Global Filipino Teachers' Readiness on Education 5.0: Reinforcing the Status Quo

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ABSTRACT

This study explores the personal attributes, technological proficiencies, and adaptive capabilities of Global Filipino Teachers (GFTs) within Education 5.0. A demographic analysis shows that most GFTs are female, aged 21-30, hold Master's degrees, and are primarily teaching at Junior High schools. The majority come from the Philippines and the United States. Technology proficiency varies, with Video Conferencing and Social Media Platforms being most familiar, while skills in Video Editing Software and AI-driven Educational Tools are considered basic, highlighting areas needing improvement. Despite various challenges, GFTs demonstrate moderate technological competency, with strong correlations between skill levels and adaptability, influenced by different challenges, barriers, and national contexts. Demographic factors such as age, gender, and educational background partially moderate these relationships. Recommendations include customized professional development, integrating technology into curricula, supporting emerging tools, fostering collaboration, considering contextual factors, and ongoing evaluation. The Department of Education in the Philippines is pivotal, supporting GFTs through professional growth initiatives, infrastructure enhancement, and policy reinforcement, aiming to boost

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their technological skills and adaptability in the evolving landscape of Education 5.0. These efforts are essential for enhancing GFTs' capacity to effectively navigate and thrive in the digital and educational advancements of the future.

Keywords: Education 5.0, Technology Skills, Pedagogical Adaptation, Digital Citizenship.

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1. INTRODUCTION

The global education landscape is undergoing a significant transformation with the advent of Education 5.0, a paradigm shift that goes beyond earlier models like teacher-centered (Education 1.0), student-centered (Education 2.0), technology-integrated (Education 3.0), and online/blended learning (Education 4.0). This new educational paradigm places a strong emphasis on personalized learning and the development of contemporary skills using cutting-edge technologies such as artificial intelligence (AI), virtual reality (VR), and big data analytics. Extensive research has explored the role of AI in customizing learning experiences and evaluating student performance, the potential of VR to create immersive learning environments, and the benefits of augmented reality (AR) in enhancing active engagement. Education 5.0 is distinguished by its learner-centric approach, which focuses on fostering critical thinking and digital literacy skills. In this evolving landscape, Filipino teachers who work across the globe play a vital role as cultural ambassadors and advocates for global competency. Despite their significant contributions, these educators face challenges such as limited access to technology and constraints within traditional curricula. Studies have examined these challenges and suggested frameworks to better prepare educators for Education 5.0, emphasizing the importance of innovation while considering cultural sensitivity and professional development. Sugandini et al. (2024) examined readiness for blended learning (RBL) by analyzing factors such as learning flexibility, basic technology skills, and attitudes toward face-to-face learning. Their study found that learning flexibility significantly impacts readiness for blended learning. Additionally, attitudes toward face-to-face learning also affect RBL. The study further revealed that readiness for blended learning influences both satisfaction and motivated strategies for learning. The contribution of this study extends beyond the Filipino education context, offering valuable insights into the broader global education industry as it adapts to Education 5.0. By addressing the challenges faced by global Filipino teachers and proposing strategies to overcome them, this research highlights the critical need for innovation in educational practices worldwide. The findings of Pizarro-Uy and Manapat (2023), which underscore the importance of human factors such as learner quality, support system quality, and instructor quality in online learning satisfaction, provide a foundation for improving educational outcomes in diverse settings. Moreover, the study by Novel, Sukmadewi, Chan, and Tresna (2022) underscores the importance of adaptability and tolerance for ambiguity as essential skills for students navigating the rapid digital transformation accelerated by the Covid-19 pandemic. Furthermore, this study contributes to the literature by offering a comprehensive understanding of the factors influencing effective online learning and the critical role of global educators in shaping the future of education. By embracing the principles of Education 5.0 and addressing the unique challenges faced by educators, we can enhance the quality of

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education and better prepare students for the demands of a rapidly evolving world.

1.1 Theoretical Framework

Education 5.0, a transformative concept in education, draws from various educational theories and frameworks (Ahmad et al., 2023; Vieira et al., 2023) to establish its core principles, including personalized learning, skill enhancement, technology integration, and global awareness. While not bound to any single theoretical framework, Education 5.0 integrates influential educational theories. Constructivism and Constructionism highlight learners' active role in knowledge construction. Constructivism, emphasized by Piaget (1954) and Vygotsky (1934), focuses on individual interpretation and social interaction in learning, while Constructionism, advocated by Papert (1980) and Kay (1972), emphasizes collaborative creation. Education 5.0 aligns with personalized learning and skill development through collaborative projects. Connectivism emphasizes learning through networks, echoed in Education 5.0's global connectivity. Experiential Learning, by Dewey (1938) and Kolb (1984), resonates with Education 5.0's hands-on approach. Andragogy, by Knowles (1973), underscores adult learners' self-directedness, reflected in Education 5.0's emphasis on skill cultivation and lifelong learning.

1.2 Objectives of the Study

This study aims to comprehensively investigate the preparedness of Global Filipino Teachers for the transformative landscape of Education 5.0, contributing to the discourse on educational innovation. It evaluates Global Filipino Teachers' readiness for Education 5.0 by examining their technological skills, adaptability to pedagogical changes, integration of essential 21st-century skills, and perceptions of challenges within Education 5.0. The specific objectives include assessing the proficiency of Global Filipino Teachers in utilizing digital tools, platforms, and technologies relevant to Education 5.0, analyzing their pedagogical adaptability, ethical and digital citizenship, technology integration, collaborative practices, and professional growth in response to educational changes, and identifying challenges and barriers faced by Global Filipino Teachers in implementing Education 5.0, such as technological limitations, curriculum constraints, and resistance to change.

1.3 Related Literature

Various studies shed light on Education 5.0, highlighting its advanced technological integration. Ydyrysbayev et al. (2022) explore digital transformation, while Pinheiro and Santos (2023) discuss its opportunities and challenges. Li et al. (2019) emphasizes technology's role in a global perspective, and Kalse et al. (2022) examine learner motivation in MOOCs. Melnychenko et al. (2021) and Alharbi (2023) further delve into technology's evolving role and implementation challenges. Ahmad et al. (2023) analyzes the readiness of Global Filipino Teachers, and Muzira and Bondai (2020) explore educators' perceptions of Education 5.0. Studies by Seeling et al. (2022) and Meter and Setiawan (2023) examine teachers' evolving roles and the broader societal context. Despite challenges like limited technology access, educators are urged to adapt to technological advancements, fostering higher order thinking skills and preparing students for Society 5.0's demands. These studies collectively inform our understanding of Global Filipino Teachers' readiness for Education 5.0. In contrast, the initial phase of education, Education 1.0, featured a teacher-centered model where students played passive roles. Sullivan (2021) advocates Emile's approach, emphasizing curiosity and hands-on learning, while Frey (2023) stresses foundational

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literacy and numeracy. Collins (2022) suggests integrating technology with traditional methods for personalized pathways, and Kovalchick (2021) promotes inquiry-based learning. Alvord (2023) proposes alternative assessments, and Adedoyin (2023) highlights challenges like unequal technology access. Despite limitations, Education 1.0 shows potential for modernization through technology integration and differentiated strategies. Education 2.0 shifts towards student-centered learning, promoting collaboration and active participation. Wilson (2023) and Smith (2022) affirm its benefits, while Garcia (2023) explores collaboration optimization. Thomas (2023) warns against uncritical tech adoption, and Ahmed (2021) stresses addressing the digital divide. Education 3.0 deeply integrates technology for personalized learning, with Cheng and Chen (2023) finding personalized approaches improve achievement. Emerging technologies like AI, VR, and AR hold promise for personalized, engaging learning experiences. Education 4.0 adopts online and blended learning, expanding accessibility and flexibility, as noted by Jones and Smith (2023) and Kim (2022). Challenges include course design and fostering interaction, addressed by Peterson (2023) and Park (2022). Emerging trends include VR, AR, AI-powered platforms, and game-based elements, enhancing engagement and personalization in online and blended settings. Education 5.0 marks a transformative shift, integrating advanced technologies like AI, VR, and big data analytics to facilitate personalized learning experiences and develop essential skills for the contemporary world.

1.3.1 Role of Global Filipino Teachers

In the realm of Education 5.0, Global Filipino Teachers play vital roles as catalysts for educational advancement (Guerrero, 2016). Originating from the Philippines, these educators travel worldwide, bringing diverse cultural backgrounds and pedagogical expertise (Vea, 2018). Their adeptness in English often positions them advantageously in global educational environments (Guariento & McCulloch, 2017). Serving as cultural ambassadors, they foster cross-cultural exchange and nurture global competence among their students (Santos & Reyes, 2019), enriching the global education community with their insights (Gonzales, 2020). In this dynamic educational landscape, a pivotal decision arises: to uphold the status quo or embrace change. Opting for the latter entails a dedication to transformative learning, technology integration, and innovative teaching in line with Education 5.0 principles. Bandojo, Uy, and Tanedo (2024) highlighted that factors such as perceived ease of use and perceived usefulness play a significant role in shaping Filipino teachers' attitudes towards adopting learning management systems (LMS). They also found a strong correlation between actual LMS usage and instructors' intention to incorporate the system into their future teaching practices. Evaluating the preparedness of Global Filipino Teachers is crucial for effectively navigating the challenges and opportunities of Education 5.0. This study aims to assess their technological proficiency, adaptation to 21st-century skills, and obstacles encountered during educational transformation, significantly contributing to discussions on educational reform and innovation. It underscores the pivotal role of Global Filipino Teachers in embracing the transformative potential of Education 5.0, thereby advancing the pursuit of quality education and global cross-cultural understanding.

2. METHODOLOGY

2.1 Research Design

The study utilized a quantitative approach to thoroughly evaluate Global Filipino Teachers' readiness for Education 5.0. This method enabled structured data collection, rigorous

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analysis, and evidence-based conclusions. Respondents, including teachers and administrators from various countries, were purposively selected from educational institutions. A structured survey instrument with four sections was employed: (1) Personal Information, gathering demographic data; (2) Technological Skills and Proficiency Assessment, evaluating participants' tech skills and readiness for innovative teaching practices; (3) Assessment of Current Practices and Approaches to Education, exploring teaching methods and alignment with Education 5.0 principles; and (4) Opinion/Perception on Challenges and Barriers, assessing respondents' views on obstacles like technological limitations or resistance to change in implementing Education 5.0..

2.2 Population and Sampling

The data was collected from 234 Global Filipino Teachers, providing a diverse and representative sample for analysis. These teachers were surveyed comprehensively, targeting various aspects of their professional backgrounds, technological competencies, and adaptability within the context of Education 5.0.

2.3 Research Instrument

The research instrument utilized in the study was a self-constructed questionnaire which consists of three (3) parts-demographic factors, and the constructs on proficiency of Global Filipino Teachers in utilizing digital tools, platforms, and technologies, Education 5.0 readiness coming from the factors of pedagogical adaptability, ethical and digital citizenship, technology integration, collaborative practices, and professional growth, and lastly, challenges and barriers faced by Global Filipino Teachers in implementing Education 5.0, such as technological limitations, curriculum constraints, and resistance to change. All items in the 3 constructs were measured using a 4-point Likert scale where 1 means “No Extent" and 4 means “To a Great Extent”. To verify the validity of the findings and credibility of the information gathered, the survey form was validated using Cronbach alpha. This validation is a process of evaluating if the survey form will answer the statement of the problem.

2.4 Statistical Treatment of Data

This study utilized various statistical methods, including descriptive, comparative, correlation, multiple regression, and path analysis, employing Partial Least Squares Structural Equation Modeling (PLS-SEM) for model analysis. PLS-SEM encompasses several statistical techniques such as regression analysis and structural equation modeling, facilitating simultaneous examination of multiple hypotheses. It is particularly beneficial for predicting dependent variables from independent ones, especially with smaller sample sizes. PLS-SEM is well-suited for models with numerous indicators and concepts, offering flexibility and not requiring normal distribution of data.

3. RESULTS

3.1 Characteristics of the Samples

The demographic profile of the respondents reveals a predominance of female teacher-respondents, constituting 62.4% of the sample, with male respondents comprising the remaining 37.6%. Within the age distribution, the largest cohort falls within the 21 to 30-year-old category, representing 31.2% of the respondents, followed closely by those aged 31 to 40 (26.9%) and 41 to 50 (26.1%). In contrast, individuals aged 51 to 60 accounted for 15% of the sample, with a negligible presence of senior teachers aged 61 and above,

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totaling 0.9%. Educational attainment among respondents indicates that a majority are college graduates (47.4%), with ongoing pursuit of master's degrees, while master's degree holders constitute 45.3% of the sample. In contrast, individuals holding Doctorate/PhD degrees represent a smaller proportion, comprising 7.3% of respondents. Regarding professional roles, the vast majority (84.6%) are actively engaged in teaching roles, with the remaining 15.4% occupying administrative, managerial, or academic head positions within their respective institutions. Years of service analysis indicates that 34.2% of respondents have served in their current institution for 16 years and above, followed by cohorts with tenures ranging from 1 to 15 years. Teaching assignments vary, with Junior High school teachers representing the largest segment (35.5%), followed by Special Education teachers (25.2%) and basic education teachers (12.4%). Conversely, Senior High school teachers, College teachers, and those affiliated with religious institutions, private tutoring centers, and English language centers constitute smaller proportions of the sample. These findings offer a comprehensive snapshot of the demographic and professional characteristics of the teacher-respondents, enriching our understanding of their composition and roles within the educational landscape.

3.1.1 Country Affiliation

Majority of the respondents are Local teachers from the Philippines accounted for 117 or 50% followed by Filipino teachers teaching in different states in the United Sates such as New York City, Texas, California, Chicago, New Mexico, Los Angeles accounted for 55 or 23.5%. There were 26 0r 11.1% Filipino teachers based in United Arab Emirates, 11 or 4.7% in Oman, 3 teachers or 1.3% in Canada, Alaska, South Korea, Cambodia and Vietnam then 2 or .9% from China, Thailand, Malaysia, and Kingdom of Bahrain. One (1) or .4% are based in Maldives and Denmark.

3.1.2 Technology Skills and Proficiency Level

Proficiency levels span from "Advanced" to "Basic." Filipino teachers excel in utilizing Video Conferencing and Webinar Platforms (x=3.57, σ=.842), closely followed by Social Media Platforms (x=3.45, σ= 1.080). Other competencies like Computers, Operating Systems, Web Browsers, Online Communication Tools, Learning Management Systems (LMS), and collaborative tools are also rated as "Proficient" (mean scores ranging from 3.00 to 3.41, σ= 1.173). Skills such as Gamification, Digital Citizenship, Content Creation Platforms, Multimedia Creation, and Personal Learning Networks (PLNs) are also proficient but with slightly lower mean scores. However, skills like Video Editing Software, AI-driven Educational Tools, MOOCs, Podcasting and Blogging Platforms, and E-portfolio Platforms are rated as "Basic," indicating lower competence. Emerging technologies like Blockchain, Remote Learning Tools, and Artificial Intelligence also fall under the "Basic" proficiency category, suggesting a need for further development. Overall, participants demonstrate an average proficiency level of x=2.56, σ= .830 across all assessed technological skills, indicating moderate competence in utilizing various technologies.

3.2 Teachers' readiness in response to the changing educational landscape

Table 1 Extent of Education 5.0 Readiness

Factor	x	SD
Overall Pedagogical adaptability	*3.30*	*.537*
Overall Ethical and Digital Citizenship	*3.20*	*.553*

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Overall Technology Integration	*3.14*	*.567*
Overall Collaborative Practices	*2.99*	*.681*
Overall Professional Growth	*3.28*	*.565*

Table 1 assesses Global Filipino Teachers' readiness to adapt to the changing educational landscape across various dimensions. The findings indicate: (1) High readiness in "Overall Pedagogical Adaptability" (mean score: 3.30, standard deviation: 0.537), showing consensus among respondents. (2) Strong commitment in "Overall Ethical and Digital Citizenship" (mean score: 3.20, standard deviation: 0.553), reflecting consistent adherence to ethical standards. (3) Commendable proficiency in "Overall Technology Integration" (mean score: 3.14, standard deviation: 0.567), indicating consistent technological proficiency. (4) Slightly lower proficiency in "Overall Collaborative Practices" (mean score: 2.99, standard deviation: 0.681), suggesting variability in collaborative practices. (5) Strong commitment to "Overall Professional Growth" (mean score: 3.28, standard deviation: 0.565), indicating a consistent desire for self-improvement. Overall, the data suggests that Global Filipino Teachers prioritize pedagogical adaptability, ethical conduct, technology integration, collaborative practices, and professional growth in response to the evolving educational landscape.

3.3 Challenges and barriers faced by Global Filipino Teachers

Table 2 Challenges and barriers faced by Global Filipino Teachers in implementing Education 5.0

Factors	x	SD
Overall Curriculum Constraints	2.84	.499
Overall Challenges on Technological Competence and Access	2.84	.639
Overall Resource Constraints	2.99	.726
Challenges on Professional Isolation	2.95	.642

Table 2 assesses the challenges encountered by Global Filipino Teachers in implementing Education 5.0. Each dimension is rated using mean scores and standard deviations, with proficiency levels ranging from "Moderately Manifested." The findings indicate: (1) Moderate challenges in "Overall Curriculum Constraints" (mean score: 2.84, standard deviation: 0.499), reflecting consensus among respondents. (2) Moderate challenges in "Overall Challenges on Technological Competence and Access" (mean score: 2.84, standard deviation: 0.639), indicating variability in technological challenges. (3) Moderate constraints in "Overall Resource Constraints" (mean score: 2.99, standard deviation: 0.726), with some variability in resource constraints. (4) Moderate challenges in "Challenges on Professional Isolation" (mean score: 2.95, standard deviation: 0.642), suggesting variability in isolation experienced. Overall, the data suggests that Global Filipino Teachers face moderate challenges, including curriculum constraints, technological competence and access, resource constraints, and professional isolation, in implementing Education 5.0. These findings underscore the need for targeted support and resources to facilitate the successful adoption of Education 5.0 practices among Global Filipino Teachers.

3.4 Model Assessment

In this study, reflective measurement was employed for all variables, assuming strong correlations between indicators and their latent variable. The questionnaire validation

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included convergent and discriminant validity tests. Reliability was assessed using Cronbach's alpha coefficient (α) and composite reliability, ensuring the questionnaire's validity and reliability for unbiased research outcomes. Convergent validity testing revealed strong interrelations among indicators, each exceeding 0.5, indicating robust convergent validity. Discriminant validity testing confirmed minimal overlap between constructs, with each indicator primarily aligning with its intended variable, supporting the questionnaire's integrity in measuring distinct constructs accurately.

Table 3 The Correlations and Average Variance Extracted of All Latent Variables

Latent Constructs	Composite reliability coefficients	Cronbach's alpha coefficients	AVE	VIFs
Technology Skills	0.964	0.960	0.585	2.060
Challenges & Barriers	0.913	0.872	.0725	1.122
Country Affiliation	1.000	1.00	1.000	1.391
Pedagogical Adaptability	0.911	0.876	0.672	3.664
Digital Citizenship	0.925	0.906	0.606	2.767
Technology Integration	0.928	0.895	0.763	3.238
Collaborative Practices	0.919	0.889	0.694	2.989
Professional Growth	0.933	0.910	0.735	1.104

*Notes: *p-value<.05, **p-value<.01, ***p-value<.001.*

Table 3 displays the reliability test, crucial for ensuring consistent scales and reliable outcomes. Two tests were conducted: Cronbach's alpha coefficient and composite reliability. Cronbach's alpha evaluates internal consistency, with a threshold of 0.70 or higher. All latent variables' alpha coefficients exceed or approach 0.80, meeting the criterion. Composite reliability, a more precise measure, also confirms internal consistency reliability in PLS analysis. Its minimum acceptable value is 0.70, with values above 0.95 indicating redundancy. In this study, all latent variables' composite reliability values range from 0.911 to 0.964, surpassing their Cronbach's alpha coefficients, affirming the model's reliability. Multicollinearity, a statistical phenomenon, was assessed using the variance inflation factor (VIF), with a threshold below 3.3 recommended. A full collinearity VIF test detected no serious concerns regarding collinearity or common method bias (CMB) in the analysis, with values ranging between 1.104 and 3.364.

Model fit indices are critical for evaluating the alignment of a research model with collected data. These metrics, essential for hypothesis testing and model selection, aid researchers in identifying the most appropriate models for their studies (Kock & Lynn, 2012). WarpPLS 8.0 offers ten key indices, including the average path coefficient (APC), average R-squared (ARS), average adjusted R-squared (AARS), average block VIF (AVIF), average full collinearity VIF (AFVIF), Tenenhaus GoF (GoF), Simpson's paradox ratio (SPR), R-squared contribution ratio (RSCR), statistical suppression ratio (SSR), and nonlinear bivariate causality direction ratio (NLBCDR) (Kock, 2017a). The APC evaluates path strengths in the model, with a recommended significance level of $p < 0.05$ (Kock, 2011). In this study, the APC of 0.499 (Figure 1 and Table 4) indicates a significant relationship between technology skills and Education 5.0 readiness. The ARS measures model explanatory power, with a suggested p-value threshold of 0.05 (Kock, 2011). The ARS result of 0.282 (Figure 1 & Table 4), significant at $p < 0.001$, suggests technology skills explain 28.2% of Education 5.0 readiness variance. The AARS, adjusting for non-informative predictors, also confirms a significant relationship ($p < 0.001$, AARS = 0.279).

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Table 4 Model 1 Fit Indices (Tech skills & Educ 5.0 Readiness)

Model Fit Indices	**Coefficient**	**Result**
Average path coefficient (APC)	0.499***	Significant
Average R-squared (ARS)	0.282***	Significant
Average adjusted R-squared (AARS)	0.279***	Significant
Average block VIF (AVIF)		Not Available
Average full collinearity VIF (FVIF)	2.567	Ideally
Tenenhaus GoF (GoF)	0.439	Large
Simpson's paradox ratio (SPR)	1.000	Ideally
R-squared contribution ratio (RSCR)	1.000	Ideally
Statistical suppression ratio (SSR)	1.000	Acceptable
Nonlinear bivariate causality direction ratio (NLBCDR)	1.000	Acceptable

*Note: ***, **, * means significant at 0.001, 0.01, 0.05 level*

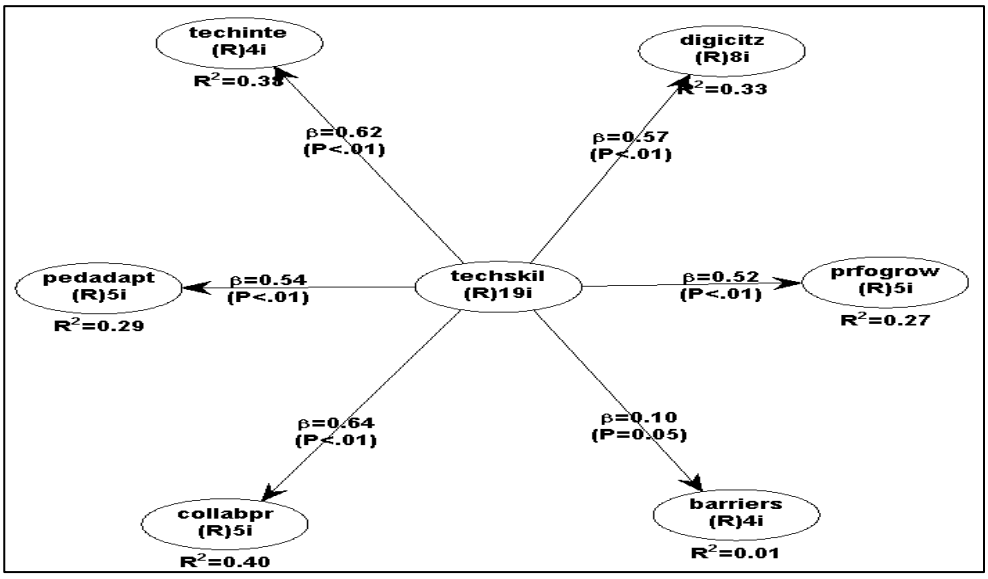

Figure 1. Conceptual Model of Technology Skills and Education 5.0 Readiness (Model 1)

The fit indices presented in Table 5 provide a comprehensive evaluation of Model 2, incorporating both mediating and moderating effects. In this model, Technology Skills serve as the independent variable, influencing Education 5.0 readiness as the dependent variable. Barriers and Country Affiliation act as mediators, shaping the relationship between Technology Skills and Education 5.0 readiness. Demographic factors such as School Affiliation, Job Role, Educational Background, Years of Service, Age, and Gender are considered moderating variables, potentially affecting this relationship. The significant average path coefficient (APC = 0.132, p = 0.010) suggests meaningful relationships between the model's variables. The average R-squared (ARS = 0.158, p = 0.003) and average adjusted R-squared (AARS = 0.147, p = 0.005) indicate that the model significantly explains the variance in the dependent variables. Both the average block VIF (AVIF = 1.682) and average

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full collinearity VIF (AFVIF = 1.711) are below the threshold of 3.3, indicating minimal multicollinearity concerns. The Tenenhaus GoF (GoF = 0.385) suggests a good model fit. However, the Simpson's paradox ratio (SPR = 0.636) and nonlinear bivariate causality direction ratio (NLBCDR = 0.682) are not acceptable, highlighting potential data aggregation issues and unaccounted non-linear causal effects. The R-squared contribution ratio (RSCR = 0.917) and statistical suppression ratio (SSR = 1.000) are acceptable, indicating clear and interpretable relationships. In conclusion, while Model 2 demonstrates strong explanatory power and minimal multicollinearity issues, attention should be given to addressing the identified non-linearities and potential aggregation problems to enhance the model's robustness and interpretability.

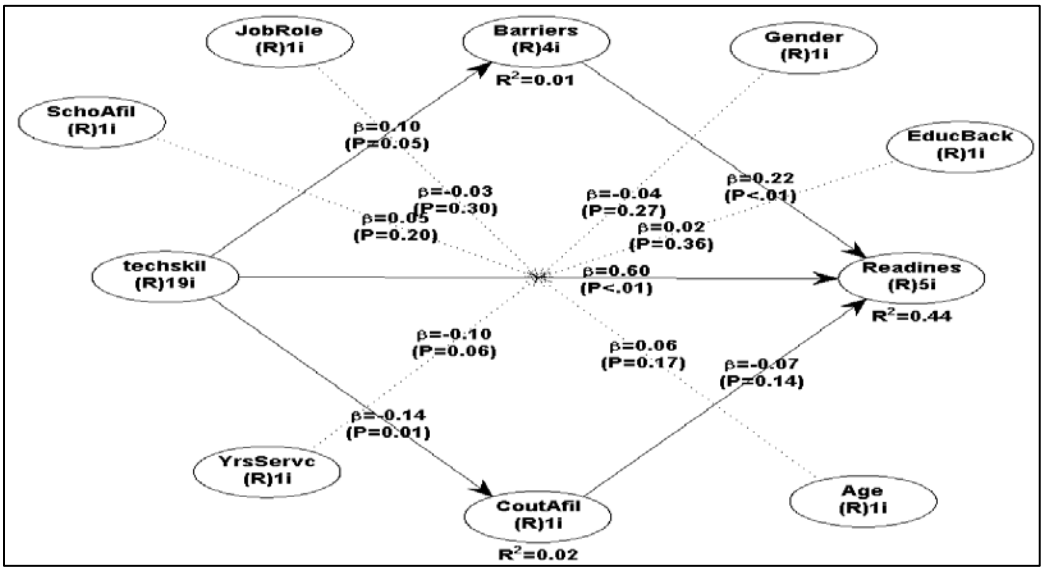

Figure 2. Conceptual Model of Barriers, Country Affiliation as Mediators, and demographics as Moderators between Technology Skills and Education 5.0 Readiness (Model 2)

Table 5. Model 2 Fit Indices with mediating and Moderating Effect

Model Fit Indices	**Coefficient**	**p-values**	**Result**
Average path coefficient (APC)	0.132**	0.010	Significant
Average R-squared (ARS)	0.158***	0.003	Significant
Average adjusted R-squared (AARS)	0.147***	0.005	Significant
Average block VIF (AVIF)	1.682		Ideally
Average full collinearity VIF (FVIF)	1.711		Ideally
Tenenhaus GoF (GoF)	0.385		Large
Simpson's paradox ratio (SPR)	0.636		Not Acceptable
R-squared contribution ratio (RSCR)	.917		Acceptable
Statistical suppression ratio (SSR)	1.000		Acceptable
Nonlinear bivariate causality direction ratio (NLBCDR)	0.682		Not Acceptable

*Note: ***, **, * means significant at 0.001, 0.01, 0.05 level*

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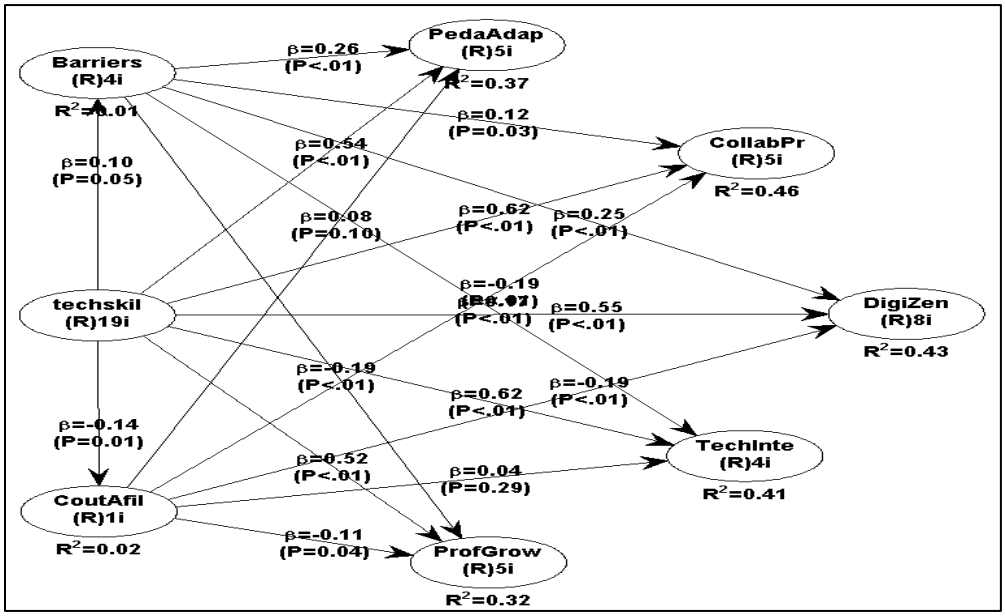

Figure 3. Conceptual Model of Barriers, Country Affiliation as Mediators between Technology Skills, and Education 5.0 Readiness Parameters (Model 3)

Table 6. Model 3 Fit Indices with Mediating Effect (Barriers & Country Affiliation as Mediators between Technology Skills and Educ 5.0 Predictors)

Model Fit Indices	**Coefficient**	**Result**
Average path coefficient (APC)	0.276***	Significant
Average R-squared (ARS)	0.290***	Significant
Average adjusted R-squared (AARS)	0.284***	Significant
Average block VIF (AVIF)	1.009	Ideally
Average full collinearity VIF (FVIF)	2.495	Ideally
Tenenhaus GoF (GoF)	0.458	Large
Simpson's paradox ratio (SPR)	1.000	Ideally
R-squared contribution ratio (RSCR)	1.000	Ideally
Statistical suppression ratio (SSR)	1.000	Acceptable
Nonlinear bivariate causality direction ratio (NLBCDR)	0.794	Acceptable

*Note: ***, **, * means significant at 0.001, 0.01, 0.05 level*

The findings from Figure 3 & Table 6 (Model 3) present model fit indices for Model 2, examining the relationship between Technology Skills (independent variable) and Education 5.0 Readiness Predictors (dependent variables), with Barriers and Country Affiliation acting as mediators. The results illustrate how Barriers and Country Affiliation shape the connection between Technology Skills and various dimensions of Education 5.0 Readiness, including Pedagogical Adaptability, Ethical and Digital Citizenship, Technology Integration, Collaborative Practices, and Professional Growth. A significant Average Path Coefficient (APC) of 0.276 highlights a meaningful association between Technology Skills and Education 5.0 Readiness Predictors, indicating that improvements in Technology Skills coincide with enhancements in these dimensions, mediated by Barriers and Country Affiliation. The statistically significant Average R-squared (ARS) and Average Adjusted R-squared (AARS) values of 0.290 and 0.284 respectively suggest that approximately 29% of

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the variability in Education 5.0 Readiness Predictors can be explained by the model, reflecting strong predictive capability. Acceptable Average Block VIF (AVIF) and Average Full Collinearity VIF (FVIF) values indicate minimal multicollinearity among independent variables. Furthermore, robust values for Tenenhaus GoF (GoF), Simpson's Paradox Ratio (SPR), R-squared Contribution Ratio (RSCR), Statistical Suppression Ratio (SSR), and Nonlinear Bivariate Causality Direction Ratio (NLBCDR) affirm the model's reliability, demonstrating substantial explanatory power, absence of Simpson's paradox, no statistical suppression, and appropriate causality direction. In summary, Barriers and Country Affiliation play pivotal roles as mediators influencing the relationship between Technology Skills and Education 5.0 Readiness dimensions, underscoring the model's effectiveness in understanding factors that affect Education 5.0 Readiness in this context.

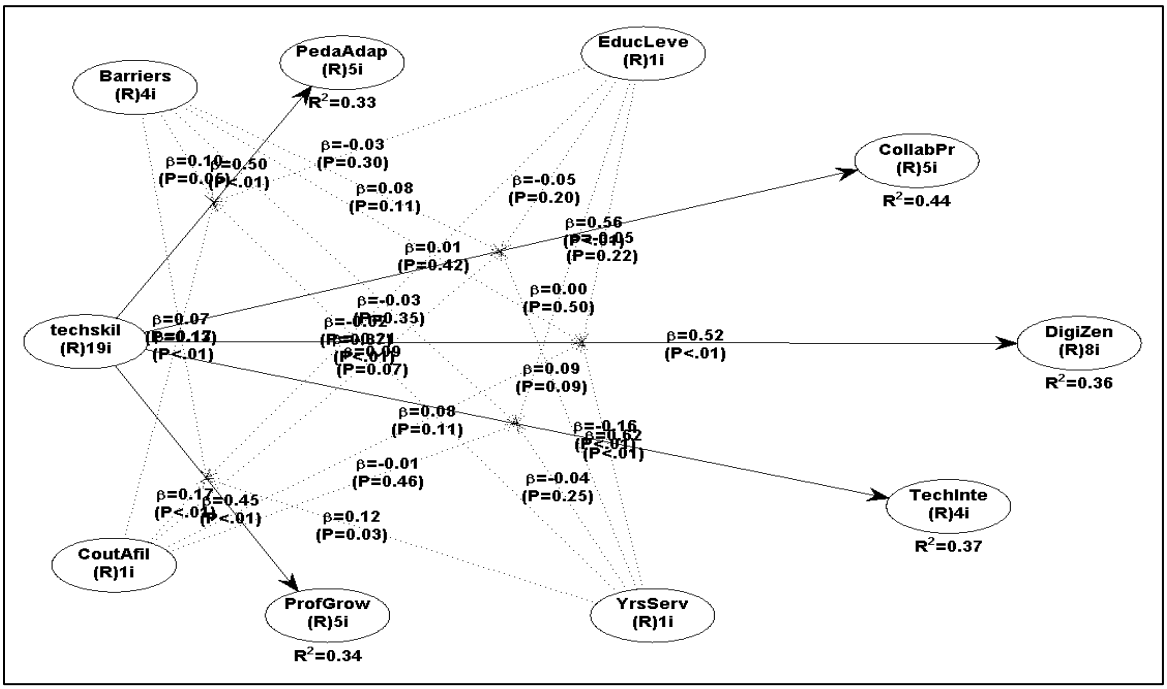

Figure 4. Conceptual Model of Barriers, Country Affiliation demographics as Moderators between Technology Skills and Education 5.0 Readiness Parameters (Model 4)

Table 7. Model 4 Fit Indices with Moderating Effect (Barriers & Country Affiliation on Tec Skill and Educ 5.0 variables)

Model Fit Indices	**Coefficient**	**Result**
Average path coefficient (APC)	0.170***	Significant
Average R-squared (ARS)	0.368***	Significant
Average adjusted R-squared (AARS)	0.354***	Significant
Average block VIF (AVIF)	1.133	Ideally
Average full collinearity VIF (FVIF)	2.015	Ideally
Tenenhaus GoF (GoF)	0.556	Large
Simpson's paradox ratio (SPR)	0.800	Acceptable
R-squared contribution ratio (RSCR)	0.989	Acceptable
Statistical suppression ratio (SSR)	1.000	Acceptable
Nonlinear bivariate causality direction ratio (NLBCDR)	0.680	Acceptable

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*Note: ***, **, * means significant at 0.001, 0.01, 0.05 level*

The results depicted in Figure 4 and Table 7 (Model 4) elucidate Model 4, which explores the relationship between Technology Skills (independent variable) and Education 5.0 Readiness Predictors (dependent variables), with Barriers and Country Affiliation acting as moderators. Additionally, Education Level and Educational Background are considered as additional moderators. The dependent variables encompass Pedagogical Adaptability, Ethical and Digital Citizenship, Technology Integration, Collaborative Practices, and Professional Growth. A significant APC value of 0.170 underscores a meaningful association between Technology Skills and Education 5.0 Readiness Predictors, indicating that improvements in Technology Skills are linked to enhancements across various facets of Education 5.0 Readiness, moderated by Barriers, Country Affiliation, Education Level, and Educational Background. Statistically significant ARS and AARS values of 0.368 and 0.354 respectively suggest that approximately 36.8% of the variability in Education 5.0 Readiness Predictors can be explained by Technology Skills and its moderators, indicating robust predictive capability. Acceptable AVIF (1.133) and FVIF (2.015) values indicate minimal multicollinearity among independent variables, highlighting balanced and non-redundant relationships. The substantial GoF value (0.556) underscores significant explanatory power in understanding Education 5.0 Readiness. An acceptable SPR value (0.800) indicates few instances of Simpson's paradox, signifying a stable causal relationship among variables. The RSCR (0.989), SSR (1.000), and NLBCDR (0.680) values affirm accurate representation of relationships, with positive contributions, no statistical suppression issues, and minimal indications of reverse hypothesized causality, respectively. These findings collectively indicate that Barriers, Country Affiliation, Education Level, and Educational Background collectively moderate the relationship between Technology Skills and various dimensions of Education 5.0 Readiness, providing insightful perspectives on influencing factors in this domain.

Test of Hypotheses

Thirteen hypotheses proposing linear relationships are depicted in Figures 1, 2, 3, and 4 of this study. The subsequent section discusses the outcomes of the PLS-SEM analysis. Path analysis clarifies the strength of connections between variables, using the beta coefficient (β) to explain the path coefficient in regression analysis. A positive beta coefficient indicates a positive relationship, while a negative one implies a negative relationship. The p-value evaluates significance, typically using a threshold of 0.05. A p-value below 0.05 signifies statistical significance, while exceeding 0.05 indicates insignificance. The coefficient of determination, or r-squared coefficient, reveals the proportion of variance in a dependent variable explained by independent variable(s), with higher values indicating greater predictive power. Bootstrapping resampling analysis was used for model estimation, generating confidence intervals for parameter estimates, with 100 resamples recommended for accuracy. The findings from the PLS-SEM analysis are summarized in Figure 4.

Hypothesis 1: High levels of Technology Skill Proficiency among Global Filipino Teachers correlate positively with Pedagogical Adaptability in response to the evolving educational landscape (Education 5.0). The results from Figure 1, Model 1, indicate a significant positive correlation (β=0.54; p=.01), supporting hypothesis 1.

Hypothesis 2: Increased Technology Skill Proficiency among Global Filipino Teachers positively influences Ethical and Digital Citizenship in response to the changing

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educational landscape (Education 5.0). The analysis in Figure 1, Model 1, demonstrates a statistically significant positive correlation (β=0.57; p<.01), confirming hypothesis 2.

Hypothesis 3: Higher levels of Technology Skill Proficiency among Global Filipino Teachers negatively correlate with Technology Integration in the educational setting (Education 5.0). The findings from Figure 1, Model 1, reveal a significant negative correlation (β=0.62; p<.01), supporting hypothesis 3.

Hypothesis 4: Elevated levels of Technology Skill Proficiency among Global Filipino Teachers enhance Collaborative Practices in response to the changing educational landscape (Education 5.0). The results in Figure 1, Model 1, indicate a significant positive correlation (β=0.64; p<.01), confirming hypothesis 4.

Hypothesis 5: Enhanced levels of Technology Skill Proficiency among Global Filipino Teachers positively impact Professional Growth in response to the evolving educational landscape (Education 5.0). The analysis in Figure 1, Model 1, demonstrates a significant positive correlation (β=0.54; p<.01), supporting hypothesis 5.

The mediating effect reveals an indirect causal link between an independent variable and an outcome variable, mediated by an intermediary called a mediator. This effect may be full or partial, offering deeper insights into causal relationships. In PLS-SEM, testing the mediating effect utilizes the method by Preacher and Hayes (2004), assessing significance and estimating indirect effects using standard errors for path coefficients. The PLS-SEM automatically generates path coefficients and P-values when evaluating the significance of the proposed mediator (Kock, 2014**).**

Table 8 Mediating effects of Challenges & Barriers into Technology Skills and Education 5.0 Readiness

Paths	Beta coefficient	P value	Type of mediation
TechSkills→ C&B→ Educ5.0-Readiness	-.205	<.001	Partial
TechSkills→ C&B→ Pedagogical Adaptability	.212	<.001	Partial
TechSkills→ C&B→ Ethical/Digital Citizenship	.273	<.001	Partial
TechSkills→ C&B→ Technology Integration	-.174	<.001	Partial
TechSkills→ C&B→ Collaborative Practices	.171	<.001	Partial
TechSkills→ C&B→ Professional Growth	.222	<.001	Partial
TechSkills→CountryAffil→ Educ5.0-Readiness	-.205	<.001	Partial
TechSkills→ CountryAffil → Pedagogical Adaptability	.212	<.001	Partial
TechSkills→ CountryAffil → Ethical/Digital Citizenship	.273	<.001	Partial
TechSkills→ CountryAffil → Technology Integration	-.174	<.001	Partial
TechSkills→ CountryAffil → Collaborative Practices	.171	<.001	Partial
TechSkills→ CountryAffil → Professional Growth	.222	<.001	Partial

Note: TechSkills=Technology Skills, C&B=Challenges and Barriers, CountryAfil=Country Affiliation

Hypothesis 6: Challenges and Barriers mediate the relationship between Technology Skill Proficiency and Education 5.0 Readiness. Model 3 (Figure 3 & Table 8) illustrates this sequential relationship, showing a negative association (β=-0.205; p<.001) between Technology Skills and Challenges & Barriers, which partially mediate the link to Education 5.0 Readiness, supporting hypothesis 6.

Hypothesis 6a: Challenges and Barriers mediate the relationship between Technology Skill Proficiency and Pedagogical Adaptability. In Model 3 (Figure 3 & Table 12), a significant

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positive relationship (β=0.212; p<.001) exists between Technology Skills and Pedagogical Adaptability through Challenges & Barriers, affirming hypothesis 6a.

Hypothesis 6b: Challenges and Barriers mediate the relationship between Technology Skill Proficiency and Ethical/Digital Citizenship. Model 3 (Figure 3 & Table 8) shows a significant positive correlation (β=0.273; p<.001) between Technology Skills and Ethical/Digital Citizenship via Challenges & Barriers, supporting hypothesis 6b.

Hypothesis 6c: Challenges and Barriers mediate the relationship between Technology Skill Proficiency and Technology Integration. Model 3 (Figure 3 & Table 8) reveals a negative association (β=-0.174; p<.001) between Technology Skills and Technology Integration through Challenges & Barriers, confirming hypothesis 6c.

Hypothesis 6d: Challenges and Barriers mediate the relationship between Technology Skill Proficiency and Collaborative Practices. Model 3 (Figure 3 & Table 8) indicates a positive correlation (β=0.171; p<.001) between Technology Skills and Collaborative Practices mediated by Challenges & Barriers, supporting hypothesis 6d.

Hypothesis 6e: Challenges and Barriers mediate the relationship between Technology Skill Proficiency and Professional Growth. In Model 3 (Figure 3 & Table 8), a positive correlation (β=0.222; p<.001) between Technology Skills and Professional Growth is mediated by Challenges & Barriers, confirming hypothesis 6e.

Hypothesis 7: Country Teaching Affiliation mediates the relationship between Technology Skill Proficiency and Education 5.0 Readiness. A negative association (β=-0.205; p<.001) exists between Technology Skills and Education 5.0 Readiness mediated by Country Affiliation, partially explaining the link, thus validating hypothesis 7.

Hypothesis 7a: Country Teaching Affiliation mediates the relationship between Technology Skill Proficiency and Pedagogical Adaptability. Model 3 (Figure 3 & Table 8) reveals a positive correlation (β=0.212; p<.001) between Technology Skills and Pedagogical Adaptability mediated by Country Affiliation, supporting hypothesis 7a.

Hypothesis 7b: Country Teaching Affiliation mediates the relationship between Technology Skill Proficiency and Ethical/Digital Citizenship. A positive correlation (β=0.273; p<.001) exists between Technology Skills and Ethical/Digital Citizenship through Country Affiliation, confirming hypothesis 7b.

Hypothesis 7c: Country Teaching Affiliation mediates the relationship between Technology Skill Proficiency and Technology Integration. Model 3 (Figure 3 & Table 8) indicates a negative association (β=-0.174; p<.001) between Technology Skills and Technology Integration mediated by Country Affiliation, validating hypothesis 7c.

Hypothesis 7d: Country Teaching Affiliation mediates the relationship between Technology Skill Proficiency and Collaborative Practices. A positive correlation (β=0.171; p<.001) exists between Technology Skills and Collaborative Practices through Country Affiliation, supporting hypothesis 7d.

Hypothesis 7e: Country Teaching Affiliation mediates the relationship between Technology Skill Proficiency and Professional Growth. Model 3 (Figure 3 & Table 8) reveals a positive correlation (β=0.222; p<.001) between Technology Skills and Professional Growth mediated by Country Affiliation, confirming hypothesis 7e.

Table 9. Moderating effects

Paths	Beta coefficient	P value	Type of mediation
TechSkills→ Educ5.0-Readiness *moderated* by Age	0.06	0.017	Partial
TechSkills→ Pedagogical Adaptability *moderated* by Gender	0.04	0.27	Partial

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TechSkills→ Ethical/Digital Citizenship *moderated* by EducBack	0.02	0.36	Partial
TechSkills→ Technology Integration *moderated* by JobRole	0.03	0.30	Partial
TechSkills→ Collaborative Practices *moderated* by YrsServc	0.10	0.06	Partial
TechSkills→ Professional Growth *moderated* by SchoolAffil	0.05	0.20	Partial

Note: TechSkills=Technology Skills, C&B=Challenges and Barriers, CountryAfil=Country Affiliation

Hypothesis 8: Age moderates the relationship between Technology Skill Proficiency and Education 5.0 Readiness. In Model 4 (Figure 4 & Table 9), the interaction reveals a statistically significant positive relationship (β=0.06; p=0.017), indicating that as individuals' ages increase, the impact of Technology Skills on Education 5.0 Readiness also increases. This partial moderation supports hypothesis 8.

Hypothesis 9: Gender moderates the relationship between Technology Skill Proficiency and Education 5.0 Readiness. Model 4 (Figure 4 & Table 9) shows no statistically significant relationship (β=0.04; p=0.27) between Technology Skills and Education 5.0 Readiness moderated by Gender. While Gender may have some influence on Pedagogical Adaptability, other factors also contribute, supporting hypothesis 9.

Hypothesis 10: Job Roles moderate the relationship between Technology Skill Proficiency and Education 5.0 Readiness. Model 4 (Figure 4 & Table 9) indicates no statistically significant association (β=0.03; p=0.30) between Technology Skills and Technology Integration moderated by Job Role, supporting hypothesis 10.

Hypothesis 11: School Type Affiliation moderates the relationship between Technology Skill Proficiency and Education 5.0 Readiness. Model 4 (Figure 4 & Table 9) shows no statistically significant relationship (β=0.05; p=0.20) between Technology Skills and Professional Growth moderated by School Affiliation, supporting hypothesis 11.

Hypothesis 12: Educational Background moderates the relationship between Technology Skill Proficiency and Education 5.0 Readiness. Model 4 (Figure 4 & Table 9) reveals no statistically significant association (β=0.02; p=0.36) between Technology Skills & Ethical/Digital Citizenship moderated by Educational Background, supporting hypothesis 12.

Hypothesis 13: Years of Teaching Service moderate the relationship between Technology Skill Proficiency and Education 5.0 Readiness. Model 4 (Figure 4 & Table 9) suggests a partially significant association (β=0.10; p=0.06) between Technology Skills and Collaborative Practices moderated by Years of Service, supporting hypothesis 13**.**

4. CONCLUSION

The contribution of this study extends beyond the Filipino education context, offering valuable insights into the broader global education industry as it adapts to Education 5.0. By addressing the challenges faced by global Filipino teachers and proposing strategies to overcome them, this research highlights the critical need for innovation in educational practices worldwide. Analysis of respondent demographics reveals a predominance of female teachers, with most aged between 21 to 30 years, followed by 31 to 40 and 41 to 50 age groups, while seniors aged 61 and above are minimal. College degree holders form a significant proportion, followed by master's degree holders, with Doctorate/PhD degree holders being the smallest group. The majority are actively teaching, with fewer in administrative roles. In terms of years of service, a significant portion have 16 years and above, and teaching assignments are mostly in Junior High schools. Filipino teachers

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dominate, followed by those in the United States, United Arab Emirates, and Oman, among others. In terms of technology skills, proficiency is highest in video conferencing and social media platforms, with room for improvement in emerging technologies like Blockchain and artificial intelligence. Participants exhibit moderate competence overall. Hypotheses suggest a positive correlation between technology skill proficiency and educational adaptation, with challenges, barriers, and country affiliation playing partial mediating roles. Moderation effects of demographic and professional factors indicate partial influence on the relationship, suggesting the involvement of other variables in shaping dynamics between technology skill proficiency and educational adaptation. These findings stress the importance of considering individual and contextual factors in fostering effective technology integration and pedagogical adaptation. In conclusion, this study contributes to the literature by offering a comprehensive understanding of the factors influencing effective online learning and the critical role of global educators in shaping the future of education. By embracing the principles of Education 5.0 and addressing the unique challenges faced by educators, we can enhance the quality of education and better prepare students for the demands of a rapidly evolving world. The insights provided can inform policymakers and educational leaders globally, promoting the adoption of innovative practices and supporting teachers in their crucial role as facilitators of modern education.

5. RECOMMENDATIONS

Based on the analysis, recommendations include enhancing targeted professional development programs to improve teachers' technological skills, especially in areas rated as "Basic" proficiency. These programs should provide hands-on training, workshops, and continuous support to ensure teachers feel confident in utilizing various technologies effectively. Additionally, integrating technology-enhanced learning into the curriculum can promote active engagement and personalized learning experiences for students, facilitated by providing resources and guidelines for seamless integration across different subjects and grade levels. Exploring and experimenting with emerging technologies like Blockchain, Remote Learning Tools, and Artificial Intelligence is crucial, along with fostering collaboration among teachers to share best practices for adopting innovative technologies.

On the other hand, addressing challenges that hinder effective technology use in education is paramount. Strategies should be developed to mitigate these challenges, including providing access to necessary resources, addressing infrastructure limitations, and offering ongoing technical support and training. Cultivating a collaborative culture among teachers through platforms like professional learning communities can facilitate knowledge sharing and support. Recognizing the diverse contexts in which teachers operate and tailoring interventions to meet specific needs is essential, alongside implementing mechanisms for continuous evaluation and improvement of technology integration efforts. Feedback from stakeholders should be collected to refine strategies and ensure responsiveness to evolving needs. At the local level, the Department of Education (DepEd) in the Philippines plays a crucial role in supporting Filipino teachers. DepEd should initiate and fund professional development programs tailored to enhance teachers' technological skills, offering comprehensive training on relevant tools and platforms. Guidance and resources should be provided to schools and teachers on effective technology integration into the curriculum, with a focus on infrastructure development and fostering a supportive environment for teachers. Continuous research studies and evaluations are necessary to assess the impact of technology

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integration initiatives and guide future policy decisions. Clear policies and guidelines should be developed to promote effective technology use in education, and advocacy for increased funding and support for technology integration efforts is essential. Finally, ongoing support and professional development opportunities should be provided for teachers to ensure they remain updated with emerging technologies and pedagogical practices. These recommendations aim to support Global Filipino Teachers in adapting to the changing educational landscape represented by Education 5.0.

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