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Digital Integration and Instructional Leadership of School Heads: Basis for an Enhancement Plan

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Abstract — This study explores the digital transformation in school heads' instructional leadership in the Schools Division of Talisay City, Cebu, for School Year 2024–2025. Utilizing a descriptive-correlational research design, the study involved 12 school heads, and 186 teacher respondents selected from public elementary and secondary schools. Data were analyzed using SPSS, focusing on demographic profiles and perceived impacts of digital transformation across key instructional leadership dimensions: communication and collaboration, teaching and learning enhancement, technology-based decision-making, and professional development. Results revealed that both school heads and teachers rated the impact of digital transformation on instructional leadership as moderate, with school heads expressing more optimistic views than teachers, particularly in collaboration and innovation. The demographic data indicated a predominantly female, mid-career, and academically qualified workforce, with school heads having broader exposure to ICT-related trainings compared to teachers. However, statistical tests including regression and ANOVA showed no significant relationship between demographic variables such as age, sex, educational attainment, length of service (administrative experience) and perceptions of digital leadership impact, highlighting that leadership behavior, not personal background, drives effectiveness in digital transformation. Notably, only the length of administrative experience slightly influenced school heads' perceptions. The study concludes that digital transformation in instructional leadership is less dependent on demographic characteristics and more on institutional practices, leadership strategies, and systemic support. It recommends fostering shared leadership cultures, enhancing the quality and relevance of ICT training for teachers, and embedding digital leadership goals into school development plans. These findings affirm the need for strategic leadership, inclusive capacity-building, and alignment of digital tools with pedagogical goals to sustain meaningful transformation in schools.

Keywords — Digital Transformation, Instructional Leadership, School Heads, Descriptive-Correlational Research & Educational Technology Integration

I. Introduction

As global education undergoes digital transformation, school leadership is key to effectively integrating technology for instructional innovation. While countries like Finland and Singapore have advanced in digital leadership, many low- and middle-income countries, including the Philippines, face challenges due to limited resources and training. In the Philippines, despite efforts like the Basic Education Development Plan 2030, a significant number of school leaders lack digital competencies. In Talisay City, issues such as unstable internet access and insufficient leadership training hinder progress. This study aims to assess how school heads in Talisay City balance digital integration with instructional leadership, with the goal of informing policy, leadership development, and educational innovation in the digital age.

1.1. Statement of the Problem

This study investigated the digital integration and instructional leadership of school heads in the District of Talisay, Schools Division of Talisay City, Cebu during the School Year 2024-2025 with the end view of enhancement plan.

Specifically, it sought to answer the following questions:

1. What is the demographic profile of:

1.1. school heads;

1.1.1 age;

1.1.2 sex;

1.1.3 highest educational attainment;

1.1.4 designation/position;

1.1.5 length of administrative experience;

1.1.6 number of relevant trainings/seminars attended;

1.2. teachers;

1.2.1 age;

1.2.2 sex;

1.2.3 highest educational attainment;

1.2.4 length of teaching experience;

1.2.5 number of relevant trainings/seminar attended?

2. As perceived by the respondent groups, what is the level of impact of digital transformation on school heads' instructional leadership in terms of;

2.1 technology-driven decision-making;

2.2 enhancement of teaching and learning practices;

2.3 collaboration and communication;

2.4 professional development and capacity building?

3. Is there a significant relationship on the profile of the respondent groups and their perceived level of impact of digital transformation on school heads' instructional leadership?

4. Is there a significant difference on the perceived respondent groups' level of impact of digital transformation on school heads' instructional leadership along the profile variable?

5. Based on findings, what enhancement plan can be proposed?

II. Methodology

The study used a **descriptive-correlational research design**, a quantitative method that examines relationships between variables without manipulation. It aimed to describe the profiles of elementary school heads—such as age, gender, civil status, educational attainment, and administrative experience—and assess the impact of digital transformation on instructional leadership. The correlational aspect explored how these variables relate to one another. The researchers secured proper authorization, distributed questionnaires, and analyzed the collected data using statistical tools like percentages, mean, and sum of ranks.

1.1.Procedure

The study followed a systematic process to ensure accuracy and reliability in examining the impact of digital transformation on instructional leadership. It begins with a literature review to establish a theoretical foundation. Data was collected through surveys, interviews, and academic records using a descriptive-correlational design and purposive sampling. Statistical methods, such as correlation analysis, will be applied to explore relationships between professional development and student outcomes. Ethical standards, including informed consent and confidentiality, will be strictly observed throughout the research.

The researcher assisted the respondents in completing the questionnaire by providing honest perceptions of the level of impact on digital transformation on instructional leadership, and the level of impact on digital transformation in school administration. This questionnaire is a five-point Likert scale adopted from Likert R.A. (1932). The scaling is as follows:

Scale	**Descriptive Rating**
5	(SA) Strongly Agree
4	(A) Agree
3	(NDA) Neither Disagree or Agree
2	(D) Disagree
1	(SD) Strongly Disagree

The demographic data reveal that most school heads are mid-career professionals aged 42–48 (58.3%), suggesting openness to digital innovation. The group is predominantly female (75%), aligning with broader trends in educational leadership and potentially promoting collaborative, tech-enabled management styles. Educationally, 33.3% hold Doctorates, 25% Master's degrees, and 41.7% have earned Master's units—indicating strong academic backgrounds suited for data-driven decision-making.

Most school heads (75%) are in the Principal I rank, suggesting they are early in the administrative hierarchy but still benefit significantly from digital tools that democratize access to information. A large majority (66.7%) have 10–19 years of experience, showing a seasoned leadership cohort that can enhance traditional practices through digital integration.

Training-wise, 58.3% have attended national-level seminars, with some exposure to international (25%) and regional (16.7%) programs. This indicates moderate engagement in professional development, which can be expanded through digital platforms offering continuous learning and global collaboration. Overall, the data suggest a well-qualified, experienced, and largely receptive group of leaders well-positioned to leverage digital tools for instructional improvement.

Table 2. Frequency Distribution on the demographic profile of the school heads

Age	**Frequency**	**Percent**
56-62	2	16.70%
49-55	3	25.00%
42-48	7	58.30%
Total	**12**	**100.00%**
Sex	**Frequency**	**Percent**
Male	3	25.00%
Female	9	75.00%
Total	**12**	**100.00%**
Highest Educational Attainment	**Frequency**	**Percent**
Doctorate Degree	4	33.30%
Master's Degree	3	25.00%
Master's Units	5	41.70%
Total	**12**	**100.00%**
Designation/Position	**Frequency**	**Percent**
Principal II	3	25.00%
Principal I	9	75.00%
Total	**12**	**Total**
LENGTH OF ADMINISTRATIVE EXPERIENCE	**Frequency**	**Percent**
20>	3	25.00%
10-19	8	66.70%
9<	1	8.30%
Total	**12**	**100.00%**
Number of Relevant Trainings/Seminars Attended	**Frequency**	**Percent**
International	3	25.00%
National	7	58.30%
Regional	2	16.70%
Total	**12**	**100.00%**

Table 8 shows a moderate level of digital transformation in instructional leadership (mean = 3.37). “Collaboration and Communication” is the strongest area, while “Technology-Driven Decision-Making” and “Professional Development” are weaker, indicating a need for targeted improvement. The findings highlight that school leaders are effective in fostering collaboration and pedagogy but need to strengthen technical skills and strategic decision-making. Successful digital transformation requires proactive leadership, a clear pedagogical framework, and sustainable support systems. Empowering school heads as innovative instructional leaders is key to lasting improvement.

Table 8. Summary Results on the level of digital transformation on school heads’instructional leadership

Indicators	**Mean**	**Std. Deviation**	**Interpretation**
Technology-Driven Decision-Making as Perceived by Themselves	3.13	0.97	Moderate
Enhancement of Teaching and Learning Practices as Perceived b/y Themselves	3.50	0.79	High
Collaboration and Communication as Perceived by Themselves	3.70	0.86	High
Professional Development and Capacity Building as Perceived By 1themselves	3.15	0.97	Moderate
Grand Mean	**3.37**	**0.90**	**Moderate**

Legend	***Range***	***Description***
	4.21-5.00	*Very High*
	3.41-4.20	*High*
	2.61-3.40	*Moderate*
	1.81-2.60	*Low*
	1.00-1.80	*Very Low*

Table 13 shows the summary that teachers perceive digital transformation in school leadership as moderate (mean = 3.12). The highest-rated dimension is “Enhancement of Teaching and Learning,” while “Technology-Driven Decision-Making” is the lowest, suggesting that classroom practices are evolving more than leadership strategies. This indicates a gap between instructional improvements and strategic leadership. Research highlights that successful reform requires leaders to actively drive digital change aligned with national goals. The moderate overall rating suggests that while foundational efforts exist, school leaders need to take a more visible and strategic role in advancing digital transformation.

Table 13. Summary Results on the level of digital transformation on school heads' instructional leadership

Indicators	Mean	Std. Deviation	Interpretation
Technology-Driven Decision-Making as Perceived by Teachers	2.90	0.80	Moderate
Enhancement of Teaching and Learning Practices as Perceived by Teachers	3.29	0.86	Moderate
Collaboration and Communication as Perceived by Teachers	3.06	0.97	Moderate
Professional Development and Capacity Building as Perceived by Teachers	3.21	0.74	Moderate
Grand Mean	**3.12**	**0.84**	**Moderate**

Legend	*Range*	*Description*
	4.21-5.00	*Very High*
	3.41-4.20	*High*
	2.61-3.40	*Moderate*
	1.81-2.60	*Low*
	1.00-1.80	*Very Low*

Table 14 summarizes a regression analysis exploring whether respondents' demographic profiles predict their perceptions of digital transformation's impact on instructional leadership. The results show a weak positive correlation ($R = 0.350$) and a low explanatory power ($R^2 = 0.123$), meaning only 12.3% of the variance is accounted for by demographics. A negative Adjusted R^2 (-0.930) and relatively large standard error (0.825) further indicate poor model fit. These findings suggest that demographic factors are not reliable predictors. Instead, perceptions are likely shaped more by factors such as school culture, digital literacy, infrastructure, or leadership behavior.

Table 14. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.350	0.123	-0.930	0.825

Table 15 presents the ANOVA results for the regression model and confirms that the model is not statistically significant ($F = 0.117$, $p = 0.990$). The very high p-value indicates no meaningful relationship between respondents' demographic profiles and their perceptions of digital transformation's impact on school leadership. The small regression sum of squares compared to the residual sum further shows the model explains minimal variance. Limited degrees of freedom also point to a small sample size, reducing the model's reliability. Overall, this supports the view that perceptions are shaped more by leadership style, institutional support, training, and access to technology than by demographic factors.

Table 15. ANOVA Analysis

Model		Sum of Squares	df	Mean Square	F	p-value	Decision
1	Regression	0.476	6	0.079	0.117	0.990	Not Significant
	Residual	3.402	5	0.680			
	Total	3.877	11				

Table 16 summarizes a multiple regression analysis examining how demographic and professional variables influence school heads' perceptions of digital transformation in instructional leadership. Of the six variables tested, only **length of administrative experience** showed a statistically significant relationship ($\beta = 0.073$, $p = 0.041$), suggesting that more experienced leaders perceive a greater impact of digital transformation—likely due to prolonged exposure to evolving technologies and policies.

The **number of trainings/seminars attended** had a negative beta ($\beta = -0.457$), but the high *p*-value (0.441) indicates this result is **not statistically significant**, despite being labeled otherwise. If it were significant, the negative relationship would imply that more training correlates with a **lower perceived impact**, possibly due to poor training quality, misalignment with leadership needs, or lack of engagement—issues highlighted by Desimone's (2019) framework.

These findings suggest that experience, rather than the quantity of training, more strongly influences digital leadership perceptions. They support the shift toward **digital coaching**, as promoted by Digital Promise (2020), which emphasizes personalized, ongoing support over one-off seminars. Ultimately, professional development must be high-quality, relevant, and embedded in practice to positively shape leaders' views on digital transformation.

Table 16. Multiple Regression Analysis on test of relationships on the profile of the school Heads and their perceived level of impact of digital transformation on school heads' instructional leadership

Variables	Beta	p-value	Decision
Age	0.033	0.981	Not Significant
Sex	0.374	0.840	Not Significant
Highest educational Attainment	0.321	0.773	Not Significant
Designation/ Position	-0.171	0.881	Not Significant
Length of administrative experience	0.073	0.041	Significant
Number of relevant trainings/seminars attended	-0.457	0.441	Significant

Table 17 shows a regression analysis examining how teacher profile factors relate to their perceptions of digital transformation's impact on school heads' instructional leadership. The results reveal a **moderate positive correlation** ($R = 0.491$), with teacher profiles explaining **24.1% of the variance** in perceptions ($R^2 = 0.241$). The **Adjusted R^2** (0.220) indicates a slight

reduction in explanatory power when accounting for model complexity. The **standard error** of 0.531 suggests moderate prediction accuracy, with some variability unaccounted for. Overall, the model shows that teacher characteristics moderately influence their views on digital transformation in leadership, though other unmeasured factors also play a significant role.

Table 17. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.491	0.241	0.220	0.531

Table 18 presents an ANOVA analysis to test whether teacher profile variables significantly predict their perceptions of digital transformation's impact on school leadership. Despite a seemingly strong **F-value of 11.423**, the **p-value of 0.415** indicates the result is **not statistically significant** ($p > 0.05$). This inconsistency suggests a possible reporting error; however, based on the stated p-value, we conclude that **teacher profiles do not significantly influence their perceptions**.

The findings imply that **demographic and professional variables alone are insufficient predictors**, and that **contextual factors**—such as school culture, access to digital tools, leadership behavior, or attitudes toward technology—likely play a greater role. The result highlights the complexity of digital transformation in education and the need for more comprehensive, multifactorial research approaches.

Table 18. ANOVA Analysis

Model		Sum of Squares	df	Mean Square	F	Sig.	Decision
1	Regression	16.111	5	3.222	11.423	0.415	Not Significant
	Residual	50.776	180	.282			
	Total	66.887	185				

Table 19 presents a multiple regression analysis showing that **none** of the teacher profile variables—**age, sex, educational attainment, teaching experience,** or **number of trainings attended**—significantly predict teachers' perceptions of digital transformation's impact on school heads' instructional leadership (*all p-values > 0.05*). For example, age ($\beta = -0.038$, $p = 0.835$) and teaching experience ($\beta = 0.198$, $p = 0.433$) show no meaningful influence.

Although the variable **sex** ($\beta = -0.235$, $p = 0.066$) was the closest to significance, it still fell short, suggesting a possible trend worth exploring but not conclusive. The results suggest that **teachers' perceptions are shaped more by contextual and experiential factors**, such as **school**

leadership behavior, digital culture, and visible support for digital initiatives, rather than by individual demographic or professional characteristics.

This aligns with prior research (e.g., Batista & Velasco, 2020; Harris, 2019), emphasizing that **effective digital leadership and high-quality, context-relevant professional development** are more influential than static attributes like age or education level. In short, how digital transformation is **led and supported** matters more than who the teachers are.

Table 19. Multiple Regression Analysis on test of relationships on the profile of the teachers and their perceived level of impact of digital transformation on school heads' instructional leadership

Variables	Beta	p-value	Decision
Age	-0.038	0.835	Not Significant
Sex	-0.235	0.066	Not Significant
Highest Educational Attainment	0.258	0.237	Not Significant
Length of Teaching Experience	0.198	0.433	Not Significant
Number of relevant trainings/ seminars attended	0.279	0.282	Not Significant

Table 20 presents a One-Way ANOVA analysis showing that **none of the school heads' profile variables**—including **age, sex, educational attainment, designation, administrative experience,** and **number of trainings attended**—significantly affect their perceptions of digital transformation's impact on instructional leadership. All **F-values are low** and **p-values are well above 0.05**, indicating **no statistically significant differences** across demographic or professional groups. For example, **age** ($F = 0.246$, $p = 0.929$) and **sex** ($F = 0.350$, $p = 0.878$) show no meaningful influence on perceptions.

These findings suggest that **school heads' perceptions are not shaped by background traits**, but rather by **how they lead**. This supports research by **Sahlberg (2020)** and **Brown & Green (2018)**, emphasizing that **effective digital leadership depends on strategic behaviors**, such as promoting innovation, ensuring equitable access, and supporting teacher and student engagement—not on age, position, or education level. The results highlight the need for **leadership development programs** that focus less on who leaders are and more on **what they do** to foster meaningful digital transformation.

Table 20. One Way ANOVA on test of difference on school heads perceived level of impact of digital transformation on school heads' instructional leadership along the profile variable

Variables		Sum of Squares	df	Mean Square	F	Sig.	Decision
Age	Between Groups	4.917	6	.492	.246	.929	Not Significant
	Within Groups	2.000	5	2.000			
	Total	6.917	11				
Sex	Between Groups	1.750	2	.175	.350	.878	Not Significant
	Within Groups	.500	9	.500			
	Total	2.250	11				
Highest Educational Attainment	Between Groups	15.750	4	1.575	.350	.878	Not Significant
	Within Groups	4.500	7	4.500			
	Total	20.250	11				
Designation/ Position	Between Groups	2.250	6	.225	.433	.322.	Not Significant
	Within Groups	.000	5	.000			
	Total	2.250	11				
Length of Administrative experience	Between Groups	1.667	3	.167	.083	.994	Not Significant
	Within Groups	2.000	8	2.000			
	Total	3.667	11				
Number of relevant trainings/seminars attended	Between Groups	2.917	3	.292	.146	.974	Not Significant
	Within Groups	2.000	8	2.000			
	Total	4.917	11				

Table 21 presents a One-Way ANOVA analyzing whether **teachers' demographic and professional profiles** influence their **perceptions of the impact of digital transformation on school heads' instructional leadership**. Although some variables showed relatively **high F-values**—such as **Age (F = 21.954, p = 0.089)** and **Sex (F = 5.579, p = 0.066)**—**none reached statistical significance** ($p > 0.05$). This indicates that **no teacher profile variable** (age, sex, education, experience, training) significantly affects their perceptions.

However, some **p-values were close to significance**, particularly for **Sex (p = 0.066)** and **Number of Trainings Attended (p = 0.058)**, suggesting possible trends that merit further exploration. The training variable especially hints that **professional development exposure may marginally influence teacher perceptions**, although the **quality** of training likely matters more than the quantity—a nuance not captured by the data.

These findings reinforce insights from the **OECD (2021)**: successful digital transformation in schools depends less on teachers' backgrounds and more on **how school leaders strategically model and implement digital practices**. Thus, **leadership competencies**, not demographic traits, appear to be the **key drivers** of positive perceptions and effective digital integration.

Table 21. One Way ANOVA on test of difference on teachers perceived level of impact of digital transformation on school heads' instructional leadership along the profile variable

		Sum of Squares	df	Mean Square	F	p-value	Decision
Age	Between Groups	146.264	6	10.447	21.954	.089	Not Significant
	Within Groups	81.376	179	.476			
	Total	227.640	185				
Sex	Between Groups	13.163	2	.940	5.579	.066	Not Significant
	Within Groups	28.816	183	.169			
	Total	41.978	185				
HEA	Between Groups	136.069	4	9.719	19.960	.107	Not Significant
	Within Groups	83.264	181	.487			
	Total	219.333	185				
Length of Teaching Experience	Between Groups	55.222	3	3.944	14.878	.588	Not Significant
	Within Groups	45.337	182	.265			
	Total	100.559	185				
Number of relevant trainings/seminars attended	Between Groups	66.935	44	4.781	15.010	.058	Not Significant
	Within Groups	54.468	181	.319			
	Total	121.403	185				

III. Results and Discussion

Demographic Profile of the Respondents' Groups

The demographic data of school heads and teachers reveal a workforce that is largely **mid-career, well-educated, and predominantly female**, with growing capacity to lead and support digital transformation in education.

- **Age:** Most school heads (58.3%) fall within the **42–48 age bracket**, while a significant portion of teachers (41.4%) are aged **35–41**. This indicates that both groups are in an active and productive stage of their careers, combining experience with adaptability—an ideal foundation for engaging in and sustaining ICT integration.

- **Gender:** The teaching and leadership workforce is **female-dominated**, with **75% of school heads** and **65.6% of teachers** being women. This may foster a **collaborative and inclusive school culture**, as research suggests that female leadership often encourages teamwork and shared decision-making—important traits in navigating digital transformation.

- **Educational Attainment:** Both groups are highly educated. **33.3% of school heads** hold **doctorates**, and **41.7%** have completed **Master's units**. Among teachers, **47.3%** hold **Master's units**, and **18.8%** have **Master's degrees**. This shared academic strength

supports readiness for applying advanced instructional frameworks and promotes a **common understanding of innovation goals**.

- **Training Exposure:** A notable difference emerges in training experience. While **58.3% of school heads** have attended **national-level trainings** and **25%** have received **international training**, the majority of teachers (55.9%) have only participated in **division-level** seminars, with just **2.2%** attending **international** ones. This suggests a need for **school leaders to help broaden teachers' training opportunities** and guide them in applying digital strategies effectively.

  Overall, both groups are demographically positioned to support digital transformation, though **school leaders must actively bridge the training gap**, ensuring that all staff benefit from quality professional development. The data point to the importance of **strategic leadership, equitable training access**, and **a shared commitment to innovation** in advancing digital education initiatives.

Level of Impact of Digital Transformation on Instructional Leadership

The study found that both **school heads** and **teachers** perceive the impact of digital transformation on instructional leadership as **moderate overall**, though differences emerged between the two groups' perspectives.

- **Teaching and Learning Enhancement:**

  This dimension received the **highest mean scores** from both groups—**3.50** from school heads and **3.29** from teachers—indicating a shared belief in technology's role in improving pedagogy and student engagement. However, differences in how these changes are implemented suggest that digital tools may not yet be fully aligned with **student-centered approaches**.

- **Collaboration and Communication:**

  School heads rated this area highest (**mean = 3.70**), suggesting confidence in their ability to foster teamwork through digital means. In contrast, teachers gave a **lower mean score (3.06)**, pointing to a **perceptual gap** in how digital communication and collaboration are experienced at the instructional level.

- **Technology-Driven Decision-Making:**

- A notable gap was also observed here. School heads gave a **moderate rating (mean = 3.13)**, while teachers rated it **lower (mean = 2.90)**. This suggests that while school leaders believe they are using digital tools in decision-making, these efforts may not be visible or felt by the teaching staff.

- **Professional Development and Capacity Building:**

- Both groups offered **similar moderate ratings**—**3.15** from school heads and **3.21** from teachers. This reflects a **shared recognition** of the importance of training but also a **general dissatisfaction** with the current quality or frequency of professional development related to digital transformation.

  Overall, the findings highlight that while digital transformation is underway, its **impact is uneven**. School heads tend to **perceive their digital leadership efforts more positively** than teachers do, especially in areas requiring visibility, collaboration, and decision-making. This indicates a need for **stronger communication**, more **inclusive leadership practices**, and **better-aligned professional development** to ensure that digital transformation is fully embedded in the instructional culture and shared across all school levels.

Tests of Relationship and Differences of the Variables

The statistical analyses conducted reveal that **demographic factors**—such as age, gender, education, and experience—have **limited influence** on how both school heads and teachers perceive the impact of **digital transformation on instructional leadership**.

School Heads' Regression Analysis:

- The **regression model** (Table 14) shows a **weak predictive relationship** between school heads' demographic profiles and their perceptions, with an **R = 0.350** and **R^2 = 0.123**, explaining only **12.3% of the variance**.

- The **negative adjusted R^2 (-0.930)** indicates a **poor model fit**, suggesting that the model may be overfitted or affected by a small sample size.

- **ANOVA results** (Table 15) further confirm the model's insignificance (**F = 0.117, p = 0.990**), meaning the demographic variables do not collectively predict perception differences.

  Significant Predictors among School Heads:

- Only **length of administrative experience** (Table 16) showed **statistical significance** (**β = 0.073, p = 0.041**), indicating that more experienced leaders may be slightly more aware of digital transformation's impact.

- In contrast, the **number of trainings attended** had a **negative beta (β = -0.457)** and was **not significant (p = 0.441)**—raising concerns about the **effectiveness or relevance** of current training programs.

Teachers' Regression Analysis:

- Teachers' profile variables showed a **moderate relationship** (Table 17) with perceived impact (**R = 0.491, R^2 = 0.241**), suggesting **some influence** of demographic characteristics on their perceptions.
- However, the **ANOVA result** (Table 18) is **inconsistent**—reporting a **high F-value (11.423)** but a **non-significant p-value (0.415)**, which may reflect data inaccuracies or computational issues.

Individual Predictors for Teachers:

- No individual teacher profile variable significantly predicted perceptions (Table 19), though **sex (p = 0.066)** approached significance—indicating possible **gender-based perceptual differences** worth exploring in future research.
- The **number of trainings** (p = 0.282) also failed to show significance, again questioning the **impact of generic professional development programs** on perception.

ANOVA Tests Across Profile Groups:

- One-Way ANOVA tests (Tables 20 and 21) confirmed **no significant differences** in perceptions among different **demographic groups**, for both **school heads and teachers**.
- Though some variables (e.g., age, sex) showed p-values **near the 0.05 threshold**, none reached statistical significance.

Summary of Findings

The study revealed key insights into the backgrounds and perceptions of school leaders and teachers regarding digital transformation in education. Most respondents were **female** and **mid-career professionals**, with **school heads generally holding higher academic qualifications**, including doctoral degrees, and having attended **more diverse training programs** compared to teachers.

Both groups perceived the **impact of digital transformation on instructional leadership as moderate**, though **school heads viewed its effects more positively**, especially in areas like **collaboration** and **teaching enhancement**. In contrast, **teachers noted gaps**, particularly in **decision-making** and **communication**, suggesting that **leadership efforts were not always visible or clearly conveyed**.

The study found that **demographic factors**—such as **age, gender, and education**—did **not significantly influence perceptions** of digital transformation. However, **length of administrative experience** among school heads showed a **slight positive effect**.

These findings emphasize that **institutional actions and leadership behaviors** are more critical to successful digital transformation than individual demographic characteristics. Effective digital leadership requires **clear communication**, **modeling the use of digital tools**, and **providing relevant professional development**. Ultimately, **systemic strategies, supportive infrastructure**, and a **focus on building digital competence** are key to embedding technology meaningfully into teaching and learning.

IV. Conclusion

1. The study revealed that school leaders and teachers are well-positioned to lead digital transformation initiatives, given their predominantly female composition, mid-career status, and strong academic qualifications. A substantial number of school heads fall within the 42–48 age range, while most teachers are aged 35–41, suggesting a workforce that balances maturity with adaptability. The high proportion of respondents with graduate-level education further supports the potential for successful integration of educational technologies into teaching and leadership practices.

2. Despite this readiness, school leaders and teachers did not perceive the impact of digital transformation in instructional leadership uniformly. Both groups rated its influence as moderate, but teachers consistently gave lower scores, particularly in areas involving technology-driven decision-making and digital collaboration. For instance, technology-driven decisions received a mean score of 2.90 from teachers versus 3.13 from school heads, and collaboration was rated 3.06 by teachers compared to 3.70 by school heads. These discrepancies point to possible gaps in leadership visibility, clarity of digital strategies, and the practical application of digital tools in everyday school operations.

3. Statistical analyses demonstrated that demographic variables—such as age, gender, educational attainment, and professional experience—had minimal to no significant influence on perceptions of digital transformation. This finding underscores the greater importance of institutional practices, school culture, and leadership behaviors over individual characteristics in driving successful digital integration.

4. The study identified critical areas requiring immediate attention, particularly in the domain of technology-related decision-making, which received some of the lowest scores from teachers. Additionally, a significant gap was found in professional development opportunities: fewer than 3% of teachers had received international training, and collaboration between leaders and staff on digital initiatives was limited. These findings highlight the need for more inclusive, high-quality, and context-specific training programs.

5. In conclusion, while the current educational workforce shows strong potential to embrace digital change, the success of digital transformation in instructional leadership depends

heavily on how effectively school leaders address key weaknesses in leadership approaches, training provision, and systemic implementation. Clear, transparent, and consistently communicated digital leadership strategies are essential to align institutional goals with actual practices and to ensure that digital transformation efforts are inclusive, effective, and sustainable.

V. Recommendations

Based on the conclusions drawn from the demographic profiles and statistical analyses, the following recommendations are proposed to enhance the effectiveness of digital transformation in instructional leadership:

1. **Leverage Mid-Career Expertise for Digital Leadership**

   Educational institutions should strategically utilize the strengths of their mid-career workforce by empowering both school heads and teacher-leaders to take on leadership roles in digital transformation initiatives. These professionals possess a balanced blend of experience and adaptability, making them well-suited to mentor less experienced colleagues and to champion sustained, school-wide integration of technology.

2. **Bridge the Training Exposure Gap Through Strategic Support**

   School leaders must actively address disparities in training opportunities by promoting equitable access to high-quality national and international ICT training programs for teachers. Collaborations with external stakeholders—including government agencies, educational technology providers, and academic institutions—can facilitate broader exposure and ensure that teachers are adequately equipped for the digital demands of 21st-century instruction.

3. **Enhance Professional Development Quality and Promote Shared Leadership**

   Professional development initiatives should focus on relevance, depth, and sustainability. Trainings must be responsive to real-world classroom and leadership contexts, incorporating hands-on practice, collaborative learning, and ongoing mentorship. Furthermore, schools should foster a culture of **shared leadership**, where digital transformation is a collective endeavor supported by transparent decision-making, regular communication, and co-planned ICT strategies between school heads and teachers.

4. **Reframe Leadership Assessment Around Digital Competency**

   Recruitment, development, and evaluation frameworks for school leaders should emphasize **demonstrated digital leadership competencies**—such as innovation facilitation, use of data for instructional decisions, and inclusive leadership practices—

rather than relying solely on demographic or tenure-based criteria. Leadership effectiveness should be measured by outcomes and impact on digital transformation, not by length of service or traditional credentials alone.

5. **Institutionalize Digital Leadership Within School Development Plans**Schools should formally incorporate digital transformation goals into their institutional development strategies. This includes clearly defined ICT integration targets, investment in digital infrastructure and human capital, and the establishment of robust systems for monitoring, evaluation, and continuous improvement. A cohesive and learner-centered digital leadership framework ensures that transformation efforts are aligned with broader educational goals and are sustainable over time.

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