

## Examining the Relationship Between Digital Pedagogy Competence and Work Performance of Educators

Andrea Nikka J. Navato<sup>1</sup>, Dr. Julio M. Cervantes<sup>2</sup>

Pangasinan State University – Open University Systems, Lingayen, Pangasinan, Philippines<sup>1,2</sup>

navatoandreanikka@gmail.com<sup>1</sup>, jmcervantes@psu.edu.ph<sup>2</sup>

### ABSTRACT

*This study examined the relationship between digital pedagogy competence and work performance among educators in selected public elementary and secondary schools in the Syrdarya Region and Tashkent City, Uzbekistan. Using a descriptive-correlational design, data were collected from 54 teachers through a validated questionnaire. Results showed that teachers had a high level of digital pedagogy competence ( $M = 3.93$ ) and a very high level of work performance ( $M = 4.66$ ). A statistically significant moderate positive relationship was found between digital pedagogy competence and work performance ( $\rho = 0.569$ ,  $p < 0.05$ ). Teacher profile variables were not significantly related to either competence or performance. The findings indicate that enhancing digital pedagogy competence may improve teaching effectiveness and overall work performance. A Digital Pedagogy Enhancement Program (DPEP) is recommended to support continuous professional development.*

**Keywords:** *Digital pedagogy competence, work performance, educators, instructional effectiveness, professional development, Uzbekistan.*

### INTRODUCTION

The rapid advancement of digital technology has transformed educational systems worldwide. Technology is no longer viewed merely as a supplementary instructional tool but has become an essential component of lesson planning, learner engagement, assessment, communication, and professional practice. Consequently, teachers are expected to develop competencies that enable them to effectively integrate digital technologies into teaching and learning processes.

Digital pedagogy competence extends beyond basic computer literacy and technical ICT skills. It encompasses the ability to design technology-enhanced instruction, facilitate online and blended learning, utilize digital assessment tools, and promote meaningful learner engagement through digital platforms. As educational systems continue to undergo digital transformation, teachers' competence in digital pedagogy has become increasingly important for instructional effectiveness.

In Uzbekistan, educational reforms have emphasized ICT integration and digital transformation to improve educational quality and prepare learners for a technology-driven society. However, variations in access to ICT infrastructure, professional development opportunities, and institutional support continue to influence teachers' digital competence. While previous studies have explored technology integration in education, limited empirical evidence

exists regarding the relationship between teachers' digital pedagogy competence and work performance within the Uzbek educational context.

This study sought to address this gap by examining the relationship between digital pedagogy competence and work performance among educators in selected public schools in Uzbekistan. Specifically, it aimed to determine teachers' levels of digital pedagogy competence and work performance and assess whether a significant relationship exists between these variables.

This study sought to answer the following questions:

1. What is the profile of the respondents in terms of:
  - Type of school;
  - Age;
  - Sex;
  - Highest educational attainment;
  - Teaching position;
  - Years of teaching experience;
  - Grade level taught; and
  - Seminars or trainings attended related to digital pedagogy?
2. What is the level of teachers' digital pedagogy competence in terms of:
  - Digital instructional design;
  - Online teaching and facilitation skills;
  - Use of digital tools and learning technologies;
  - Digital assessment and feedback; and
  - Learner engagement and interaction in digital environments?
3. What is the level of teachers' work performance in terms of:
  - Instructional delivery;
  - Classroom management and learning facilitation;
  - Assessment and feedback practices;
  - Learner engagement and support; and
  - Professional responsibility and work ethics?
4. Is there a significant relationship between teachers' digital pedagogy competence and work performance?
5. Is there a significant relationship between teachers' profile variables and digital pedagogy competence?
6. Is there a significant relationship between teachers' profile variables and work performance?
7. What capacity-building program may be proposed to enhance teachers' digital pedagogy competence and work performance?

## REVIEW OF RELATED LITERATURE

This study is anchored on the premise that teachers' digital pedagogy competence plays a vital role in enhancing work performance in technology-enhanced learning environments. Contemporary educational reforms emphasize integrating digital technologies into teaching, making digital competence an essential professional capability for educators. The literature suggests that teachers who effectively integrate technology, pedagogy, and content knowledge are better equipped to design meaningful learning experiences and improve instructional outcomes.

The study is primarily guided by the Technological Pedagogical Content Knowledge (TPACK) Framework by Punya Mishra and Matthew Koehler (2006), which emphasizes integrating technological, pedagogical, and content knowledge for effective teaching. The framework emphasizes that successful technology integration requires teachers to possess not only technical skills but also the pedagogical competence to apply technology meaningfully in instruction.

Digital pedagogy competence encompasses several dimensions, including digital instructional design, online teaching and facilitation, use of digital tools and learning technologies, digital assessment and feedback, and learner engagement in digital environments. Studies have shown that teachers with strong digital competence are better able to create interactive, learner-centered, and technology-supported learning experiences that improve student engagement and achievement.

Research likewise indicates that digital competence contributes positively to teacher effectiveness and work performance. Effective use of digital technologies enhances instructional delivery, classroom management, assessment practices, learner engagement, and professional productivity. Teachers who are confident in integrating technology are more adaptable to changing educational demands and are better prepared to support diverse learning needs.

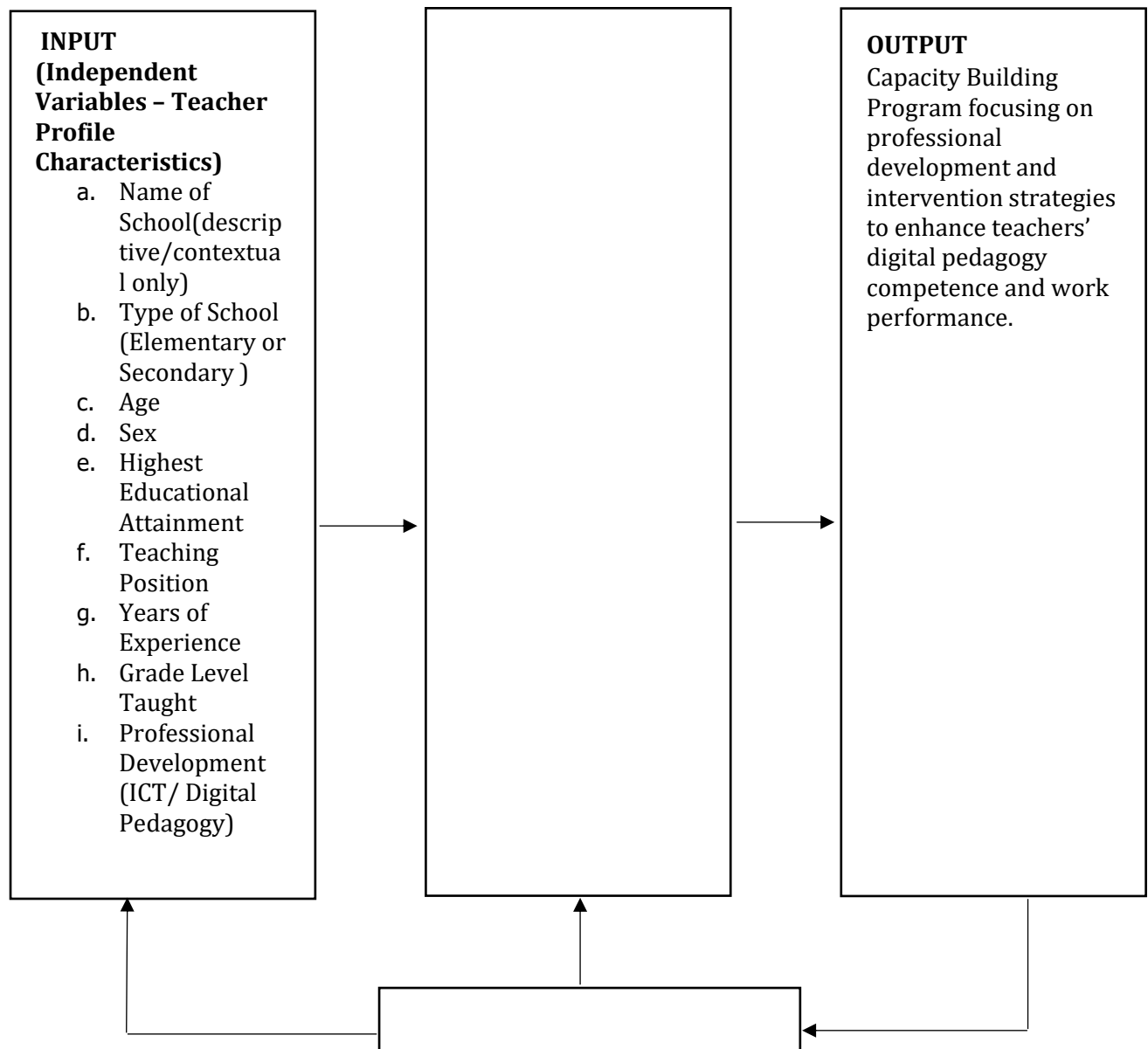
Professional development remains a critical factor in strengthening competence in digital pedagogy. Continuous training, mentoring, and collaborative learning opportunities help teachers improve their technological skills and instructional practices. Institutional support, access to ICT resources, and positive school leadership further influence the successful implementation of digital teaching strategies.

Several studies have reported a positive relationship between digital competence and teacher performance. Teachers who demonstrate higher levels of technological and pedagogical proficiency tend to exhibit greater instructional effectiveness, improved classroom practices, and stronger professional engagement. However, existing literature also suggests that teacher performance is influenced by multiple factors, including motivation, organizational support, access to resources, and opportunities for professional growth.

In the context of educational digitalization, particularly in developing and transitioning educational systems such as Uzbekistan, strengthening teachers' digital pedagogy competence

is essential for sustaining instructional quality and improving educational outcomes. The reviewed literature, therefore, supports the present study's investigation of the relationship between digital pedagogy competence and work performance and provides a basis for proposing interventions aimed at enhancing teachers' professional capabilities in technology-enhanced learning environments.

**Figure 1: Research Paradigm**



## METHODS

This study employed a descriptive-correlational research design to determine the level of digital pedagogy competence and work performance of teachers and to examine the relationships among the study variables. The descriptive method was used to assess teachers' profile characteristics, digital pedagogy competence, and work performance, while the correlational approach was utilized to determine whether significant relationships existed between teachers' profile variables, digital pedagogy competence, and work performance. The study was conducted in selected public elementary and secondary schools in the Syrdarya Region and Tashkent City, Uzbekistan, during the Academic Year 2025–2026. These locations were chosen because they represent varying educational contexts and levels of access to digital technologies, providing a meaningful setting for examining teachers' digital pedagogy competence in technology-enhanced learning environments.

The study's respondents comprised 54 public school teachers currently engaged in blended learning, technology-assisted instruction, or traditional teaching supplemented with digital tools. Teachers were selected through purposive sampling based on their involvement in technology-supported instruction, followed by random selection among qualified participants. Teachers from private schools, higher education institutions, vocational schools, and schools outside the selected regions were excluded from the study to maintain consistency in the research context.

A researcher-made questionnaire served as the primary data-gathering instrument. The questionnaire consisted of three parts: the respondents' profile, digital pedagogy competence, and work performance. Digital pedagogy competence was measured in terms of digital instructional design, online teaching and facilitation skills, use of digital tools and learning technologies, digital assessment and feedback, and learner engagement and interaction in digital environments. Work performance was assessed through instructional delivery, classroom management and learning facilitation, assessment and feedback practices, learner engagement and support, and professional responsibility and work ethics. The instrument underwent expert validation by specialists in education, educational technology, and research methodology. A pilot test was conducted to establish reliability, yielding acceptable Cronbach's alpha coefficients that indicated high internal consistency. Data were collected through printed and online survey forms to ensure accessibility and maximize participation.

Descriptive statistics, including frequency counts, percentages, and weighted means, were used to summarize respondent profiles and assess levels of digital pedagogy competence and work performance. Correlational statistics, particularly the Spearman Rank-Order Correlation Coefficient, were used to assess relationships between digital pedagogy competence and work performance, as well as between profile variables and the study variables. All hypotheses were tested at the 0.05 level of significance. The results served as the basis for developing a proposed Digital Pedagogy Enhancement Program (DPEP) to strengthen teachers' digital competencies and improve instructional performance.

Ethical considerations were strictly observed throughout the study. Permission to conduct the research was secured from the concerned school administrators and educational authorities. Participation was voluntary, and informed consent was obtained from all respondents prior to data collection. Respondents were assured that their identities and responses would remain confidential and would be used solely for research purposes. Data were securely stored, anonymized during analysis, and reported in aggregate form to protect participants' privacy. Participants were informed of their right to decline participation or withdraw from the study at any stage without penalty. The findings will be shared with relevant educational stakeholders to support teacher professional development initiatives and digital education reforms in Uzbekistan.

## RESULTS AND DISCUSSION

The study presented the results of the data analysis and the corresponding discussion based on the data gathered.

**Table 1: Summary of the Profile of the Teacher-Respondents (N = 54)**

| Profile                                                        | Result                                                  | Frequencies | Percentage |
|----------------------------------------------------------------|---------------------------------------------------------|-------------|------------|
| <b>School Region/City</b>                                      | Syradarya Region                                        | 32          | 59.26%     |
| <b>Type of School</b>                                          | Public Secondary School                                 | 42          | 77.78%     |
| <b>Gender</b>                                                  | Female                                                  | 42          | 77.78%     |
| <b>Educational Attainment</b>                                  | Bachelor's Degree                                       | 38          | 70.37%     |
| <b>Teaching Position</b>                                       | Classroom Teacher                                       | 51          | 94.44%     |
| <b>Teaching Experience</b>                                     | 1-5 years                                               | 18          | 33.33%     |
| <b>Grade level(s) taught</b>                                   | Mixed / Multiple levels                                 | 44          | 81.48%     |
| <b>Seminars/Trainings Attended Related to Digital Pedagogy</b> | ICT Integration Workshops (Regional/District/Classroom) | 12          | 22.22%     |

Table 1 shows the profile of the teacher-respondents included in the study. The findings reveal that the majority of respondents were from the Syrdarya Region (59.26%), while the remainder were from Tashkent City (40.74%). Most respondents were employed in public secondary schools (77.78%), indicating that secondary-level educators constituted the largest group of participants in the study. This suggests that technology integration practices are highly relevant in secondary education settings, where instructional content often requires diverse digital resources and learning technologies.

In terms of demographic characteristics, the majority of respondents were female (77.78%), reflecting the predominance of women in the teaching profession. Most teachers

possessed a bachelor's degree (70.37%), while a smaller proportion held master's degrees and postgraduate qualifications. Furthermore, the majority served as classroom teachers (94.44%), indicating that the respondents were directly involved in daily instructional delivery and learner engagement activities. Regarding teaching experience, the largest group had between 1 and 5 years of experience (33.33%), suggesting a relatively young and adaptable teaching workforce capable of embracing emerging educational technologies.

The findings also indicate that most respondents taught multiple grade levels (81.48%), requiring flexibility in instructional approaches and digital pedagogy practices. Moreover, ICT Integration Workshops (22.22%) emerged as the most frequently attended professional development activity related to digital pedagogy. This demonstrates that teachers have been exposed to various training opportunities to enhance their technology integration skills and instructional competence in digital learning environments.

The profile of the respondents suggests that the participating teachers represent diverse educational backgrounds and professional experiences while sharing a common involvement in technology-supported instruction. Although differences were observed across school locations, educational attainment, teaching experience, and training participation, subsequent statistical analyses revealed that these profile variables did not significantly influence teachers' digital pedagogy competence or work performance. This finding implies that effective digital pedagogy and instructional performance are not primarily determined by demographic or professional characteristics but may instead be influenced by continuous professional development, access to resources, institutional support, and practical experience in technology-enhanced teaching environments.

**Table 2: Summary of the Level of Teachers' Digital Pedagogy Competence**

| Level of Teachers' Digital Pedagogy Competence | Mean        | Description  |
|------------------------------------------------|-------------|--------------|
| Digital Instructional Design                   | 4.06        | Agree        |
| Online Teaching and Facilitation Skills        | 3.78        | Agree        |
| Use of Digital Tools and Learning Technologies | 4.07        | Agree        |
| Digital Assessment and Feedback                | 3.9         | Agree        |
| Learner Engagement in Digital Environments     | 3.95        | Agree        |
| <b>Overall Mean</b>                            | <b>3.93</b> | <b>Agree</b> |

Legend: 4.51–5.00 = Strongly Agree; 3.51–4.50 = Agree; 2.51–3.50 = Moderately Agree; 1.51–2.50 = Disagree; 1.00–1.50 = Strongly Disagree

Table 2 shows that teachers demonstrated a generally high level of digital pedagogy competence, as reflected by the overall mean of 3.93 (Agree). The findings indicate that the respondents possess the necessary competencies to effectively integrate digital technologies into teaching and learning processes. This suggests that teachers are capable of utilizing digital resources, facilitating technology-enhanced instruction, and supporting learners in digital environments.

Among the dimensions, Use of Digital Tools and Learning Technologies obtained the highest mean (4.07), followed closely by Digital Instructional Design (4.06). These findings imply that teachers are confident in using various educational technologies and can incorporate these tools into lesson planning and instructional delivery. The result highlights teachers' readiness to adopt digital innovations and reflects their ability to align technology use with instructional objectives.

Learner Engagement in Digital Environments had a mean of 3.95, indicating that teachers can use technology to encourage participation and collaboration among learners. Likewise, Digital Assessment and Feedback received a mean of 3.90, suggesting that teachers are competent in using digital platforms to assess student performance and provide feedback. However, these areas may still benefit from additional professional development focused on data-driven assessment practices and learner analytics.

The lowest mean was recorded for Online Teaching and Facilitation Skills (3.78), although it remained within the Agree category. This finding suggests that teachers may encounter challenges in facilitating interactive online discussions, sustaining student participation, and managing virtual learning environments. Similar studies have emphasized that effective online facilitation requires not only technological knowledge but also strong pedagogical and communication skills (Garrison et al., 2010; Falloon, 2020).

The findings suggest that teachers possess a favorable level of digital pedagogy competence across the identified dimensions. The results support the Technological Pedagogical Content Knowledge (TPACK) framework of Mishra and Koehler (2006), which emphasizes integrating technology, pedagogy, and content knowledge for effective teaching. Teachers demonstrated particular strengths in the use of digital tools and learning technologies as well as digital instructional design, indicating their readiness to integrate technology into instructional practice. However, the relatively lower ratings in online teaching and facilitation skills, digital assessment and feedback, and learner engagement in digital environments suggest areas that may benefit from further enhancement. These findings highlight the importance of continuous professional development programs to strengthen teachers' competencies in facilitating online learning, using assessment data effectively, and promoting meaningful learner engagement in technology-enhanced educational settings.

**Table 3 Summary of the Level of Teachers' Work Performance**

| Level of Teachers' Work Performance               | Mean        | Description   |
|---------------------------------------------------|-------------|---------------|
| A. Instructional Delivery                         | 4.48        | Always        |
| B. Classroom Management and Learning Facilitation | 4.68        | Always        |
| C. Assessment and Feedback Practices              | 4.57        | Always        |
| D. Learner Engagement and Support                 | 4.65        | Always        |
| E. Professional Responsibility and Work Ethics    | 4.73        | Always        |
| <b>OVERALL MEAN</b>                               | <b>4.66</b> | <b>Always</b> |

Legend : Legend: 1.00-1.80 (Never); 1.81-2.60 (Rarely); 2.61-3.40 (Sometimes); 3.41-4.20 (Often); 4.21-5.00 (Always)

Table 3 presents the summary of teachers' work performance across the five dimensions examined in the study. The results show an overall mean of 4.66, described as Always, indicating that teachers consistently perform their professional duties and responsibilities at a very high level. The findings suggest that teachers regularly demonstrate effectiveness in instructional delivery, classroom management and learning facilitation, assessment and feedback practices, learner engagement and support, and professional responsibility and work ethics.

Among the dimensions, Professional Responsibility and Work Ethics obtained the highest mean (4.73), followed by Classroom Management and Learning Facilitation (4.68) and Learner Engagement and Support (4.65). These findings indicate that teachers exhibit strong commitment to professional standards, ethical conduct, accountability, and continuous improvement. Such qualities are essential in maintaining instructional quality, fostering positive learning environments, and supporting the achievement of educational goals.

The high rating in classroom management and learning facilitation suggests that teachers are capable of maintaining organized, supportive, and productive learning environments. Effective classroom management enables teachers to maximize instructional time, encourage active participation, and create conditions that promote student learning and academic success. Similarly, the favorable rating in learner engagement and support demonstrates teachers' consistent efforts to guide, motivate, and assist learners in addressing their academic needs and challenges.

Assessment and Feedback Practices obtained a mean of 4.57, indicating that teachers regularly monitor student progress and provide feedback to support learning improvement. This

finding reflects teachers' commitment to evaluating learning outcomes and using assessment information to guide instructional decisions. Although slightly lower than the top-rated dimensions, the result still demonstrates strong performance in facilitating student growth and achievement.

The lowest mean was recorded for Instructional Delivery (4.48), although it remained within the Always category. This indicates that teachers consistently deliver lessons effectively and communicate learning content clearly. However, the result also suggests opportunities for further enhancement through the integration of innovative teaching approaches, differentiated instruction, active learning strategies, and technology-supported pedagogical practices.

The findings demonstrate that teachers maintain a very high level of work performance across all dimensions. Strengths are particularly evident in professional responsibility, classroom management, and learner support, highlighting teachers' dedication to creating positive and effective learning experiences. These results further suggest that sustained professional development initiatives focusing on instructional innovation, assessment practices, and learner-centered teaching strategies may contribute to the continued enhancement of teacher effectiveness and improved educational outcomes.

**Table 4 Significant relationship between teachers' digital pedagogy competence and their work performance**

| Variable                                                   | Correlation Coefficient ( $\rho$ ) | p-value | Interpretation     |
|------------------------------------------------------------|------------------------------------|---------|--------------------|
| Teachers' Digital Pedagogy Competence and Work Performance | 0.569                              | 0.001   | Highly Significant |

Note :  $p < .05$  – Significant;  $p < .01$  – Highly Significant;  $p > .05$  – Not Significant

The results reveal a moderate positive relationship ( $\rho = 0.569$ ,  $p = 0.001$ ) between teachers' digital pedagogy competence and their work performance. This indicates that higher levels of digital competence are associated with better teaching performance. While the relationship is statistically significant, its moderate strength suggests that digital competence is an important, but not the sole, determinant of teachers' effectiveness. Other factors—such as motivation, institutional support, access to ICT resources, and opportunities for professional development—also play a crucial role in influencing work performance.

This finding supports the theoretical frameworks of Technological Pedagogical Content Knowledge (TPACK) and DigCompEdu, which emphasize that integrating technology into pedagogy enhances teaching effectiveness. Teachers who are proficient in digital instructional design, online facilitation, and digital assessment are better equipped to deliver instruction, engage learners, and manage classroom activities efficiently.

Furthermore, the results are consistent with previous studies highlighting the positive association between digital competence and teaching effectiveness. For instance, Gudmundsdottir and Hatlevik (2018) and Trust and Whalen (2020) found that teachers with higher digital skills demonstrate improved instructional practices and greater learner engagement. Similarly, research indicates that the use of digital tools enhances lesson delivery, assessment strategies, and overall student outcomes.

The findings suggest that strengthening teachers' digital pedagogy competence can enhance work performance, particularly in technology-enhanced learning environments. As education continues to integrate digital technologies, teachers' ability to effectively use these tools becomes increasingly critical to delivering quality instruction.

However, given the relationship's moderate strength, it is evident that enhancing digital competence alone is insufficient. Therefore, continuous professional development and targeted capacity-building programs—along with adequate institutional support and resource provision—are essential to further improve teachers' competence and overall teaching effectiveness.

**Table 5: Significant relationship between teachers' profile variables and Digital Pedagogy Competence**

| Teacher Profile Variables         | Correlation Coefficient ( $\rho$ / rpb) | p-value | Interpretation  |
|-----------------------------------|-----------------------------------------|---------|-----------------|
| a. Type of School                 | 0.113                                   | 0.414   | Not Significant |
| b. Age                            | 0.113                                   | 0.415   | Not Significant |
| c. Sex                            | 0.085                                   | 0.539   | Not Significant |
| d. Highest Educational Attainment | -0.033                                  | 0.81    | Not Significant |
| e. Teaching Position              | -0.093                                  | 0.505   | Not Significant |
| f. Years of Teaching Experience   | -0.005                                  | 0.972   | Not Significant |
| g. Grade Level Taught             | 0.155                                   | 0.262   | Not Significant |

Legend: rpb – Point-biserial correlation coefficient;  $\rho$  (rho) – Spearman rank-order correlation coefficient; p-value – probability value;  $p < 0.05$  – Significant;  $p > 0.05$  – Not Significant. Significance level = 0.05.

The results in Table 5 indicate that there is no significant relationship between teachers' profile variables and their digital pedagogy competence, as all computed p-values exceed the 0.05 significance level. Variables such as type of school, age, sex, highest educational attainment, teaching position, years of teaching experience, and grade level taught yielded negligible correlation coefficients, suggesting that these factors do not statistically influence teachers' level of digital competence. The correlation values, ranging from slight positive to

slight negative, further confirm that any observed associations are too weak to be considered meaningful or predictive.

These findings imply that digital pedagogy competence is not dependent on demographic or professional characteristics but is instead a skill-based and practice-oriented competency. This supports the view that such competence is developed through training, exposure, and continuous professional development rather than being an inherent or static attribute. Similar perspectives in existing literature emphasize that competencies are shaped by learning opportunities and experience rather than personal profiles.

Moreover, prior studies affirm that factors such as access to ICT resources, institutional support, and engagement in professional development programs have a stronger influence on teachers' digital competence than age, gender, or years of service (Tondeur et al., 2017; Scherer et al., 2021). This also challenges common assumptions about "digital natives," highlighting that competence in digital pedagogy is acquired through intentional practice rather than generational differences.

The absence of significant relationships further suggests that all teachers, regardless of background, have equal potential to develop competence in digital pedagogy. This underscores the importance of providing equitable and sustained capacity-building initiatives, such as ICT training, mentoring, and professional learning communities.

The findings reinforce the idea that digital pedagogy competence is universally attainable and should be strengthened through inclusive, competency-based professional development programs rather than relying on demographic predictors.

**Table 6 Significant Relationship between Teachers' Profile Variables and Work Performance**

| Teacher Profile Variables      | Coefficient | Value   | p-value | Interpretation  |
|--------------------------------|-------------|---------|---------|-----------------|
| Type of School                 | rpb         | 0.202   | 0.142   | Not Significant |
| Age                            | $\rho$      | -0.097  | 0.486   | Not Significant |
| Sex                            | rpb         | 0.1     | 0.472   | Not Significant |
| Highest Educational Attainment | $\rho$      | 0.106   | 0.448   | Not Significant |
| Teaching Position              | $\rho$      | -0.0168 | 0.223   | Not Significant |
| Years of Teaching Experience   | $\rho$      | -0.075  | 0.59    | Not Significant |
| Grade Level Taught             | $\rho$      | 0.185   | 0.179   | Not Significant |

Legend: rpb – Point-biserial correlation coefficient;  $\rho$  (rho) – Spearman rank-order correlation coefficient; p-value – probability value;  $p < 0.05$  – Significant;  $p > 0.05$  – Not Significant. Significance level = 0.05.

Table 6 shows that there is no significant relationship between teachers' profile variables and their work performance, as all computed p-values are greater than the 0.05 level of significance. This indicates that teachers' work performance is not significantly influenced by factors such as type of school, age, sex, highest educational attainment, teaching position, years of teaching experience, and grade level taught. The weak and negligible correlation coefficients further suggest that demographic and professional characteristics have minimal influence on how teachers perform their duties and responsibilities.

The findings imply that work performance is primarily shaped by professional competencies, instructional practices, and workplace conditions rather than personal characteristics. Regardless of age, educational attainment, or years of experience, teachers can demonstrate high levels of effectiveness when provided with appropriate opportunities for professional growth and institutional support. Previous studies have shown that teacher effectiveness is more closely associated with motivation, continuous professional development, leadership support, and access to educational resources than with demographic factors alone.

The absence of significant relationships highlights the importance of creating supportive learning and working environments that enable teachers to continuously improve their instructional practices. Equitable access to training programs, mentoring initiatives, collaborative learning opportunities, and technology resources can help teachers maintain and enhance their performance regardless of their background or professional profile.

These findings suggest that sustaining high levels of teacher performance requires a focus on competency development, instructional innovation, and organizational support. As teachers already demonstrate strong levels of digital pedagogy competence and performance, efforts should focus on strengthening existing capabilities through continuous professional development. Consequently, the proposed capacity-building program aims to sustain, enrich, and advance teachers' competencies in digital pedagogy and technology-integrated instruction to support quality teaching and learning in evolving educational environments.

## CONCLUSION AND RECOMMENDATIONS

The study concluded that the respondents were predominantly female teachers, most of whom held bachelor's degrees and were employed in public secondary schools in the Syrdarya Region and Tashkent City, Uzbekistan. The teachers represented diverse levels of teaching experience, grade levels taught, and participation in ICT-related seminars and trainings. Although many respondents had attended professional development activities related to digital pedagogy, these demographic and professional characteristics did not significantly influence their digital pedagogy competence or work performance.

Teachers demonstrated a high level of digital pedagogy competence across digital instructional design, online teaching and facilitation skills, use of digital tools and learning technologies, digital assessment and feedback, and learner engagement in digital environments. The strongest competencies were observed in the use of digital tools and instructional design, indicating that teachers are capable of integrating technology into teaching practices. However,

online teaching and facilitation skills obtained the lowest rating among the dimensions, suggesting opportunities for further enhancement in managing virtual learning environments and sustaining student participation.

The findings also revealed a very high level of work performance among teachers in terms of instructional delivery, classroom management, and learning facilitation, assessment and feedback practices, learner engagement and support, and professional responsibility and work ethics. Professional responsibility and work ethics emerged as the highest-rated dimension, reflecting teachers' commitment to quality instruction, accountability, and continuous professional growth. These results suggest that teachers consistently perform their responsibilities effectively despite the demands of technology-enhanced learning environments.

A moderate positive and statistically significant relationship was found between digital pedagogy competence and work performance. This indicates that teachers with stronger digital pedagogy competencies tend to demonstrate better work performance. The findings highlight the important role of digital competence in supporting instructional effectiveness, learner engagement, classroom management, and overall professional performance. However, the moderate strength of the relationship also suggests that factors such as motivation, institutional support, leadership, and access to resources contribute to teacher effectiveness.

The study further established that teacher profile variables, including age, sex, educational attainment, teaching position, years of teaching experience, type of school, and grade level taught, were not significantly related to either digital pedagogy competence or work performance. These findings suggest that both competence and performance are influenced more by continuous learning opportunities, professional practice, and supportive educational environments than by demographic or professional characteristics alone.

Based on these findings, it is recommended that school administrators and education leaders continue to provide inclusive, sustained professional development opportunities focused on digital pedagogy. Particular attention should be given to strengthening online teaching and facilitation skills, digital assessment strategies, learner engagement techniques, and the effective use of emerging educational technologies. Schools should also ensure adequate ICT infrastructure, technical support, and access to digital resources that enable teachers to integrate technology meaningfully into instruction.

Furthermore, mentoring programs, professional learning communities, coaching initiatives, and collaborative training activities should be strengthened to support continuous teacher growth. The proposed Digital Pedagogy Enhancement Program (DPEP) may be implemented and regularly evaluated to sustain and further advance teachers' competencies and work performance. Future studies may expand the scope of the research by including larger samples, additional regions, private schools, and other factors such as school leadership, institutional support, digital infrastructure, and student learning outcomes to provide a more comprehensive understanding of digital pedagogy and teacher effectiveness in Uzbekistan.

## ACKNOWLEDGEMENT

First and foremost, the researcher expresses her deepest gratitude to God Almighty for His abundant blessings, wisdom, guidance, and strength throughout the conduct and completion of this study. His unfailing grace served as a constant source of inspiration and perseverance in overcoming every challenge encountered during this academic endeavor. The researcher extends her sincere appreciation to **Pangasinan State University – Open University Systems (PSU-OUS)** for providing quality graduate education, academic resources, and a supportive learning environment that made this research possible. Special recognition and heartfelt gratitude are given to **Dr. Julio M. Cervantes**, Thesis Adviser, for his invaluable guidance, expertise, patience, and unwavering support from the conceptualization of the study until its completion. His insightful suggestions, constructive criticisms, and dedication to academic excellence significantly contributed to the successful realization of this research. The researcher also expresses her sincere appreciation to the members of the panel of examiners and thesis committee for their professional insights, constructive feedback, and valuable recommendations that enhanced the quality and rigor of this study. Special thanks are likewise extended to **Mr. Gerald Pagodpod**, Critic Reader, for his careful review, thoughtful comments, and meaningful suggestions that greatly improved the content and presentation of this research work. With profound love and gratitude, the researcher acknowledges her beloved parents, **Mommy Salva Navato** and **Daddy Andronico Navato**, for their unconditional love, endless sacrifices, unwavering support, encouragement, and prayers. Their faith and confidence in her abilities have been her greatest source of motivation and strength throughout this journey. The researcher is also deeply grateful to her siblings, **Simon Andrew Navato** and **Sheen Martin Navato**, for their love, encouragement, and constant support, which provided inspiration and comfort during the completion of this study. Heartfelt appreciation is extended to her friends and colleagues for their encouragement, understanding, and moral support. Special thanks are given to **Kuya Tee Jay** for his invaluable assistance, guidance, and efforts in organizing and improving various aspects of this research. Finally, the researcher gratefully acknowledges all individuals who, in one way or another, contributed to the successful completion of this study. Their support, encouragement, and assistance are sincerely appreciated and will always be remembered.

## AI DECLARATION STATEMENT

AI-supported tools helped with grammar and structure in creating this article. No AI tools were used to collect, analyze, or interpret data; all authors are credited for their academic contributions.

## REFERENCES

- Aagaard, T. (2021). *Digital technologies and teacher professional development. Teaching and Teacher Education*, 102, 103322. <https://doi.org/10.1016/j.tate.2021.103322>
- Adedoyin, O. B., & Soykan, E. (2020). *COVID-19 pandemic and online learning: The challenges. Interactive Learning Environments*, 29(6), 1–13. <https://doi.org/10.1080/10494820.2020.1813180>

- Afonso, A. (2021). *The future of digital education: Moving beyond emergency remote teaching*. *Educational Technology Research and Development*, 69, 1–5.  
<https://doi.org/10.1007/s11423-021-09978-5>
- Ahmad, T. (2020). *Teacher digital literacy in the 21st century*. *Education and Information Technologies*, 25, 1–20. <https://doi.org/10.1007/s10639-020-10174-x>
- Akgün, S., & Atıcı, B. (2021). *Examining digital competence of teachers in the digital age*. *European Journal of Educational Research*, 10(1), 483–495.  
<https://doi.org/10.12973/eu-jer.10.1.483>
- Alam, A. (2020). *Technology and digital pedagogy in the global context*. *Educational Technology Review*, 28, 1–14. <https://doi.org/10.2139/ssrn.3778991>
- Almusharraf, N. (2021). *Teachers' digital competence: A systematic review*. *Education and Information Technologies*, 26, 1109–1134. <https://doi.org/10.1007/s10639-020-10359-4>
- Alshammari, A. (2020). *ICT integration and teaching effectiveness*. *Journal of Technology and Teacher Education*, 28(4), 475–497. <https://www.learntechlib.org/p/216904/>
- Altinay, F., Dagli, G., & Altinay, Z. (2018). *Digital transformation in education: Technological and pedagogical competence*. *Journal of Education and Practice*, 9(4), 80–85. <https://files.eric.ed.gov/fulltext/EJ1170442.pdf>
- Amin, M., Rahman, A. R., & Ahmed, M. (2020). *Teachers' competence and instructional performance*. *International Journal of Instruction*, 13(2), 1–16.  
<https://doi.org/10.29333/iji.2020.1321a>
- An, Y., & Reigeluth, C. (2020). *Investigating the implementation of digital pedagogy in K–12*. *Computers & Education*, 158, 103–114.  
<https://doi.org/10.1016/j.compedu.2020.103998>
- Anderson, T. (2020). *The evolving role of teachers in digital learning*. *Journal of Online Learning Research*, 6(1), 5–22. <https://www.learntechlib.org/p/216885/>
- Arifin, Z. (2021). *Factors influencing teacher performance in 21st-century classrooms*. *Journal of Education Research*, 15(3), 122–136.  
<https://doi.org/10.5296/jer.v15i3.18211>
- Arkorful, V., & Abaidoo, N. (2020). *Online learning and teacher adaptation*. *International Journal of Education and Development*, 7(3), 102–115.  
<https://doi.org/10.18768/ijaedu.2020.7310>

- Aslan, A., & Zhu, C. (2021). *Teachers' digital competence: A critical review*. *Education and Information Technologies*, 26(3), 4053–4074.  
<https://doi.org/10.1007/s10639-021-10416-6>
- Bal, M. S., & Şimşek, Ö. (2021). *Teachers' digital literacy levels and the integration of technology*. *Journal of Education and Learning*, 10(3), 31–42.  
<https://doi.org/10.5539/jel.v10n3p31>
- Baran, E., & Uygun, E. (2020). *Professional development for digital teaching*. *Journal of Technology and Teacher Education*, 28(4), 511–524.  
<https://www.learntechlib.org/p/216906/>
- Beetham, H. (2020). *Digital pedagogy and teaching innovation*. *Teaching in Higher Education*, 25(4), 395–410. <https://doi.org/10.1080/13562517.2020.1723538>
- Blau, I., Peled, Y., & Nusan, A. (2020). *Technological pedagogical knowledge and teacher self-efficacy*. *Journal of Computer Assisted Learning*, 36(2), 145–159.  
<https://doi.org/10.1111/jcal.12387>
- Bond, M. (2020). *Digital assessment and remote learning during COVID-19*. *Educational Technology Research and Development*, 68, 319–344.  
<https://doi.org/10.1007/s11423-020-09823-7>
- Cabero-Almenara, J., Barroso-Osuna, J., & Palacios-Rodríguez, A. (2020). *Measuring digital competence of educators*. *Education Sciences*, 10(9), 1–15.  
<https://doi.org/10.3390/educsci10090223>
- Cabero-Almenara, J., & Palacios-Rodríguez, A. (2021). *Digital competence of educators using DigCompEdu*. *Education Sciences*, 11(4), 141.  
<https://doi.org/10.3390/educsci11040141>
- Cohen, L., Manion, L., & Morrison, K. (2018). *Research methods in education* (8th ed.). Routledge. <https://doi.org/10.4324/9781315456539>
- Darling-Hammond, L. (2020). *Teacher effectiveness and student outcomes*. *Educational Researcher*, 49(3), 141–160. <https://doi.org/10.3102/0013189X20907162>
- European Commission. (2020). *DigCompEdu: European framework for the digital competence of educators*. Publications Office of the European Union.  
[https://joint-research-centre.ec.europa.eu/digcompedu\\_en](https://joint-research-centre.ec.europa.eu/digcompedu_en)
- Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, M. (2020). *Emergency remote teaching vs digital pedagogy*. *Educause Review*, 27(1), 1–15.

---

<https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning>

International Society for Technology in Education. (2018). *ISTE standards for educators*.  
<https://www.iste.org/standards/for-educators>

Koehler, M. J., & Mishra, P. (2009). *TPACK: Technological pedagogical content knowledge*.  
*Contemporary Issues in Technology and Teacher Education*, 9(1), 60–70.  
<https://www.learntechlib.org/p/29544/>

Ministry of Digital Technologies of Uzbekistan. (2023). *National digital transformation strategy 2023–2030*. <https://digital.uz>

Ministry of Public Education of Uzbekistan. (2020). *Digital education modernization initiatives*. <https://www.uzedu.uz>

OECD. (2020). *Teachers for 21st-century learning: Teaching effectiveness indicators*.  
OECD Publishing. <https://www.oecd.org/education/>

Redecker, C. (2020). *European framework for the digital competence of educators (DigCompEdu)*. Publications Office of the European Union.  
<https://publications.jrc.ec.europa.eu/repository/handle/JRC107466>

Stronge, J. (2018). *Qualities of effective teachers* (3rd ed.). ASCD.  
<https://www.ascd.org/books/qualities-of-effective-teachers-3rd-edition>

UNESCO. (2020). *Digitalization of education in Central Asia: Uzbekistan country report*.  
<https://unesdoc.unesco.org>

World Bank. (2022). *Education digital innovation in Uzbekistan: Reform assessment report*. <https://www.worldbank.org/en/country/uzbekistan>

Yuldashev, A., & Turakulov, A. (2021). *Digital competence of teachers in Uzbekistan*.  
*Central Asian Journal of Education*, 5(1), 45–58.  
<https://doi.org/10.47689/caje.v5i1.214>