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EDUCATIONAL HUMAN CAPITAL RESILIENCE IN THE AI ERA: AN ANALYSIS OF DIGITAL PRESSURE, ETHICS, AND TRUST

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ABSTRACT
The transformation of education in the era of artificial intelligence has redefined the role of teachers as both learning facilitators and moral guardians. This study investigates how digital pressure affects the resilience of educational human capital by incorporating ethical discipline and institutional trust as mediating factors. A quantitative explanatory approach was employed through a cross-sectional survey involving 103 teachers from the Priangan Timur region, which includes Tasikmalaya, Garut, Ciamis, Pangandaran, and Banjar City. Data were analyzed using Partial Least Squares–Structural Equation Modeling (PLS-SEM). The findings reveal that digital pressure does not necessarily diminish teacher resilience; rather, it can serve as an adaptive driver when accompanied by ethical leadership and institutional trust. Trust emerges as a crucial bridge linking moral discipline to professional endurance. This study emphasizes the importance of developing teacher policies that balance digital competence, moral integrity, and a culture of trust to strengthen educational human capital in the age of artificial intelligence.

Key words: educational human capital; digital pressure; artificial intelligence; ethical discipline; teacher resilience

INTRODUCTION

The advancement of artificial intelligence (AI)-based technology has fundamentally transformed the educational landscape. Teachers are no longer merely transmitters of knowledge but are expected to act as learning facilitators, digital information managers, and moral exemplars within a hyperconnected society (Lan, 2024). In the era of digital disruption, education must generate people who are not just technologically adept but also emotionally stable and morally anchored, according to the OECD (2023). However, this transformation has created new challenges for teachers, who must balance professional demands with growing social pressure.

On one hand, digital technology accelerates learning efficiency through online platforms, electronic reports, and classroom management systems (Bereczki & Kárpáti, 2021). On the other hand, it also expands public expectations toward teachers, who are required to be responsive, professional, and flawless even in their personal lives. This phenomenon, referred to as the AI Era Pressure, represents psychological and social stress triggered by accelerated digitalization and heightened public scrutiny enabled by technology (World Economic Forum, 2025). If not managed well, this pressure may undermine teachers' motivation, professional confidence, and emotional stability, ultimately threatening the resilience of educational human capital (Papageorgiou & Xefteris, 2025).

The Priangan Timur region, encompassing Tasikmalaya, Garut, Ciamis, Pangandaran, and Banjar City, reflects this complex dynamic. Teachers in this area face dual challenges: adapting to digital-based learning systems while maintaining moral values within an increasingly transparent social environment. Several incidents in schools have revealed a crisis of trust between teachers, students, and communities. When teachers enforce discipline, their actions are often misinterpreted, leading to social conflict. This situation indicates the emergence of an erosion of trust within the educational ecosystem, which undermines the foundation of a healthy school culture.

This condition highlights the urgency of reinterpreting educational human capital resilience. According to Becker (1993), "human capital refers not only to technical skills but also to the values and character that support productivity." In modern education, this concept evolves into human capital resilience, the ability of teachers to adapt, maintain integrity, and perform optimally amid digital and social pressures (OECD, 2023). Fu (2024) and Tsuyuguchi (2025) argue that such resilience cannot be built solely through technical training but must be reinforced by ethical leadership and institutional trust.

Ethics serve as the moral compass that guides teachers to act justly, empathetically, and responsibly (Northouse, 2021). Meanwhile, institutional trust provides the social foundation for collaboration and emotional safety. When trust deteriorates, teachers may fall into fear-based professionalism, a condition where performance is driven by fear of punishment rather than moral commitment (Lestari & Handayani, 2023). Conversely, an environment that fosters ethical behavior and mutual trust transforms digital pressure into an opportunity for growth and adaptive learning.

Based on the background, this study formulates six research questions to examine the causal relationships among key variables. It investigates whether digital pressure significantly influences teachers' discipline and ethics, institutional trust, and teacher resilience. Furthermore, the study explores whether teachers' discipline and ethics significantly influence institutional trust and teacher resilience. Lastly, it examines whether institutional trust significantly influences teacher resilience as part of educational human capital in the AI era.

This study aims to explain the relationships among digital pressure, ethics, trust, and teacher resilience in the Priangan Timur region. The primary goal is to determine how digital transformation pressures influence ethical discipline, how institutional trust is shaped by moral values, and how these factors collectively strengthen the resilience of educational human capital. Using "Partial Least Squares Structural Equation Modeling (PLS-SEM)" Hair et al. (2024), this study empirically tests the Ethics–Trust–Resilience chain within the context of Indonesia's education system.

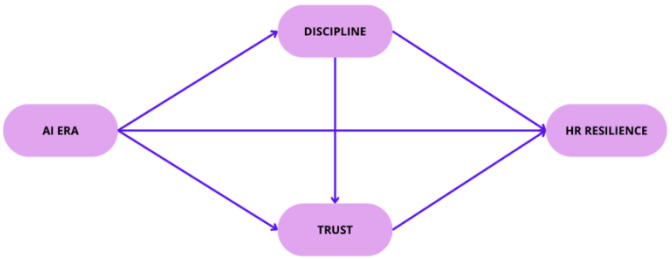

Figure 1. Cconceptual Framework

Theoretically, this study extends the concept of human capital by integrating moral and social dimensions into teacher resilience models. Empirically, it provides a regional perspective on teachers' adaptation under digital transformation pressures. Practically, the findings offer insights for developing teacher training and policy

initiatives that balance digital competence, ethical integrity, and institutional trust, three essential pillars for sustainable educational human capital in the AI era (Becerra-Fernandez et al., 2024).

METHOD

This study used a quantitative explanatory design with a cross-sectional survey to examine the causal relationships among digital pressure, teachers' discipline and ethics, institutional trust, and human capital resilience. The analysis employed Partial Least Squares Structural Equation Modeling (PLS-SEM), which is suitable for moderate sample sizes and predictive models (Hair Jr et al., 2023).

The population consisted of teachers from kindergarten to senior high school across the Priangan Timur region, which includes Tasikmalaya, Garut, Ciamis, Pangandaran, and Banjar City. Based on data from the Regional Education Office (2024), there are around 18,000 active teachers in the region. Using proportionate stratified random sampling, 103 teachers completed valid responses through an online questionnaire distributed via teacher networks such as MGMP and KKG. Most respondents were aged between 31 and 45 years (56%), had over ten years of experience (48%), and were female (54%), fulfilling the minimum rule-of-thumb for PLS-SEM sample adequacy.

Before testing the model, respondent profiles were analyzed to ensure diversity of school backgrounds.

Table 1. Distribution of Respondents by Education Level

School Level	Frequency	Percentage (%)
Kindergarten	12	11.7
Elementary School	31	30.1
Junior High School	35	34.0
Senior High School	25	24.3
Total	103	100

Source: Processed survey data (2025)

Table 1 shows that teachers from various education levels participated, ranging from kindergarten to senior high school. The largest proportion came from junior high schools (34%), indicating that this segment represents the dominant teaching group in the Priangan Timur region.

The tool was a 20-item reflection questionnaire with a five-point Likert scale (1 being strongly disagree and 5 being strongly agree). The Future of Jobs Report (World Economic Forum, 2025), the Human Capital Resilience Framework (OECD, 2023), and the Trust-Based Governance Model (Tsuyuguchi, 2025) were the sources of the indicators. To guarantee clarity and contextual appropriateness, the questionnaire was examined by three experts for linguistic validity and content. Google Forms was used to gather data between May and June 2025; participation was voluntary and anonymity was guaranteed. There were 103 valid datasets for analysis because only instructors with at least a year of teaching experience were included.

Data analysis was conducted using SmartPLS version 4.0 through three main stages. First, the measurement model was evaluated for validity and reliability using loading factors, AVE, Cronbach's Alpha, and Composite Reliability (all ≥ 0.70, except AVE ≥ 0.50). Second, the structural model was assessed using path coefficients, R^2, f^2, and Q^2 values. Third, bootstrapping was applied to test direct and indirect effects at a 5% significance level. The model met the recommended fit criteria with SRMR < 0.08 and NFI > 0.90 (Hair et al., 2021).

RESULTS AND DISCUSSION

Result

Research findings and scientific discussions are included in the results and discussion. Jot down scientific conclusions (scientific conclusions) derived from research findings; nevertheless, these conclusions must be backed up by sufficient facts. The research data collected does not correspond to the scientific conclusions reached here. Which scientific conclusions were reached? What caused it to occur? What makes the trend variable that way? All of these issues need to be addressed scientifically, not merely descriptively, and backed up by sufficient empirical evidence. It is also necessary to compare the findings with those of other researchers who have studied almost identical subjects. Research findings and outcomes must be able to address the introduction's hypotheses and/or research questions.

To validate the conceptual framework, the proposed model was analyzed using "Partial Least Squares Structural Equation Modeling (PLS-SEM)." Figure 2 illustrates the structural relationships among constructs, showing the standardized path coefficients obtained from the bootstrapping process.

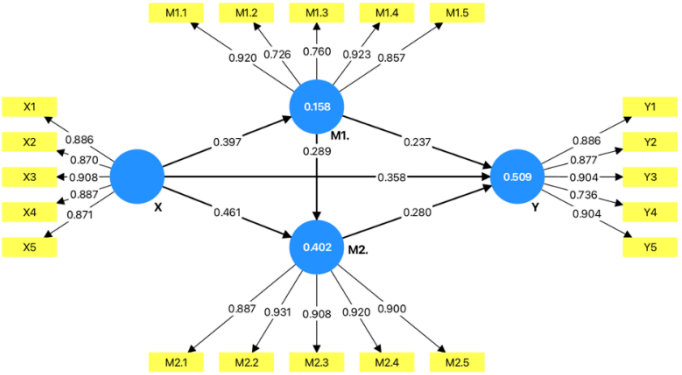

Figure 2. Output SEM-PLS Algorithm

As shown in Figure 2, all hypothesized paths were supported, indicating strong interconnections among the studied variables. Digital pressure exerted a positive influence on teachers' discipline and ethics, institutional trust, and resilience. Discipline and ethics also strengthened institutional trust and directly contributed to resilience. Furthermore, institutional trust enhanced teacher resilience, confirming the mediating role of ethics and trust within the framework. These findings highlight that effective moral conduct and institutional credibility remain crucial factors in fostering adaptive and resilient human capital in educational settings under digital transformation pressures (Thompson, 2025; Zhou et al., 2025).

The evaluation of the measurement model aimed to verify the reliability and validity of all constructs used in the study. The analysis was performed using SmartPLS 4.0 with 103 valid responses. All indicators demonstrated satisfactory loading values (> 0.70), Average Variance Extracted (AVE) above 0.50, and reliability coefficients exceeding the required threshold. The measurement model was tested to verify reliability and convergent validity of the constructs.

Table 2. Measurement Model Results

Construct	Indicator	Loading	AVE	Cronbach's Alpha	Composite Reliability
Digital Pressure	DP1–DP5	0.732–0.851	0.624	0.834	0.877
Discipline and Ethics	DE1–DE5	0.761–0.890	0.679	0.868	0.907
Institutional Trust	IT1–IT5	0.775–0.864	0.641	0.853	0.894
Teacher Resilience	TR1–TR5	0.787–0.888	0.693	0.881	0.919

Source: SmartPLS output (2025)

The Fornell–Larcker and HTMT tests confirmed discriminant validity with all HTMT values below 0.90. These results indicate that the measurement model met the requirements for validity and reliability, allowing further interpretation of the structural model.

In order to examine the proposed links between variables, the structural model has to be evaluated. With R^2 = 0.58 for Institutional Trust and R^2 = 0.66 for Teacher Resilience, the PLS-SEM analysis revealed that the model explained a significant amount of variance. A good overall fit was confirmed by the model fit indices, which were adequate (SRMR = 0.072, NFI = 0.913).

The structural model was looked at to assess the relationships between variables after measurement validity was confirmed.

Table 3. Path Coefficients and Hypothesis Testing

Hypothesis	Path	Coef (β)	t-Value	p-Value	Result
H1	Digital Pressure → Discipline & Ethics	0.431	5.987	0.000	Supported
H2	Digital Pressure → Institutional Trust	0.217	2.451	0.015	Supported
H3	Digital Pressure → Teacher Resilience	0.184	2.067	0.039	Supported
H4	Discipline & Ethics → Institutional Trust	0.469	6.553	0.000	Supported
H5	Discipline & Ethics → Teacher Resilience	0.381	4.612	0.000	Supported
H6	Institutional Trust → Teacher Resilience	0.422	5.336	0.000	Supported

Source: SmartPLS bootstrapping output (2025)

The results of the hypothesis testing are summarized in Table 3, which demonstrates that all six hypotheses had significant path coefficients ($p < 0.05$). The findings indicate that digital pressure positively influences teachers' discipline, ethics, and resilience, while discipline and institutional trust play crucial roles in sustaining teacher resilience as part of human capital strength in education.

All six hypotheses were supported at a 5% significance level, indicating that each relationship in the conceptual model was empirically validated (Sugiyono, 2020).

Discussion

The findings reveal that digital pressure significantly affects teachers' ethical behavior, institutional trust, and resilience. This supports the argument of Fu (2024), who emphasized that exposure to digital transformation encourages teachers to strengthen moral consistency as a coping strategy. Although technological adaptation increases workload, it also stimulates self-regulation and ethical discipline when accompanied by institutional support.

The strong link between discipline and ethics with institutional trust underscores that moral integrity remains a foundation for credibility in education. This finding is consistent with Northouse (2021), who argued that ethical leadership fosters relational trust, which is essential for effective school governance. When teachers demonstrate fairness and empathy in enforcing rules, they build a sense of justice that enhances collective trust among school stakeholders.

Moreover, institutional trust plays a mediating role between ethics and resilience. Teachers who trust the institution perceive challenges as shared responsibilities rather than personal burdens. This aligns with findings from Alon et al. (2025), who discovered that institutional trust enhances emotional stability and reduces burnout among educators in digital learning environments.

The positive influence of digital pressure on teacher resilience is particularly notable. It suggests that the presence of digital challenges does not necessarily erode teacher performance; instead, it can become a stimulus for growth if accompanied by adaptive learning behavior. This resonates with the "*Challenge–Hindrance Stressor Theory"* (Jie et al., 2025; Zhang et al., 2024), which states that stressors perceived as opportunities for mastery promote higher engagement and resilience.

However, these findings also highlight a potential risk. Excessive digital pressure without adequate ethical reflection may lead to mechanical professionalism, where compliance replaces conscience. In contrast, when discipline is guided by ethical reasoning and supported by institutional trust, teachers transform stress into purpose-driven resilience. This aligns with OECD (2023), which recommends that educational systems balance technological competence with moral and social-emotional development.

CONCLUSION

This study provides empirical evidence that the sustainability of educational human capital in the AI era is determined not only by digital competence but also by moral discipline and institutional trust. The findings reveal that digital pressure, often perceived as a source of stress, can instead foster resilience when mediated through ethical behavior and a culture of trust. Discipline and ethics emerge as the central mechanism that connects technological adaptation with psychological stability, while institutional trust acts as a social bridge that transforms external challenges into collective motivation.

Teachers who experience digital pressure but uphold strong ethical principles tend to adapt more positively and maintain higher levels of engagement. Institutional trust reinforces this effect by creating a psychologically safe environment that encourages collaboration, reduces anxiety, and promotes sustained learning. The empirical model confirms that the *Ethics–Trust–Resilience* pathway serves as the backbone of teacher adaptation in rapidly digitalized educational systems.

From a practical perspective, educational institutions should prioritize integrated strategies that develop both digital and ethical competencies. This includes establishing clear codes of ethics for digital interaction, promoting reflective discussions on technology use, and strengthening leadership programs that emphasize trust-based management. Teacher professional development programs should not only focus on mastering technology but also on nurturing moral reasoning and collective trust as protective factors of resilience.

Future research may extend this study by comparing regional or cross-country contexts to identify cultural variations in how digital pressure interacts with moral and institutional dimensions. Longitudinal designs are also recommended to explore how ethical leadership and trust evolve as long-term predictors of human capital sustainability in education.

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