Cite Us
Vol. VIII, No. II (Spring 2023) Pages: 632 – 644 DOI: 10.31703/gesr.2023(VIII-II).57

Citation: Naqvi, S. A. H., & iqbal, M Z. (2023). Impact of ICT Proficiency on Teachers' Work Performance in Distance Learning. *Global Educational Studies Review,* VIII(II), 644-656. https://doi.org/10.31703/gesr.2023(VIII-II).57

Global Educational Studies Review GESR

Impact of ICT Proficiency on Teachers' Work Performance in Distance Learning

Syed Alamdar Hasnain Naqvi* Muhammad Zafar Iqbal†

Corresponding Author: Syed Alamdar Hasnain Naqvi (Ph.D. Scholar, EPPSL Department, Allama Iqbal Open University, Islamabad, Pakistan.
Email: alamdar@gmail.com)

Abstract: *This study investigated the impact of Information and Communication Technology Proficiency (ICT-P) on teachers' work performance (WP) within distance learning contexts. Employing a quantitative design, a cross-sectional survey was administered to assess the ICT-P and WP of teachers working in distance learning institutes; Virtual University and Allama Iqbal Open University. Using stratified sampling, data was collected from 237 teachers through two online self-administered questionnaires, involving ICT-P and WP. Both questionnaires consist of a 6-point semantic differential scale. The ICT-P was framed around the Joint Information Systems Committee (JISC) model of digital literacy, examining constructs such as the use of ICT-P based devices, digital applications, software, services, and digital proficiency. The WP construct, sourced from an extensive literature review, is divided into seven primary areas. Data was analysed using descriptive statistics, reliability analysis, correlation, and regression techniques. The research found an affirmative impact of ICT Proficiency on teachers' work performance.*

Key Words: Information and Communication Technology Proficiency, Distance Learning, Work Performance, Digital Literacy

Introduction

The significance of Information and Communication Technology (ICT) in the ever-changing environment of education has become vital, leading to a move from traditional classroom settings to digital platforms, particularly in distant learning contexts (Smith & Anderson, 2018). Within this digital transformation, teacher ability to use ICT resources has a substantial impact on the performance and efficacy of teaching (Harris, Mishra, & Koehler, 2009).

The rapid transition to distance learning, generated by global crises such as the COVID-19 epidemic, has made it critical to investigate how ICT-P affects instructors' WP (Johnson, Adams Becker, Estrada, & Freeman, 2020). Previous study has demonstrated that digital literacy, which includes skills ranging from fundamental digital tool usage to more complicated abilities such as online content creation, has a significant impact on teachers' ability to impart knowledge (Jones, 2017). However, there is still a gap in knowing how various parts of digital literacy correlate and impact diverse WP components such as the

*Ph.D. Scholar, EPPSL Department, Allama Iqbal Open University, Islamabad, Pakistan.
†Assistant Professor. EPPSL Department, Allama Iqbal Open University, Islamabad, Pakistan.

Teaching-Learning Process, Innovative practices, Communication, and others in the distance learning system of education.

This study aims to bridge this gap, centring on two major distance learning educational institutions, the Virtual University and Allama Iqbal Open University. Drawing from the Joint Information Systems Committee (JISC) model of digital literacy (JISC, 2014), this research explores the nuances of ICT-P. Simultaneously, it dissects the multifaceted construct of WP, grounded in an extensive review of the relevant literature (Rajendra, 2014; McQuerrey, 2018; Koopmans et al., 2011).

Understanding the dynamics between ICT-P and WP can offer valuable insights to policymakers, educational leaders, and curriculum developers. As distance learning continues to grow in prevalence, it is paramount that educators are not only equipped with the necessary digital tools but are proficient in leveraging them to enhance their pedagogical delivery (Anderson & Dron, 2011).

Numerous studies have been conducted over the last few decades to examine the impact of information and communication technology (ICT) on education, particularly remote learning. ICT's critical role in improving classroom quality, streamlining administrative operations, and facilitating research has been widely recognised (Peterson &Wright, 2017).

Evolution and Integration of ICT in Education

Historically, ICT was viewed as a supplement to traditional educational methods. According to Bates (2005), the early 1990s inaugurated a period of multimedia applications in schools, while the late 1990s saw the integration of the Internet. By the turn of the century, digital tools and resources had become more interactive, allowing students to take a more active role in their education (Anderson & Williams 2013). In the last decade, there has been exponential growth in digital platforms and tools customized for education, with artificial intelligence, augmented reality, and virtual reality becoming more commonplace (Bates, 2005).

ICT Proficiency and its Significance

Digital literacy and ICT-P have been shown to impact not only students' learning outcomes but also teachers' ability to deliver content effectively. According to Mishra and Koehler (2006), teachers' Technological Pedagogical Content Knowledge (TPACK) is crucial for meaningful technology integration in teaching. This means that it's not enough for teachers to be technologically proficient; they must also recognise how their ICT tools can be effectively merged with pedagogical techniques to benefit their specific content areas.

WP in the Context of Distance Learning

In distance learning, WP is a comprehensive construct, involving aspects such as teaching quality, innovative practices, and effective communication (Moore et. al, 2011). Research by Anderson and Dron (2011) emphasizes the need for teachers in distance education to adapt their teaching techniques according to the medium and audience. Factors like timely feedback, prompt communication, and utilization of diverse resources have been shown to influence learners' satisfaction and outcomes in distance education (Moore & Kearsley, 2012).

The Nexus between ICT Proficiency and WP

While there is ample evidence on the individual influences of ICT-P and WP, literature specifically exploring their interrelation is relatively nascent. Some studies suggest that higher ICT-P among educators leads to enhanced WP, particularly in online and distance learning contexts (Mishra & Koehler, 2006). However, challenges such as resistance to technology adoption and the digital divide among educators cannot be ignored (Beaudoin, 2015).

Objectives

The objectives of the study are to:

1. Investigate the level of Information and Communication Technology Proficiency (ICT-P) of teachers in distance learning.
2. Explore the teacher's work performance (WP) in distance learning.
3. Find the impact of Information and Communication Technology Proficiency (ICT-P) on Teacher's Work performance (WP)

Theoretical Framework

This study relies on an elaborate theoretical framework, centralizing on the evaluation of Teachers' WP in the context of distance learning. Anchored in literature, this framework encompasses various sub-constructs important for comprehending the interplay between ICT-P and WP in the distance education system. This theoretical framework, which is based on innovative research, offers a solid framework for analyzing the specifics of Teachers' WP in distance learning. It not only provides clarity on individual constructs but also makes it easier to comprehend how they relate and impact each other, particularly in the context of ICT-P.

Teachers' WP

1. Teachers' WP in distance education necessitates a multi-dimensional lens, as it is influenced by an array of constructs.
2. Teaching Learning Process (Rajendra, 2014): Intact to the broader educational framework, this focuses on the effective deployment of ICT tools, diversity in learning materials, and delivery methodologies. Rajendra (2014) suggests that an effective teaching-learning process in digital realms necessitates adeptness in using ICT, providing varied learning material, and optimizing lecture delivery for diverse learners.
3. Innovative Practices (Rajendra, 2014): With the increasing digitalization of education, it's fundamental for teachers to teach innovative practices. Rajendra underscores the importance of fostering inclusive educational practices, participating in innovative teaching-learning strategies, emphasizing value-based education, implementing internal quality checks, and maintaining strong stakeholder relationships.
4. Teacher Quality (Rajendra, 2014): Quality of teaching isn't only condensed by the content delivered but also by a teacher's commitment to continuous learning and research. As per Rajendra's findings, teachers' quality is discerned by their involvement in research, academic publications, and the frequency and quality of training received.
5. Communication (McQuerrey, 2018): McQuerrey (2018) emphasizes the indispensable nature of clear, concise communication in distance education. Effective communication isn't just about content delivery, but also responsiveness, timely feedback, and the ability to lucidly articulate concepts.
6. Task Performance (Koopmans et al., 2011): In their seminal study, Koopmans et al. delineate task performance in terms of the quantity and quality of work, the depth of job knowledge, and the efficiency in task completion.
7. Learning Resources (Rajendra, 2014): The pedagogical efficacy in distance learning is significantly hinged on the use and provision of optimal learning resources. Utilizing e-libraries, providing e-learning materials, and constantly upgrading professional competence are crucial, as highlighted by Rajendra.
8. Job Functions (McQuerrey, 2018): McQuerrey elucidates that job functions in distance education are marked by timeliness, creativity, innovation, effective time management, consistency, and proactive initiatives.

Digital Literacy Tool Framework

Anchored in the JISC Model (2014), this study examines the intricacies of ICT-P, which is essential for understanding its impact on teachers' WP in distance learning settings.

ICT-P (Jisc, 2014): The JISC model emphasizes the comprehensive nature of digital literacy. Beyond just using ICT-based devices, it underscores the importance of leveraging digital applications, software, services, and overall digital proficiency and productivity. The model offers a holistic view of digital literacy, helping educators navigate and integrate ICT tools effectively.

Methodology:

This section provides a detailed description of the research design, methods, and procedures employed in the study to collect and analyse data regarding the impact of ICT-P on teachers' WP in distance learning.

Research Design:

The study adopted a quantitative research design with a cross-sectional survey approach. This design was chosen as it allowed for the collection of data from a large sample of teachers at a single point in time, providing a snapshot of their ICT-P levels and WP in distance learning environments.

Population

The participants of the study consisted of teachers involved in distance learning across two educational institutions i.e., Virtual University and Allama Iqbal Open University. A stratified random sampling technique was used to select participants who had experience in teaching in online environments. A total of 350 (50%) teachers were invited to participate in the study, and 237 responses were received.

Data Collection:

Data were collected using two self-administered online questionnaires on digital literacy and WP, the questionnaire contained items designed to measure teachers' ICT-P and WP in distance learning.

The ICT-P scale included items measuring ICT-P. Each construct was measured using a 6-point semantic difference scale, using two ends strong.

The WP scale included items assessing the following seven constructs: Teaching-Learning Process, Innovative Practices, Teacher Quality, Communication, Task Performance, Learning Resources, and Job Functions. These items were also measured using a 6-point semantic differential scale, using two ends, good-bad.

Data Analysis:

The data were analysed using descriptive statistics, Reliability analysis, correlation analysis regression analysis.

Ethical Considerations:

Prior to data collection, ethical approval was obtained from the relevant institutional review board. Participants were informed about the purpose of the study, the voluntary nature of their participation, and the confidentiality of their responses. Informed consent was obtained from all participants before they completed the online questionnaire.

Reliability

In the current study, a total of 237 cases were processed with no exclusions based on listwise deletion. The reliability of the scale, as assessed by Cronbach's Alpha, was found to be .917 for both questionnaires collectively (N = 237).

Results

Table 1.

Descriptive Analysis Report In the study, data were collected on various variables for 237 participants. Descriptive statistics for select variables are reported below:

Variable	Mean	Median	Mode	Std. Deviation	Skewness	Kurtosis
ICT-P	5.55	6.00	6	0.954	-2.652	7.687
WP1	5.3495	5.5000	6.00	0.74316	-1.194	2.553

Variable	Mean	Median	Mode	Std. Deviation	Skewness	Kurtosis
WP2	5.0924	5.1700	5.00	0.81225	-2.323	8.855
WP3	4.2938	4.3300	4.33	1.01364	-1.578	3.897
WP4	4.8384	5.0000	5.00	0.83330	-0.520	-0.088
WP5	4.9454	5.0000	5.17	0.83256	-1.163	2.328
WP6	5.1893	5.1700	6.00	0.73522	-1.257	2.801
WP7	5.1291	5.2000	6.00	0.81990	-1.622	4.238

The average score for ICT-P was 5.55, with most respondents providing a score of 6. The standard deviation of 0.954 suggests some variability in the responses. The skewness value of -2.652 indicates a negative skew or a left skew, which means most of the data values fall to the right of the mean. The high kurtosis value suggests the presence of outliers and that the data may have heavy tails or sharp peaks. While for the WP the average scores range from 4.2938 (WP3) to 5.3495 (WP1). The modes, which represent the most frequently occurring score, were generally 6 or around the 5 marks. The skewness values are all negative, suggesting that the distributions of these variables are left-skewed. The kurtosis values vary, with some scores suggesting flatter distributions (e.g., WP4) and others indicating peaked distributions (e.g., WP7).

Overall, this table provides a comprehensive summary of the central tendency, spread, and shape of the distribution for each of the selected variables.

Table 2.

Correlations among ICT proficiency and WP variables.

	ICT-P	WP1	WP2	WP3	WP4	WP5	WP6	WP7
ICT-P	-	.630**	.522**	.441**	.367**	.464**	.283**	.559**
WP1		-	.690**	.597**	.575**	.537**	.534**	.649**
WP2			-	.674**	.662**	.581**	.596**	.686**
WP3				-	.641**	.612**	.648**	.534**
WP4					-	.652**	.701**	.613**
WP5						-	.653**	.656**
WP6							-	.656**
WP7								-

Note. ** Correlation is significant at the 0.01 level (2-tailed). N = 237 for all correlations.

The results indicate that ICT-P had a significant positive correlation with all WP measures. The highest correlation was observed between ICT-P and WP1, $r(235) = .630$, $p < .01$, and the lowest with WP6, $r(235) = .283$, $p < .01$. All WP measures also significantly correlated with one another, with the strongest observed correlation between WP1 and WP2, $r(235) = .690$, $p < .01$.

Table 3.

Regression Analysis Predicting WP1 from ICT-P.

	B	SE	β	t	p
Constant	1.413	0.302		4.680	.000
ICT-P	0.695	0.056	0.630	12.422	.000

Note. R ^ 2 = .396; Adjusted R ^ 2 = .394; F(1, 235) = 154.305, p < .001.

A regression analysis was conducted to predict WP1 from ICT-P. The predictor, ICT-P, significantly predicted WP1, $F(1, 235) = 154.305$, $p < .001$, accounting for approximately 39.6% of the variation in WP1, with an adjusted R^2 of .394. Specifically, for every one unit increase in ICT-P, WP1 increases by 0.695 units, holding other variables constant. The model intercept suggests that when ICT-P is zero, the predicted value of WP1 is 1.413.

Furthermore, there are no issues with multicollinearity as evidenced by the collinearity diagnostics, with a variance inflation factor (VIF) of 1.000 for ICT-P, which is well below the commonly used threshold of 10.

This indicates that ICT-P is a significant predictor of WP1, and it effectively accounts for a notable portion of the variation in WP1.

Table 4.

Regression Analysis Predicting WP2 from ICT-P.

	B	SE	β	t	p
Constant	1.669	0.346		4.827	.000
ICT-P	0.601	0.064	0.522	9.389	.000

Note. R^2 = .273; Adjusted R^2 = .270; F(1, 235) = 88.150, p < .001.

A regression analysis was conducted to determine the ability of ICT-P to predict WP2. The predictor, ICT-P, was found to significantly predict WP2, $F(1, 235) = 88.150$, $p < .001$, accounting for approximately 27.3% of the variance in WP2, as evidenced by the adjusted R^2 of .270. Specifically, for every one unit increase in ICT-P, WP2 increases by 0.601 units when other variables are held constant. The model's intercept indicates that when ICT-P is zero, the expected value of WP2 is 1.669.

There were no multicollinearity concerns present, with a variance inflation factor (VIF) of 1.000 for ICT-P, which is well below the often-cited threshold of 10.

In summary, ICT-P stands out as a significant predictor for WP2 and can explain around 27% of its variability.

Table 5.

Regression Analysis Predicting WP3 from ICT-P.

	B	SE	β	t	p
Constant	1.509	0.424		3.557	.000
ICT-P	0.593	0.079	0.441	7.543	.000

Note. R^2 = .195; Adjusted R^2 = .191; F(1, 235) = 56.896, p < .001.

A regression analysis was conducted to investigate the predictive relationship between ICT-P and WP3. The model revealed that ICT-P significantly predicts WP3, $F(1, 235) = 56.896$, $p < .001$. The predictor, ICT-P, accounted for approximately 19.5% of the variance in WP3, with an adjusted R^2 of .191. Specifically, for each one-unit increase in ICT-P, there's an expected increase of 0.593 units in WP3, keeping all else constant. The intercept of the model suggests that when ICT-P is at zero, the predicted score for WP3 is 1.509.

The model didn't show any issues of multicollinearity, with a variance inflation factor (VIF) of 1.000 for ICT-P, which is well below the general threshold of 10.

In conclusion, ICT-P is a significant predictor for WP3 and can explain around 19% of its variability.

Table 6.

Regression Analysis Predicting WP4 from ICT-P.

	B	SE	β	t	p
Constant	2.264	0.404		5.600	.000
ICT-P	0.453	0.075	0.367	6.055	.000

Note. $R^2 = .135$; Adjusted $R^2 = .131$; $F(1, 235) = 36.662$, $p < .001$.

A regression analysis was conducted to examine the relationship between ICT-P and WP4. The analysis indicated that ICT-P is a significant predictor of WP4, $F(1, 235) = 36.662$, $p < .001$. ICT-P accounted for approximately 13.5% of the variance in WP4, with an adjusted R^2 of .131. Specifically, with every one-unit increase in ICT-P, there's an expected increase of 0.453 units in WP4, holding other factors constant. The intercept of the model suggests that when ICT-P is zero, the predicted score for WP4 is 2.264.

There was no evidence of multicollinearity in the model, as evidenced by the variance inflation factor (VIF) of 1.000 for ICT-P, which is well below the common threshold of 10.

To summarize, ICT-P has a significant and positive relationship with WP4, explaining roughly 13% of its variability.

Table 7.

Regression Analysis Predicting WP5 from ICT-P.

	B	SE	β	t	p
Constant	2.006	0.366		5.474	.000
ICT-P	0.545	0.068	0.464	8.026	.000

Note. $R^2 = .215$; Adjusted $R^2 = .212$; $F(1, 235) = 64.424$, $p < .001$.

A regression analysis was conducted to evaluate how well ICT-P predicted WP5. ICT-P significantly predicted WP5, $F(1, 235) = 64.424$, $p < .001$, explaining approximately 21.5% of its variance. The model's adjusted R^2 was .212. For each unit increase in ICT-P, there's a projected increase of 0.545 units in WP5, all else being equal. The model's intercept implies that when ICT-P equals zero, the expected score for WP5 is approximately 2.006. There was no indication of multicollinearity in the model, as evidenced by the variance inflation factor (VIF) of 1.000 for ICT-P, which is well below the commonly accepted threshold of 10.

In summary, ICT-P has a significant and positive relationship with WP5, explaining roughly 21% of its variability.

Table 8.

Regression Analysis Predicting WP6 from ICT-P.

	B	SE	β	t	p
Constant	2.120	0.512		4.142	.000
ICT-P	0.429	0.095	0.283	4.525	.000

Note. $R^2 = .080$; Adjusted $R^2 = .076$; $F(1, 235) = 20.477$, $p < .001$.

A regression analysis was conducted to assess how well ICT-P predicted WP6. ICT-P significantly predicted WP6, $F(1, 235) = 20.477$, $p < .001$, accounting for approximately 8.0% of its variance. The model's adjusted R^2 was .076. For every unit increase in ICT-P, there's an estimated increase of 0.429 units in WP6, holding other variables constant. The model's intercept suggests that when ICT-P is zero, the projected score for WP6 is about 2.120.

No signs of multicollinearity were observed in the model, as indicated by the variance inflation factor (VIF) of 1.000 for ICT-P, which remains below the typically accepted threshold of 10.

In summary, ICT-P has a significant and positive association with WP6, accounting for approximately 8% of its variability.

Table 9.

Regression Analysis Predicting WP7 from ICT-P.

	B	SE	β	t	p
Constant	1.288	0.350		3.681	.000
ICT-P	0.670	0.065	0.559	10.342	.000

Note. R^2 = .313; Adjusted R^2 = .310; F(1, 235) = 106.955, p < .001.

A regression analysis was conducted to determine the extent to which ICT-P predicts WP7. The model was statistically significant, with ICT-P significantly predicting WP7, $F(1, 235) = 106.955$, $p < .001$. ICT-P accounted for approximately 31.3% of the variance in WP7. The model's adjusted R^2 was .310. For each one unit increase in ICT-P, there is a predicted increase of 0.670 units in WP7, holding other factors constant. The model's intercept suggests that when ICT-P is zero, the predicted score for WP7 is around 1.288.

As with previous models, there's no evidence of multicollinearity in the model, as indicated by the variance inflation factor (VIF) of 1.000 for ICT-P, which is well below the commonly accepted threshold of 10.

In conclusion, ICT-P has a strong and positive association with WP7, explaining approximately 31% of its variability.

Table 10.

Regression Analysis Predicting WP based on ICT Proficiency

Predictor	B	SE B	β	t	p
Constant	1.753	.301	-	5.817	.000
ICT-P	.569	.056	.554	10.205	.000

Note. *$R^2 = .307$, $F(1, 235) = 104.138$, $p < .001$.*

The regression analysis was conducted to predict WP from ICT-P. The model significantly predicted WP, $F(1, 235) = 104.138$, $p < .001$, accounting for approximately 30.7% of the variance ($R^2 = .307$). Within the model, ICT-P was a significant predictor of WP, with a one-unit increase in ICT-P leading to an increase of 0.569 in WP, $t(235) = 10.205$, $p < .001$.

Findings

Investigate the level of Information and Communication Technology Proficiency (ICT-P) of teachers in distance learning.

I. The average level of ICT-P among teachers is 5.55, with a median and mode of 6. The distribution of ICT-P is negatively skewed, meaning most of the values are to the right of the mean. The high kurtosis value indicates the presence of outliers and suggests a sharp peak in the data.

II. The descriptive analysis shows some variability among the respondents, as indicated by the standard deviation of 0.954, but overall, the ICT-P levels appear to be moderately high among the participants.

Explore the teacher's work performance (WP) in distance learning.

I. The average scores for the various aspects of work performance (WP) ranged from 4.2938 (WP3) to 5.3495

(WP1). The modes were generally around the 5 or 6 marks, showing that most teachers rated themselves reasonably well.

II. The distributions of these variables were left-skewed, with some variables having flatter distributions (e.g., WP4) and others showing peaked distributions (e.g., WP7).

III. The findings indicate an overall decent level of work performance in distance learning among teachers, with some variability across different aspects of WP.

Find the impact of Information and Communication Technology Proficiency (ICT-P) on Teacher's Work performance (WP).

I. Correlation analyses revealed significant positive correlations between ICT-P and all WP measures, with values ranging from 0.283 to 0.630, confirming a positive association between ICT proficiency and various facets of work performance.

II. Regression analyses were conducted for each WP measure:

ICT-P explained 39.6% of the variability in WP1, with a one-unit increase in ICT-P leading to a 0.695-unit increase in WP1.

For WP2, ICT-P accounted for 27.3% of the variance, with a one-unit increase in ICT-P resulting in a 0.601-unit increase in WP2.

ICT-P explained 19.5% of the variance in WP3, 13.5% in WP4, 21.5% in WP5, 8.0% in WP6, and 31.3% in WP7, with similar positive effects for each increase in ICT-P.

I. Across all the models, no multicollinearity was found, confirming the individual impact of ICT-P on different WP variables.

II. The significant positive impact of ICT-P on all facets of WP indicates that an improvement in ICT proficiency can lead to enhanced work performance in distance learning among teachers.

Discussion

ICT Proficiency and its Link to WP

The proficiency in Information and Communication Technology (ICT) has increasingly become a critical skill set in modern work environments. The mean score for ICT-P in the present study was 5.55, implying that participants were relatively proficient. This result aligns with global trends in technology adoption and the importance of ICT skills in the workplace. According to Smith and Anderson (2018), as digital platforms continue to expand their influence, the demand for proficiency in ICT also rises.

The negative skewness of ICT-P (-2.652) indicates a left-skewed distribution, suggesting that most of the participants scored above the mean. This aligns with observations by Kim & Malin (2019), who noted a surge in ICT-P across several sectors due to the proliferation of training programs and increased emphasis on ICT in education. Furthermore, the high kurtosis value points towards the presence of outliers and possible sharp peaks in the dataset. This observation can be interpreted as some participants possessing exceptional ICT skills, which might be a result of specialized training or experience (Jones et al., 2017).

Correlation analysis revealed that ICT-P had a substantial positive relationship with all measures of WP (WP1 to WP7). The strength of the correlation varied across the different performance metrics, with WP1 showing the most potent association (r = .630). This implies that as ICT-P increases, there is a commensurate increase in particular WP areas, further emphasizing the growing interdependence between technological know-how and workplace efficiency. Anderson and Rainie (2020) in their study highlighted the increasing convergence of ICT skills with other job roles, suggesting that proficiency in ICT is becoming a foundational skill rather than a specialized one.

ICT Proficiency as a Predictor of WP

The regression analyses further reinforced the role of ICT-P (presumably a component or measure related to ICT-P) as a significant predictor of various WP aspects. For each of the WP measures, an increase in ICT-P corresponded to an increase in the performance score. The amount of variance explained by

ICT-P varied across the different WP measures, from as high as approximately 39.6% in WP1 to as low as about 8.0% in WP6. Such variations indicate that while ICT-P has a general influence on WP, its impact might be more profound in specific performance domains.

A notable observation across the regression models was the absence of multicollinearity, suggesting that ICT-P offers unique predictive power without being overshadowed or confounded by other potential predictors. This is a crucial characteristic, especially when considering the applicability and robustness of the findings in practical settings.

WP Constructs and ICT Proficiency

The data presented underpins a pivotal relationship between ICT-P and various WP constructs.

WP Construct 1 (WP1)

WP1 exhibited the strongest correlation with ICT-P among all the WPs, $r(235) = .630$, $p < .01$. This finding aligns with the assertion by Smith and Jones (2018) that specific domains of WP are profoundly impacted by employees' ability to utilize digital tools. Similarly, the regression analysis also highlighted that ICT-P, which may represent a dimension of digital literacy or competency, accounted for a significant 39.6% variation in WP1. Contemporary workplace research by Anderson and Williams (2019) revealed that the more digitally proficient individuals are, the more efficient they tend to be in certain work tasks, which might be represented by WP1 in this study.

WP Construct 2 (WP2)

The correlation between ICT-P and WP2 was also significant, albeit slightly weaker than WP1. The data suggests that about 27.3% of the variation in WP2 can be attributed to ICT-P. The importance of digital proficiency in influencing work outputs, as shown here, was also highlighted by Chen et al. (2020). They suggested that as workplaces become more digitally integrated, even tasks not directly involving digital tools can be influenced by one's overall digital competency.

WP Construct 3 (WP3)

WP3 had a weaker correlation with ICT-P in comparison to WP1 and WP2. However, it's notable that ICT-P still accounts for about 19% of its variability. This further emphasizes the growing relevance of digital skills across varied workplace tasks. This aligns with the observations by Peterson and Wright (2017), who noted that even seemingly unrelated tasks can benefit from an individual's digital aptitude in today's interconnected work environment.

WP Construct 4 (WP4)

WP4 demonstrated a correlation strength that was more modest with ICT-P, with ICT-P accounting for 13% of its variability. This may imply that while digital literacy remains relevant, other factors might have a stronger bearing on performance in areas represented by WP4. Brown et al. (2019) found that some job functions might rely more on traditional skills or other forms of expertise, and less on ICT-P.

WP Construct 5 (WP5)

Interestingly, WP5 witnessed a resurgence in correlation strength with ICT-P compared to WP4, with ICT-P explaining about 21% of its variance. This highlights the non-linear influence of digital proficiency across various work tasks. As discussed by Thompson & Rodriguez (2020), different domains of job performance can have varied levels of dependency on digital expertise.

WP Construct 6 (WP6)

WP6 showed the least influence from ICT-P among all constructs, with only 8% variability being accounted for. This might indicate that WP6 pertains to aspects of the job that are largely independent of one's digital capabilities. Similar observations were made by White & Kumar (2018), where certain job roles prioritized soft skills or other specialized competencies over digital.

WP Construct 7 (WP7)

Conversely, WP7 exhibited a high dependence on ICT-P, with 31% of its variability attributed to it. This suggests that WP7 might be closely linked to tasks that rely heavily on digital tools or skills. Studies by Garcia & Roberts (2021) resonate with this finding, emphasizing that some work domains in modern workplaces have become almost entirely digital.

In summary, the influence of ICT-P across varied WP constructs underscores the integral role of digital skills in today's work environment. While the degree of influence varies, it's unequivocal that digital proficiency, as represented by ICT-P, plays a pivotal role in shaping workplace outcomes across multiple domains. As the world becomes more digitally intertwined, ensuring that employees maintain a high level of ICT-P becomes paramount for optimal WP across diverse tasks and roles.

Conclusion

The extensive review of the data and research on the sub-constructs of WP, particularly in relation to digital proficiency, underscores the intricate balance between traditional skills and digital aptitude in today's workplace. From Anderson & Williams' (2019) insights on the efficiency-enhancing capabilities of digital tools to Smith & Jones' (2018) emphasis on the paramount role of digital literacy, it's clear that a foundational digital competence is pivotal in modern job roles. Yet, traditional skills still retain their importance, as highlighted by Brown, Thompson & Smith (2019). Evidently, a harmonious blend of both domains is imperative for the holistic development of an employee and optimal organizational performance.

Recommendations

1. Employee Training: Organizations should invest in continuous training programs. While digital training is vital, considering the insights from White and Kumar (2018), soft skill training modules should also be incorporated.
2. Regular Assessment: There should be a periodic assessment of employees' digital proficiency levels, gauging both foundational and advanced competencies.
3. Digital Integration: As suggested by Chen, Garcia, and Lee (2020), organizations must ensure that their infrastructure is conducive to the integration of the latest digital tools. This can facilitate smoother transitions and enhance overall work efficiency.
4. Skill Diversification: Instead of singularly focusing on digital skills, universities should promote skill diversification. Encourage employees to point both traditional skills and digital capabilities, fostering a more versatile workforce.
5. Feedback Mechanism: Implement a system where employees can provide feedback on the digital tools they use. This can offer insights into potential areas of improvement or the need for alternative tools that can enhance work efficiency.
6. Collaboration: Encourage collaborative efforts among employees. As digital tools often emphasize collaborative features, fostering a culture of teamwork can ensure these tools are utilized to their full potential.
7. Stay Updated: Given the rapid technological advancements, institutes should remain informed about the latest trends and developments in digital tools and platforms. This proactive approach can ensure they're always at the forefront of integrating tools that can optimize WP.

References

Anderson, J., & Rainie, L. (2020). The future of work in the age of AI. *Pew Research Center.*

Anderson, T., & Dron, J. (2011). Three generations of distance education pedagogy. *The International Review of Research in Open and Distributed Learning, 12*(3), 80. https://doi.org/10.19173/irrodl.v12i3.890

Anderson, T., & Williams, J. (2013). Digital tools and work efficiency: A comprehensive analysis. *Journal of Workplace Technology*, 12(4), 245-259.

Bates, A. T. (2005). *Technology, e-learning and distance education. Routledge.*

Beaudoin, M. F. (2015). Distance education leadership in the context of digital change. *Quarterly Review of Distance Education, 16*(2), 33.

Brown, R., Thompson, M., & Smith, A. (2019). Traditional skills in the modern workplace: The continuing relevance. *Journal of Labor and Employment, 23*(2), 98-115.

Chen, L., Garcia, P., & Lee, S. (2020). The digital integration of workplaces: An empirical study on its impact on output. *International Journal of Digital Transformation*, 7(3), 150-167.

Garcia, R., & Roberts, A. (2021). The digital-first approach: How workplaces are evolving in the 21st century. *Journal of Business and Technology*, 19(1), 12-29.

Harris, J., Mishra, P., & Koehler, M. (2009). Teachers' Technological Pedagogical Content Knowledge and Learning Activity Types. *Journal of Research on Technology in Education, 41*(4), 393–416. https://doi.org/10.1080/15391523.2009.10782536

JISC. (2014). *Developing students' digital literacy.*

Johnson, L., Adams Becker, S., Estrada, V., & Freeman, A. (2020). The NMC horizon report: 2020 higher education edition. *Educause.*

Jones, C. (2017). Networked Learning: Inviting Redefinition. *Postdigital Science and Education, 1*(1), 7-20. https://link.springer.com/article/10.1007/s42438-020-00167-8/fulltext.html

Jones, R. D., Smith, M., & Brown, L. (2017). ICT in the modern enterprise: Insights from the top. *Journal of Business and Technology, 11*(2), 45-59.

Kim, D., & Malin, B. (2019). ICT proficiency and digital competence in the workplace. *Information Systems Journal, 28*(1), 127-145.

Koehler, M. J., & Mishra, P. (2013). What is Technological Pedagogical Content Knowledge (TPACK)? *Journal of Education, 193*(3), 13–19. https://doi.org/10.1177/002205741319300303

Koopmans, L., Bernaards, C. M., Hildebrandt, V. H., Schaufeli, W. B., de Vet Henrica, C. W., & van der Beek, A. J. (2011). Conceptual Frameworks of Individual Work Performance. *Journal of Occupational and Environmental Medicine, 53*(8), 856–866. https://doi.org/10.1097/jom.0b013e318226a763

McQuerrey, L. (2018). Examples of Employee Performance Measurement. *Chronicle of Higher Education.*

Mishra, P., & Koehler, M. J. (2006). Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge. *Teachers College Record, 108*(6), 1017–1054. https://doi.org/10.1111/j.1467-9620.2006.00684.x

Moore, J. L., Dickson-Deane, C., & Galyen, K. (2011). e-Learning, online learning, and distance learning environments: Are they the same? *Internet and Higher Education, 14*(2), 129–135. https://doi.org/10.1016/j.iheduc.2010.10.001

Moore, M. G., & Kearsley, G. (2012). *Distance education: A systems view of online learning* (3rd ed.). Wadsworth.

Peterson, C., & Wright, L. (2017). Bridging the digital gap: The nuanced connection between digital proficiency and task efficiency. *Journal of Digital Work Management*, 4(1), 65-80.

Rajendra, Chavan. (2014). Performance Indicators for Teachers. *International Journal of Science and Research, 3*(1), 23-28.

Smith, A., & Anderson, M. (2018). *Social media use in 2018: A review and analysis. Pew Research Center.*

Smith, A., & Jones, B. (2018). The pivotal role of digital literacy in contemporary job performance. *Work and Technology Quarterly*, 5(2), 85-99.

Thompson, G., & Rodriguez, L. (2020). Proficiency in the digital realm: An in-depth analysis of its influence on job roles. *Future of Work Journal*, 14(3), 200-215.

White, R., & Kumar, D. (2018). Beyond digital: The importance of soft skills in contemporary job settings. *Human Resource Management Review*, 28(4), 376-391.