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Digital Competence, Learning Innovation, and Work Motivation as Determinants of Teachers' Performance

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ABSTRACT

Teacher performance is a crucial factor influencing educational quality, especially throughout digital transformation and pedagogical progress. This study, based on human capital theory, innovation diffusion theory, and motivational psychology, examines the impact of digital competence, learning innovation, and work motivation on the performance of junior high school teachers in Aceh Tamiang Regency, Indonesia. A quantitative explanatory design was utilized, employing 210 teachers chosen by proportional random selection. Data were gathered utilizing validated questionnaires and examined by path analysis. The findings indicate that digital competence, learning innovation, and job motivation each exert a substantial beneficial influence on instructors' performance ($p < 0.05$). Of these variables, work motivation exhibits the most significant direct impact, succeeded by digital competence and learning innovation. The concurrent analysis reveals that the three predictors collectively account for a significant percentage of the variance in teachers' performance, hence validating the strength of the proposed conceptual framework. These findings underscore the significance of a cohesive teacher development strategy that enhances technology proficiency, fosters educational creativity, and maintains motivational support. The study enhances the literature on educational effectiveness by presenting an empirically based model of teacher performance that encapsulates the integrated roles of competence, creativity, and motivation in the context of educational digitalization.

1. Introduction

current global education systems are being redefined by the relationship of technological innovation, educational progress, and organizational change(Basilotta-Gómez-Pablos et al., 2022). These interconnected factors are transforming school operations, the delivery of learning, and the assessment of institutional effectiveness(Cabero-Almenara et al., 2022). In this changing environment, instructors play a crucial role, acting as both facilitators of learning and essential agents in maintaining the efficiency and adaptability of educational institutions(Rahimi, 2023). Their responsibilities include curricular innovation, data-informed decision-making, and fostering collaborative professional environments, in addition to classroom instruction(Sulistiani & Dewi,

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2024). As a result, teacher performance has emerged as a pivotal emphasis in educational research and policy discussions(Montilla et al., 2023). It embodies a multifaceted concept that amalgamates personal proficiency, vocational dedication, and innovative potential, while also illustrating the impact of organizational support structures, institutional culture, and motivating factors(Marwan et al., 2024). Comprehending teacher performance through this comprehensive perspective underscores the necessity of synchronizing professional development, technological incorporation, and school administration to improve instructional quality and institutional robustness in a swiftly evolving global educational landscape(Tzafilkou et al., 2023).

Teacher performance can be thoroughly understood by integrating insights from various essential theoretical frameworks that elucidate the interplay of professional competence, motivation, and creativity within educational environments(Stumbrienė et al., 2023). Human capital theory emphasizes the significance of investing in educators' knowledge, skills, and professional abilities as essential factors influencing individual productivity and institutional efficacy(Martínez-Pérez et al., 2022). From this viewpoint, continuous professional development and skill augmentation are crucial for enhancing teaching quality and learning outcomes(Meng, 2023). Theory of organizational behaviour underscores the significance of both intrinsic and extrinsic motivation in influencing teachers' work attitudes, job satisfaction, and performance, indicating that supportive leadership and a positive organizational culture can bolster commitment and productivity(Harrison et al., 2022).

Innovation diffusion theory analyses the adoption and integration of new instructional technologies and pedagogical methodologies by educators, demonstrating the dynamic process by which educational innovation proliferates inside institutions(Alam, 2023). Ultimately, self-determination theory offers a psychological framework for comprehending how autonomy, competence, and relatedness affect teachers' intrinsic motivation and involvement in their professional responsibilities(Fomba et al., 2022). The integration of these theories demonstrates that teacher performance is a multifaceted construct influenced by interconnected technological, pedagogical, organizational, and psychological elements(Obidovna, 2024). This synthesis highlights the necessity for comprehensive strategies in educational management that concurrently enhance professional ability, cultivate motivation, and encourage innovation-oriented teaching methodologies(Pliushch & Sorokun, 2022).

In the context of digital transformation in education, digital competence has become an essential element of teachers' professional capital, significantly influencing their capacity to adapt, innovate, and maintain instructional quality in technology-enhanced learning environments(da Silva Bueno et al., 2023). According to the TPACK (Technological Pedagogical Content Knowledge) framework, digital competence encompasses more than the simple acquisition of technical skills; it requires the intricate amalgamation of technological knowledge, pedagogical proficiency, and subject-matter expertise to create and implement effective learning experiences(Jiménez Sierra et al., 2023). Educators exhibiting robust digital competence are adept at utilizing technical resources and connecting them with instructional objectives and student requirements, thus fostering adaptable, interactive, and learner-centred educational settings(Schmid et al., 2024).

Such teachers are better at utilizing digital resources to customize education, promote collaboration, and elevate learner engagement—essential characteristics of effective 21st-century teaching(Yue et al., 2024). Furthermore, elevated digital competence enhances teachers' professional efficacy and confidence, enabling them to manage technological transformations, engage in ongoing innovation, and facilitate institutional digitalization initiatives(Ong & Annamalai, 2023). Digital competence serves as both a personal skill and an organizational resource that supports the success of educational reform efforts(Handayani et al., 2023).

Learning innovation serves as a pathway for transforming competence into practice(Bahtiar et al., 2023). Based in the propagation of innovation idea, learning innovation signifies educators' readiness to embrace novel instructional models, explore pedagogical tactics, and foster a culture of ongoing enhancement(Su, 2023). Innovative teachers are more inclined to establish constructivist learning settings that enhance student engagement and facilitate higher-order thinking, ultimately improving instructional quality(Zhao, 2024).

Concurrently, work motivation persists as a fundamental psychological catalyst for teacher performance(Christodoulou & Angeli, 2022). According to self-determination theory and expectation theory, motivated educators exhibit enhanced commitment, perseverance, and professional accountability(Utomo et al., 2024). Motivation not only affects teachers' everyday performance but also impacts their willingness to participate in professional development, embrace digital tools, and maintain new practices. While other studies have investigated these variables separately, there is a paucity of research focusing on their combined impact on teacher effectiveness, especially in the regional contexts of developing nations(Kholifah et al., 2024). The relationship between digital competence, learning innovation, and job motivation indicates a holistic theoretical framework wherein technological proficiency, pedagogical ingenuity, and psychological dedication together influence professional efficacy(Irwanto et al., 2022).

In junior high schools within Aceh Tamiang Regency, Indonesia, current changes prioritizing digital literacy and innovative pedagogy create a pertinent backdrop for analysing this integrated paradigm. Nonetheless, variations in teachers' abilities, opportunities for innovation, and motivational support suggest that performance outcomes are inconsistent among schools.

This study establishes and evaluates a conceptual framework identifying digital competence, learning innovation, and job motivation as primary determinants of teachers' effectiveness. This paradigm is anchored in theories of human capital, innovation diffusion, and motivational psychology, with the study seeking to enhance the understanding of teacher effectiveness in the context of educational digitalization.

2. Methodology

2.1 Research Approach and Design

This research utilized a quantitative explanatory methodology to investigate the structural relationships between digital competence, instructional innovation, work motivation, and teacher performance(Pandey et al., 2023). An explanatory method was chosen for determining both direct and indirect causal effects among the examined variables via hypothesis testing. Data were gathered by a survey method, suitable for systematically collecting the perceptions and behavioral tendencies of a large respondent cohort.

2.2 Research Setting and Period

The study was performed at junior secondary schools (SMP) situated in Kualasimpang, Aceh Tamiang Regency, Indonesia. This site was selected because of its comparatively substantial teacher population and the existence of varied institutional attributes. Data collection occurred from July to October 2025, allowing adequate time for instrument administration and response verification.

2.3 Population and Samples

The population consisted of all SMP teachers in Kualasimpang, amounting to 134 educators across four institutions. The sample size was calculated using the Slovin formula with a 5% margin of error, yielding a final sample of 100 educators. Proportional sampling was utilized to guarantee sufficient

participation from each school in accordance with its population size. This sample approach was implemented to improve the generalizability of the results to the target population.

2.4 Research Variable

The study examined four principal variables, each signifying a unique yet interrelated aspect of the research framework: Digital Competence (X1), Instructional Innovation (X2), Work Motivation (X3), and Teacher Performance (Y). Digital Competence (X1) and Instructional Innovation (X2) were designated as exogenous variables, functioning as autonomous constructs that impact other factors within the model. Digital Competence denotes educators' adeptness in employing digital tools, technologies, and platforms to facilitate and augment the learning experience. Instructional Innovation denotes educators' capacity to use inventive and flexible teaching methodologies, including contemporary pedagogical tactics and technological progressions into their instructional practices. Work Motivation (X3) was seen as both an endogenous and mediating variable, serving as the internal psychological aspect that responds to external factors such as digital competence and instructional innovation, while also conveying their impacts on teacher performance. It reflects the extent of excitement, dedication, and motivation that educators exhibit towards their professional responsibilities. Ultimately, Teacher Performance (Y) functioned as the primary endogenous variable, embodying the aggregate effects of the preceding variables. It signifies the quantifiable results of pedagogical efficacy, encompassing instructional quality, classroom management, and overall impact on student learning outcomes. The study's variable architecture delineates a causative and mediational structure, whereby digital competence and instructional innovation serve as primary catalysts that augment work motivation, subsequently bolstering instructor performance. This arrangement highlights the dynamic interplay among technical proficiency, innovative teaching, motivational elements, and professional results within the educational framework.

2.5 Instrumentation and Data Collection

The data analysis in this study was performed using a systematic, multi-phase approach to guarantee thorough interpretation and statistical correctness. A descriptive statistical analysis was conducted to summarize the respondents' characteristics and the distribution patterns of all research variables. This phase encompassed the calculation of essential statistical metrics, including the mean, standard deviation, minimum, and maximum values. These metrics summarized the main trends and diversity within the data, providing initial insights into the central tendencies and dispersion of each variable—digital competence, instructional innovation, work motivation, and teacher performance.

Secondly, a set of classical assumption tests were conducted to ascertain the suitability of the regression model and to confirm its adherence to the Best Linear Unbiased Estimator (BLUE) assumptions. The assessments comprised:

- The normality test, to ascertain that the residuals were regularly distributed;
- The multicollinearity test identifies potential relationships among independent variables.
- The heteroscedasticity test assesses the presence of uneven variance in the residuals.

The autocorrelation test assesses the independence of residuals across observations.

Successfully completing these diagnostic assessments was crucial to ensure that the regression estimates were accurate, reliable, and unbiased. The study utilized path analysis through multiple linear regression employing the Ordinary Least Squares (OLS) approach. This analytical method facilitated the examination of both direct and indirect (mediated) correlations among the variables.

The study specifically analyzed the direct impact of digital competence and instructional innovation on teacher performance, as well as the indirect effects mediated by work motivation. The model's robustness and explanatory power were further assessed through t-tests (to evaluate individual path significance), F-tests (to determine the model's overall fit), and the coefficient of determination (R^2) (to quantify the variance in teacher performance accounted for by the model). This comprehensive analytical process ensured that the findings were statistically robust, theoretically substantiated, and yielded significant interpretations of the causal links among the study variables.

2.6 Data Analysis

The data analysis was performed in multiple phases. Initially, descriptive statistical analysis was conducted to encapsulate the features of respondents and assess the distribution trends of each variable, encompassing mean, standard deviation, minimum, and maximum values.

Secondly, traditional assumption tests were conducted to verify the appropriateness of the regression model, encompassing assessments for normality, multicollinearity, heteroscedasticity, and autocorrelation. The experiments were performed to meet the Best Linear Unbiased Estimator (BLUE) criterion.

Third, route analysis utilizing multiple linear regression (Ordinary Least Squares) was conducted to examine both partial and simultaneous effects among variables. This method facilitated the analysis of the direct impacts of digital competence and instructional innovation on teacher performance, together with their indirect effects mediated by work motivation. The model's fit and explanatory power were evaluated by t-tests, F-tests, and the coefficient of determination (R^2) to determine the variance accounted for by the proposed model.

3. Results

3.1 The Effect of Digital Competence on Work Motivation (Hypothesis 1 Accepted).

The findings of the initial hypothesis test indicated that Digital Competence exerts a positive and statistically significant influence on Teachers' Work Motivation. This empirical observation suggests that an enhancement in teachers' proficiency with digital technology correlates with an increase in their motivation to fulfill professional responsibilities. The relationship highlights the crucial importance of digital competence in influencing teachers' psychological preparedness and involvement in contemporary educational settings. This result corresponds with the theoretical framework established by (Colquitt et al., 2015), especially regarding Self-Efficacy Theory, which defines self-efficacy as a fundamental factor influencing individual motivation. Educators with elevated digital competence often view themselves as proficient and efficient in managing instructional and administrative responsibilities that need technological tools. Such impressions augment their sense of agency and achievement, resulting in heightened intrinsic drive and a more profound commitment to their professional duties.

Moreover, digital competence mitigates occupational stress and cognitive load, since digitally adept educators are less prone to dissatisfaction or anxiety when incorporating digital technologies into their instructional methods. This fosters a constructive work ethic, perseverance, and a commitment to ongoing learning—essential components of enduring motivation. In contrast, educators with insufficient digital competencies frequently face obstacles that provoke feelings of inadequacy, reliance, and performance-related anxiety, thus undermining motivation and overall job satisfaction. The findings confirm that digital competence serves as both a technical skill and a psychological facilitator that bolsters self-confidence, efficiency, and intrinsic motivation, thereby improving teachers' motivation to perform effectively in a progressively digital educational environment.

3.2 The Effect of Learning Innovation on Work Motivation (Hypothesis 2 Accepted).

The study's findings indicate that Instructional Innovation positively and significantly impacts Work Motivation, with a path coefficient above that of Digital Competence. This suggests that adopting new teaching approaches significantly enhances teachers' motivation levels. The findings indicate that innovation serves as both a pedagogical endeavour and a psychological impetus, enhancing excitement, engagement, and dedication to teaching.

This result is closely aligned with the tenets of the Job Characteristics Theory(Hackman & Oldham, 1976), which asserts that specific job attributes—such as skill variety, task identity, and task significance—directly influence intrinsic motivation. When educators develop innovative learning resources, implement unconventional instructional techniques, or explore technology-enhanced approaches, their professional responsibilities become more dynamic and intellectually engaging. The augmentation of skill variety and work enrichment alleviates boredom, resulting in an enhanced sense of personal fulfilment and job satisfaction.

The process of innovation converts teaching from just an obligation into a significant and self-expressive pursuit. Educators enjoy enhanced psychological empowerment when they recognize that their creative contributions significantly impact student learning results. This feeling of achievement and professional independence amplifies intrinsic motivation, creating a beneficial cycle between innovation and ongoing involvement. Consequently, the results confirm that instructional innovation functions as both a professional and motivating catalyst. By promoting creativity, diversity, and self-efficacy in daily instructional practices, innovation enhances teachers' emotional engagement with their profession, thereby bolstering overall motivation and performance in educational environments.

3.3 *The Effect of Digital Competence on Teacher Performance (Hypothesis 3 Rejected).*

The testing of the third hypothesis indicated that there is no significant direct effect between Digital Competence and Teacher Performance (Sig. = 0.152 > 0.05). This discovery is especially significant since it challenges the prevailing notion that increased digital competency immediately correlates with enhanced educational efficacy. Nonetheless, when analysed within the theoretical frameworks supporting this study, the outcome is both rational and scientifically substantiated.

The Grand Theory defines performance as "the value of the array of employee behaviours that contribute, either positively or negatively, to the achievement of organizational goals." In this sense, Digital Competence denotes an individual's preparedness and capacity to employ digital tools, whereas Performance signifies the actual demonstration of such skill in professional settings. Thus, skill alone, absent the activation of behavioural or motivational drives, may persist as latent potential rather than manifesting as a realized outcome.

The negligible direct correlation underscores that having digital abilities does not inherently result in teachers exhibiting good digital-based instructional practices. Competence must be stimulated by motivational or environmental elements to manifest in observable performance outcomes. This concept corresponds with Spencer and Spencer’s Iceberg Model of Competence, which distinguishes between superficial features (knowledge and abilities) and deeper, intrinsic attributes (motives, traits, and self-image). Digital skills, situated at the superficial level, denote observable competencies. To convert these talents into exemplary teaching performance, underlying factors such as motivation, ambition, and dedication must serve as the primary catalysts.

This outcome substantiates the theoretical assertion that digital competence is a requisite yet inadequate prerequisite for performance improvement. In the absence of intrinsic motivation or favourable environmental conditions, even educators with substantial digital expertise may fail to convert their skills into effective teaching practices. This discovery highlights the essential mediating

function of Work Motivation, as validated in later hypotheses, in connecting potential (competence) with actual performance.

This data reveals that, among junior high school teachers in Aceh Tamiang, despite possessing a commendable understanding of technology, this knowledge has not been effectively translated into daily professional conduct, potentially due to limitations in facilities or an emphasis on competencies more relevant to digital administration than to pedagogical practices. Consequently, digital competency will affect performance solely if it is facilitated by robust motivation, as demonstrated by Hypothesis 1: Competency impacts Motivation.

3.4 The Effect of Learning Innovation on Teacher Performance (Hypothesis 4 Accepted)

This study's results offer robust empirical evidence that Learning Innovation positively and significantly impacts Teacher Performance, thereby strengthening the theoretical framework established by (Colquitt et al., 2015) concerning the multidimensional aspects of job performance, especially the subdimensions of Adaptive Task Performance and Creative Task Performance. These qualities highlight an individual's capacity to adapt behavior in response to fluctuating external situations and to provide innovative and effective concepts within their professional field. In the educational setting, learning innovation represents educators' endeavors to incorporate novel pedagogical methods, digital technology, and interactive learning instruments into classroom practices. These activities exemplify adaptive and creative competencies that directly boost performance outcomes.

Chapter II delineates that Adaptive Task Performance signifies a teacher's ability to manage technological advancements, curricular changes, and evolving learner requirements—competencies that are essential in 21st-century education. Empirical research confirms that educators who participate in instructional innovation demonstrate elevated levels of work engagement, instructional quality, and professional development. Through the implementation of innovative pedagogical approaches—such as inquiry-based learning, gamified instruction, or blended learning—educators exhibit adaptability while fostering the creative problem-solving abilities crucial for enduring professional efficacy. This research indicates that teachers in Aceh Tamiang who overcome conventional teaching methods and actively create creative learning experiences are successfully meeting the behavioral standards outlined in Organizational Behavior Theory. Their readiness to adopt innovation corresponds with performance metrics highlighting responsiveness, flexibility, and inventiveness in dynamic work environments. As a result, these educators are regarded as demonstrating exceptional task performance due to their alignment with the Adaptive and Creative Task Performance constructs, highlighting the correlation between innovation-oriented behavior and quantifiable professional excellence.

3.5 The Impact of Work Motivation on Teacher Performance (Hypothesis 5 Confirmed)

The findings of the path analysis demonstrate that Work Motivation has the most substantial and statistically significant impact on Teacher Performance, with a standardized coefficient of 0.344. This empirical finding corroborates the validity of the Integrative Model of Organizational Behavior proposed by(Colquitt et al.,2015.), which conceptualizes motivation as a core individual mechanism exerting a direct causal influence on job performance. In this paradigm, motivation denotes the psychological impetus that directs, energizes, and sustains individual efforts in the pursuit of work-related objectives. Aligned with expectancy theory (Vroom, 1964) and self-determination theory (Ryan & Deci, 2000), motivation functions as the primary mediating mechanism that converts individual capabilities and contextual resources into measurable performance results.

Within the educational setting, this relationship emphasizes that, despite substantial digital proficiency and innovative learning approaches, improvements in performance ultimately depend on the degree of intrinsic and extrinsic motivation held by educators. Motivation functions as the driving force that converts potential into actual performance by encouraging deliberate action and ongoing commitment. Therefore, educators possessing advanced digital competence (H1) and innovative capacity (H2) are more inclined to attain heightened motivational states, which subsequently contribute to enhanced performance outcomes (H5). This causal chain underscores that motivation is not simply a supplementary variable, but the fundamental determinant within the behavioural system that compels instructors to utilize their knowledge, creativity, and adaptive skills effectively.

Empirical research confirms these results, demonstrating that teacher motivation substantially impacts instructional quality, professional dedication, and student learning achievements (Han & Yin, 2016; Skaalvik & Skaalvik, 2018). Furthermore, motivated educators are more likely to adopt new technologies, participate in reflective practices, and maintain innovative pedagogical approaches. In organizational behaviour theory, this corresponds with the overarching assertion that performance results from motivated actions, which are influenced by cognitive assessments of expectancy, instrumentality, and valence (Vroom, 1964; Colquitt et al., 2015). Therefore, the primary function of motivation in this study's model reinforces its status as the psychological key linking individual resources to elevated performance within complex educational settings.

3.6 The Simultaneous Effect of Digital Competence, Innovation, and Motivation on Teacher Performance (Hypothesis 6 Accepted)

The results of the simultaneous test (F-test) demonstrate that Digital Competence, Learning Innovation, and Work Motivation collectively exert a significant and substantial influence on Teacher Performance, contributing a combined explanatory power of 53.3%. This finding underscores the multidimensional nature of teacher performance, affirming that it cannot be adequately explained by a single determinant but rather emerges from the synergistic interaction of cognitive, behavioral, and motivational factors. In this integrative framework, Digital Competence serves as the instrumental foundation—providing teachers with the necessary technological tools and operational literacy to navigate modern pedagogical environments (Tondeur et al., 2016); (Instefjord & Munthe, 2017)). Learning Innovation, on the other hand, represents the methodological dimension through which teachers translate digital skills into creative instructional practices that enhance engagement and learning outcomes. Finally, Work Motivation functions as the psychological catalyst that energizes and sustains these practices, converting potential capability into observable performance behavior.

This triadic relationship illustrates that teacher performance is a systemic construct—each component interdependent and indispensable. If any element is deficient, performance optimization becomes unattainable. For example, teachers who possess high digital competence but low motivational drive may lack the persistence or enthusiasm required to apply innovative teaching strategies effectively. Similarly, motivated teachers without sufficient digital literacy or innovative methodology may find their performance constrained by limited pedagogical tools . The results therefore advocate for a holistic managerial approach by school leaders in Aceh Tamiang Regency, emphasizing balanced development across competence, innovation, and motivation. A principal's leadership should not only facilitate access to digital resources but also cultivate a supportive environment that nurtures teacher creativity and intrinsic motivation (Hallinger & Heck, 2010; Leithwood et al., 2020). By ensuring the coexistence of these three pillars, schools can build a sustainable performance culture capable of adapting to the continuous evolution of educational demands in the digital era.

5. Conclusions

This study's findings demonstrate that digital competence positively and significantly affects the work motivation of junior high school teachers in Aceh Tamiang Regency, highlighting that technological proficiency functions not only as a technical resource but also as a psychological catalyst that boosts self-efficacy and professional enthusiasm. Learning innovation exerts a positive and significant influence on work motivation, with a markedly greater effect than digital competence, indicating that the implementation of novel, meaningful pedagogical methods enhance intrinsic motivation by making teaching more demanding and purposeful. Digital competence does not have a significant direct impact on teacher performance, suggesting that technical skills remain underutilized without motivational activation. In contrast, both learning innovation and work motivation positively and significantly affect performance, with motivation being the most prominent predictor. Digital competence, learning innovation, and job motivation collectively explain 53.3% of the variance in teacher performance, underscoring their synergistic impact on enhancing instructional quality. The results underscore the imperative for integrated interventions in resource-limited settings such as Aceh Tamiang, where focused professional development in innovative pedagogies and motivation-enhancing strategies, coupled with ongoing digital upskilling, can convert latent competencies into consistent high performance and significantly advance educational improvement.

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