What Makes Teachers Stay: A Study on the Influence Mechanism of the Attractiveness of the Teaching Profession in the Dual Context of Digital Intelligence and Student Cultivation Reform

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Abstract

The declining attractiveness of the teaching profession amid the digital intelligence transformation has become a global challenge. Drawing on the job demands-resources (JD-R) model, this study surveyed 327 primary and secondary school teachers in Zhejiang Province, employing a mixed-methods design (questionnaire survey and semi-structured interviews) to examine the influence mechanism of digital intelligence factors on occupational attractiveness. The results indicated that salary satisfaction represented the weakest dimension. Technology anxiety undermined occupational attractiveness by intensifying perceived work intensity, whereas perceived technological empowerment enhanced it by elevating perceived occupational prestige. Early-career teachers exhibited higher technology anxiety, and urban teachers experienced greater technology stress than their township counterparts. This study provides theoretical and practical implications for understanding teacher attractiveness in the digital intelligence era.

Keywords

Attractiveness of the teaching profession, Digital intelligence era, Influencing factors, Job demands-resources model, Mixed-methods research

Introduction

The declining attractiveness of the teaching profession has emerged as an urgent global concern. According to the Organisation for Economic Co-operation and Development (OECD) estimates, approximately one-quarter of member countries face severe teacher shortages, with turnover rates among early-career teachers reaching as high as 30%. China faces a similar dilemma: Despite successive policy initiatives aimed at raise teachers' socioeconomic status and remuneration, the teaching workforce continues to suffer from structural staffing shortages and a persistent lack of high-caliber applicants [1].

The ongoing digital-intelligent transformation is fundamentally reshaping teachers' professional environments and role expectations. On the positive side, emerging technologies, especially artificial intelligence and learning analytics, provide unprecedented opportunities to reduce routine administrative workloads and enhance instructional capacity. On the contrary, rising technostress and digital exhaustion are imposing new psychological burdens that impair teachers' professional well-being [2]. Compounding these technological shifts, the broader reform of educational pedagogy now demands that teachers exhibit high-order creative instructional competencies - a professional capability that increasingly determines both teacher effectiveness and public perceptions of teaching as a career.

Notably, the existing literature has largely focused on conventional determinants of teacher career attractiveness, while neglecting the interactive relationship between digital-intelligent factors and evolving pedagogical demands. To fill this research gap, the present study proposes a dual-path "stress-empowerment" framework. This model seeks to systematically unpack the mechanisms through which

digital-intelligent transformation influences teacher career attractiveness, with the ultimate goal of providing empirically grounded suggestions for educational policy and institutional practice.

Literature review

Traditional perspectives on teacher career attractiveness

Teacher career attractiveness has long occupied a central position in educational human resource research. The concept encompasses two interrelated dimensions: the capacity of the teaching profession to draw prospective entrants from the labour market, and its ability to sustain the professional commitment of in-service teachers [3].

Early scholarship exploring the link between teacher compensation and educator recruitment was largely built on economic labor market theories, centering on the intrinsic correlation between salary levels and the profession's appeal to prospective teachers. Based on nationwide stratified sampling survey data covering 9,183 compulsory education teachers across eastern, central and western China, there is delivered robust empirical evidence verifying pay as the dominant determinant shaping high-quality educators' willingness to serve in specific school contexts. The quantitative analysis demonstrated that measurable improvements in teachers' pay packages directly lift the propensity of qualified personnel to take up teaching posts. Specifically, narrowing urban-rural salary gaps and raising rural teacher allowances can substantially mitigate the outflow of outstanding instructors and ease structural teacher shortages in rural schools [4]. This correlation gained additional empirical support from the cross-study meta-analysis conducted by Pham et al., who verified a stable positive linkage between teachers' relative compensation and the appeal of the teaching profession across varied educational contexts. Critically, their findings also revealed that this salary effect is substantially more pronounced in developing economies - a finding with important implications for policy prioritization [5].

Beyond monetary rewards, workload constitutes another major determinant of career attractiveness. Extensive evidence indicates that excessive working hours and proliferating administrative burdens are primary drivers of burnout and turnover intentions among teachers. In China, this problem is particularly prominent: Teachers often report that non-instructional tasks, including paperwork, inspection drills and performance evaluations, consume a disproportionate share of their working hours, thereby eroding job satisfaction and professional morale [6].

Occupational prestige refers to society's collective evaluation of a profession's social standing and further shapes individuals' career aspirations and professional identity. Although the prestige attached to teaching varies widely across cultural and national contexts, a sustained downward trend has been observed globally. Rooted in the global popularization of data-driven performance accountability systems, this decline in teaching's social status is closely linked to fading institutional and parental trust in teachers' professional judgment. Daliri-Ngametua et al. argued persuasively that such reputational erosion constitutes a fundamental social driver of teacher shortages, as rigid evidence-based supervision mechanisms systematically dissuade high-achieving graduates from viewing teaching as a viable career path [7]. Professional development opportunities represent a fourth pillar of career attractiveness. Teachers' perceptions of career advancement prospects and the clarity of promotion ladders are positively correlated with their professional commitment. Within China's educational system, the professional title evaluation mechanism serves as the core incentive structure for teachers' career progression. Nevertheless, its motivational effectiveness is considerably constrained by rigid assessment criteria and limited advancement opportunities, issues that have drawn increasing scholarly criticism.

In sum, traditional research has yielded a reasonably mature analytical framework anchored in four core determinants: compensation, workload, prestige, and professional growth. Nevertheless, it is important to recognize that the bulk of this scholarship was formulated within the socio-economic conditions of the pre-digital industrial era. Its applicability and explanatory adequacy in the context of accelerating digital-intelligent transformation therefore warrant careful re-examination - a task to which the following sections turn.

Digital-intelligent transformation and the teaching profession: Divergent research trajectories

As educational digitalization has gathered momentum,

scholarly interest in the implications of digital-intelligent technologies for teaching has grown correspondingly. Two largely separate research streams have emerged: one concentrating on technology-induced stress, the other on technological empowerment.

(1) Technostress stream

Tarafdar et al. furnished the foundational conceptual vocabulary for this line of inquiry, delineating technostress into five constituent dimensions: techno-overload, techno-invasion, techno-complexity, techno-insecurity and techno-uncertainty [8]. Subsequent educational research applying this framework has identified several profession-specific sources of technostress, including rapid technological iteration, insufficient teachers' digital literacy, and intensified data-based performance monitoring. Liu and Li's three-wave longitudinal study provided solid empirical evidence for these adverse outcomes: Persistent digital technology anxiety not only impairs classroom teaching quality but also weakens teachers' professional self-perception. From the perspective of cognitive appraisal, teachers with technology anxiety tend to perceive digital work demands as threats to their professional competence and feel a lack of supportive resources, which eventually leads most surveyed teachers to avoid digital teaching tools intentionally [9].

More recently, the construct of digital fatigue has attracted scholarly attention. Defined as psychosomatic exhaustion caused by long-term exposure to digital devices, digital fatigue has been empirically linked to aggravated job burnout - a correlation particularly salient in remote and hybrid teaching scenarios [10]. The coronavirus disease 2019 (COVID-19) pandemic greatly exacerbated this phenomenon, as the full-scale shift to online learning exposed teachers to unprecedented screen time and continuous connectivity requirements, making digital fatigue a non-negligible threat to teachers' mental health [11].

(2) The empowerment stream

Running parallel to the stress of literature, a second body of work has emphasized the enabling potential of digital technologies. The concept of perceived technological empowerment describes the degree to which teachers regard technology as a tool that supports and optimizes their teaching practice, which lies at the core of this research stream. Davis's Technology Acceptance Model identifies perceived usefulness as the core predictor of technology adoption. Subsequent studies build on this framework and extend its logic. These studies confirm that perceived technological empowerment boosts teaching efficiency. It also strengthens teachers' professional efficacy and overall job satisfaction [12].

A more recent and conceptual promising development within this stream concerns human-artificial intelligence (AI) collaboration. The emergence of generative artificial intelligence has created new opportunities for human-AI collaborative teaching, where repetitive routine tasks can be delegated to AI systems, freeing teachers to focus on high-value educational practices such as student tutoring, instructional facilitation and creative curriculum design [13]. While theoretically promising, existing research in this field remains largely speculative. Rigorous empirical studies exploring the real conditions, processes and outcomes of human-AI collaboration in authentic school environments are still scarce.

(3) Synthesizing the two streams

Despite the respective contributions of these two research streams, two major research gaps remain. First, studies on technological stress and technological empowerment have developed in relative isolation, with few attempts at theoretical integration. Second, most existing research takes technology acceptance or work efficiency as outcome variables, while the direct and indirect paths linking digital intelligence factors to the attractiveness of the teaching profession remain underexplored.

Creative teaching ability and professional development: An underexplored link

Creative teaching ability represents a core component of teachers' professional competence. This construct refers to teachers' capacity to adopt innovative pedagogical strategies and cultivate divergent thinking among students. As education systems worldwide take fostering innovative talent as a primary policy goal, the importance of this ability for teaching effectiveness and career outcomes has grown prominently.

The scholarly lineage of creative teaching research is well established. Craft et al. proposed the influential concept of "possibility thinking", arguing that creative pedagogy essentially consists of guiding students to consider multiple perspectives and alternative solutions [14]. Lucas et al. developed a five-factor creativity model

covering imagination, curiosity, persistence, collaboration and self-discipline, which has since become a usable evaluation framework for assessing teachers' creative teaching performance [15]. The inclusion of creative thinking as a core assessment domain in Programme for International Student Assessment (PISA) 2022 further recognized the educational value of this construct and stimulated a new wave of empirical research [16].

In terms of antecedent variables, research has identified differentiated influencing factors at both individual and contextual levels. At the individual level, teachers' creative personality traits, educational philosophies and accumulated teaching experience all significantly predict creative teaching behaviors [17]. At the contextual level, school culture, administrative leadership and the availability of professional development opportunities exert equally significant impacts. Notably, schools with an innovation-supportive atmosphere can greatly raise teachers' willingness to experiment with innovative teaching methods [18].

When exploring the linkage between creative teaching ability and career outcomes, limited existing evidence indicates a positive correlation mediated by professional identity. Teachers who perceive themselves as competent creative practitioners tend to exhibit stronger teaching self-efficacy and deeper identification with their professional roles [19]. However, a prominent research gap is that few studies have systematically examined whether and how this ability affects prospective teachers' career choices and in-service teachers' retention intentions through shaping perceived occupational prestige.

Equally importantly, the transformative expectations surrounding creative pedagogy are not unambiguously beneficial. They may also generate a distinct form of occupational strain. When teachers experience a significant gap between the creativity demands of educational reform and their perceived capacity to meet those demands, professional anxiety is likely to ensue, an affective response that could paradoxically undermine the very career attractiveness that creative teaching reforms ostensibly seek to enhance. This dual-edged nature of creative teaching requirements has yet to receive systematic empirical attention, and the present study directly addresses this oversight.

Literature review and critique

In summary, existing research has laid a solid foundation for the study of the attractiveness of the teaching profession, yet the following gaps remain.

First, insufficient theoretical integration. Traditional research and research on digital intelligence remain largely disconnected, and there is a lack of systematic studies that incorporate both traditional factors and digital intelligence factors into a unified analytical framework. Whether digital intelligence factors act as independent influencing variables or exert their effects indirectly through traditional factors, and the underlying mechanisms involved, remain unclear.

Second, a lack of perspective shift. Research on the cultivation of creative thinking has predominantly focused on the perspective of student development, with little attention given to the impact of creative teaching ability from the perspective of teacher professional development. The role of student cultivation reform in reshaping the occupational prestige of teachers, and its subsequent influence on occupational attractiveness, has not yet received sufficient attention.

Third, insufficient depth in mechanism research. Existing studies have mostly focused on direct effects, with limited exploration of mediating mechanisms and moderating effects. The specific pathways through which digital intelligence affects occupational attractiveness, the relative strength of different pathways, and group differences in these effects remain questions that warrant further investigation.

In response to the aforementioned research gaps, this study adopts the job demands-resources (JD-R) model as the core analytical framework. Proposed by Demerouti and Bakker, the JD-R model classifies occupational characteristics into two categories: job demands and job resources. Job demands refer to aspects of the job that require sustained physical or psychological effort, such as workload and role stress. Job resources refer to aspects that facilitate goal achievement and stimulate personal growth, such as salary, social support, and development opportunities [20]. The model posits two core pathways: job demands lead to burnout through the depletion of individual resources, while job resources enhance work engagement by fostering motivation. A large body of research has confirmed that this model can effectively explain teacher burnout and retention intentions [21]. In

this study, technology anxiety and digital fatigue are defined as new job demands in the digital intelligence era, while perceived technological empowerment and human-machine collaboration experience are defined as new job resources.

Building on this foundation, the transactional theory of stress and self-efficacy theory are introduced as supplementary explanatory mechanisms. The transactional theory of stress posits that stress arises from dynamic interactions between individuals and their environment. It hinges on people's cognitive appraisal of threats and their evaluation of coping capacity. This theory explains why teachers exhibit different degrees of technology anxiety amid identical digital intelligence transformation [22]. Self-efficacy theory refers to an individual's belief in their ability to accomplish a specific task. In educational technology research, teachers' computer self-efficacy exerts a significant impact on their technology acceptance and usage willingness. This clarifies how perceived technology empowerment improves teachers' occupational evaluation by fostering their sense of efficacy [23].

Based on the integration of the above theories, a dual-pathway model of "stress-empowerment" is constructed. In the stress pathway, technology anxiety and digital fatigue, as new job demands, undermine the attractiveness of the teaching profession by heightening perceived work intensity. In the empowerment pathway, perceived technology empowerment and human-machine collaboration experience, as new job resources, enhance the attractiveness of the teaching profession by elevating perceived occupational prestige. Traditional factors serve as mediators in the model, meaning digital intelligence factors do not directly influence the attractiveness of the teaching profession, but rather exert their effects indirectly by reshaping teachers' perceptions of traditional factors.

Furthermore, this study embeds the new requirement for teachers' creative teaching ability arising from student cultivation reform into the dimension of occupational prestige. When society generally recognizes the necessity of creative teaching ability for teachers, the teaching profession gains stronger professional attributes and higher occupational prestige. However, teachers may develop competence anxiety when they feel incapable of meeting relevant standards. This design expands the contemporary connotation of occupational prestige and achieves an integration of perspectives between research on creative thinking cultivation and research on the attractiveness of the teaching profession.

Model design and hypotheses

Model concept

The model comprised three types of variables: The independent variables were the digital intelligence factors, which were divided into a stress pathway (technology anxiety, digital fatigue) and an empowerment pathway (perceived technology empowerment, human-machine collaboration experience). The mediating variables were the traditional factors (perceived work intensity, perceived occupational prestige) and the dependent variable was the attractiveness of the teaching profession. The model specified both direct and indirect paths from the digital intelligence factors to occupational attractiveness. In the indirect paths, digital intelligence factors influence occupational attractiveness by shaping teachers' perceptions of traditional factors, with the stress pathway transmitted through perceived work intensity and the empowerment pathway through perceived occupational prestige. Although the direct paths were included in the model, they were expected to be non-significant, meaning that the digital intelligence factors influenced occupational attractiveness primarily indirectly through the mediating role of the traditional factors. This specification helps to clarify the relationship between digital intelligence factors and traditional factors in the formation of occupational attractiveness.

Research hypotheses

Technology anxiety and digital fatigue represent new job demands that teachers face in the transformation of digital intelligence. According to the JD-R model, job demands require individuals to exert sustained physical and psychological effort, and their prolonged accumulation depletes limited psychological resources, ultimately leading to negative outcomes such as burnout. When teachers experience anxiety toward new technologies, this anxiety first manifests as heightened perceived work intensity, as teachers need to invest additional time in learning new tools, adapting to new platforms, and meeting data-driven evaluation requirements. These new tasks are superimposed on existing teaching responsibilities, directly increasing

workload. The rise in work intensity further drains teachers' physical and psychological resources, engendering a sense of energy depletion and ultimately reducing their identification with the teaching profession and their intention to stay. In addition, digital fatigue reflects teachers' sense of exhaustion and aversion resulting from prolonged digital device use and information overload. This sense of aversion weakens teachers' positive emotions toward the profession and may directly reduce occupational attractiveness without the mediation of perceived work intensity.

Accordingly, this study proposes the following hypotheses:

H_1: Technology anxiety has a positive effect on perceived work intensity.

H_2: Perceived work intensity has a negative effect on the attractiveness of the teaching profession.

H_3: Digital fatigue has a negative effect on the attractiveness of the teaching profession.

H_4: Perceived work intensity mediates the relationship between technology anxiety and the attractiveness of the teaching profession.

Perceived technology empowerment and human-machine collaboration experience represent new job resources that teachers acquire during the digital intelligence transformation. The JD-R model posits that job resources not only help individuals cope with the demands of their work but also stimulate work motivation by satisfying basic psychological needs, such as the needs for competence, autonomy, and relatedness, thereby generating positive work outcomes.

When teachers perceive that technology can effectively support their teaching, for instance by cutting repetitive administrative tasks via intelligent tools, analyzing student learning data to identify weak points, and enriching instructional materials with digital resources - they develop a strong sense of technological empowerment. This sense of technological empowerment enhances their teaching self-efficacy and professional confidence, leading to more positive evaluations of their professional competence and occupational value. At the same time, a positive experience of AI-human collaboration enables teachers to feel that technology is not replacing them but acting as a partner in accomplishing the shared mission of student cultivation. This experience of "human-machine complementarity" reinforces teachers' recognition of the unique value of their profession, such as emotional connection, creative guidance, and value leadership, and further elevates their perception of occupational prestige. As a subjective evaluation of the social status and public recognition of their profession, perceived occupational prestige, when enhanced, strengthens teachers' professional self-esteem and occupational identity, and accordingly increases their intention to stay and willingness to teach.

Accordingly, this study proposes the following hypotheses:

H_5: Perceived technology empowerment has a positive effect on perceived occupational prestige.

H_6: Human-machine collaboration experience has a positive effect on perceived occupational prestige.

H_7: Perceived occupational prestige has a positive effect on the attractiveness of the teaching profession.

H_8: Perceived occupational prestige mediates the relationship between perceived technology empowerment and the attractiveness of the teaching profession.

H_9: Perceived occupational prestige mediates the relationship between human-machine collaboration experience and the attractiveness of the teaching profession.

The JD-R model allows job demands and job resources to affect outcome variables either directly or through mediating pathways. However, this study contends that the influence of digital intelligence factors on occupational attractiveness is primarily transmitted through the mediating pathways of traditional factors, and the direct effects are likely to be non-significant.

In the stress pathway, technology anxiety is inherently an emotional reaction and does not directly prompt teachers to leave the profession. Rather, it makes teachers feel that "there is more to do" and "the demands are higher", and it is perceived work intensity that serves as the direct trigger of burnout. A township junior secondary school teacher mentioned in the interview, "Learning new platforms and new software is all additional workloads. I teach during the day and study them at night. What wears me out is not the technology itself, but the sheer volume of things to do." This indicates that what truly erodes teachers' professional enthusiasm is not technology anxiety per se, but the "sense of workload" intensified by

the anxiety. In other words, technology anxiety must be translated into a concrete perception of increased work intensity before it can substantially weaken occupational attractiveness.

In the empowerment pathway, perceived technology empowerment also struggles to directly alter teachers' career choice intentions. A teacher does not choose to remain in teaching simply because the technology is easy to use, but because perceived technology empowerment makes them feel "more professional" and "able to keep up with the times". Perceived occupational prestige is the key mediator driving professional identity and retention intentions. An urban junior secondary school teacher stated, "Being able to use AI to make courseware and use data to diagnose student learning makes me feel that I have genuinely progressed professionally, and I am more confident when communicating with colleagues." This suggests that perceived technology empowerment first acts on teachers' judgments of their own professional value, and then indirectly strengthens retention intentions through the elevation of occupational prestige.

Based on the analysis above, this study includes the direct paths from digital intelligence factors to occupational attractiveness in the model but expects them to be non-significant. The significance of this specification is that if the direct effects are indeed non-significant while the mediating effects are significant, it would demonstrate that the mechanism of digital intelligence factors is one of "indirect transmission" rather than "direct change". This helps to reveal the intrinsic mechanisms through which digital intelligence influences occupational attractiveness and to distinguish the role of digital intelligence factors themselves from the mediating role of traditional factors. Therefore, this study proposes:

H_{10}: Technology anxiety has a non-significant direct effect on the attractiveness of the teaching profession.

H_{11}: Perceived technology empowerment has a non-significant direct effect on the attractiveness of the teaching profession.

Research methods

Research design

This study adopted mixed-methods research design, combining quantitative and qualitative approaches with the quantitative component as the dominant strand. Quantitative research can reveal statistical relationships among variables based on large samples, answering "what" and "how much" questions; qualitative research can provide in-depth understanding of the reasons and mechanisms behind phenomena, answering "why" and "how" questions. The two methods have different emphases and complement each other.

The quantitative component used a questionnaire survey to collect data on the attractiveness of the teaching profession and its influencing factors. The questionnaire was designed based on the JD-R model, covering variables such as traditional factors, digital intelligence factors, and occupational attractiveness, with all items rated on a 5-point Likert scale. After data collection, structural equation modeling (SEM) was employed to examine the path relationships among the variables, including direct and mediating effects. The qualitative component used semi-structured interviews to explore teachers' subjective experiences and deeper concerns. The interview guide was organized around four themes: perceptions of occupational attractiveness, influences of traditional factors, experiences with digital intelligence technology application, and suggestions for improvement. Each interview lasted 30 to 45 minutes, was audio-recorded with consent, and transcribed verbatim for thematic analysis. After the quantitative analysis was completed, typical participants were purposefully selected for in-depth interviews to explain and supplement the quantitative findings. The integration of the two methods facilitated triangulation and enhanced the credibility of the research conclusions.

Participants and sampling

The participants of this study were primary and secondary school teachers in Zhejiang Province, covering three school stages: primary school, junior secondary school, and general senior secondary school. As a pioneering province in educational digitalization reform, Zhejiang provides teachers with relatively extensive exposure to and in-depth experience with digital intelligence technologies, making it a suitable research region.

The sampling was stratified along three dimensions. Geographically, two prefecture-level cities, Hangzhou and Jinhua, were selected. In terms of school type, schools were categorized into urban schools and township schools. Regarding school stage, both primary and junior secondary schools were included, while senior

secondary school teachers were supplemented through online channels. From each city, two urban schools and two township schools were selected, yielding a total of eight schools. From each school, 40 to 50 teachers were invited to participate in the questionnaire survey. A total of 408 questionnaires were distributed, and 327 valid questionnaires were returned, resulting in an effective response rate of 80.1% as shown in Table 1.

Table 1. Demographic characteristics of participants (n=327).

Variable	Category	n	%
Gender	Male	124	37.9
	Female	203	62.1
School stage	Primary school	153	46.8
	Junior secondary school	133	40.7
	Senior secondary school	41	12.5
School type	Urban	174	53.2
	Township	153	46.8
Teaching experience	<5 years	82	25.1
	6-15 years	142	43.4
	>15 years	103	31.5
Subject	Chinese	72	22.0
	Mathematics	66	20.2
	English	57	17.4
	Integrated science	51	15.6
	Integrated humanities	46	14.1
	Music, PE, art, and IT	35	10.7

Interview participants were selected from the teachers who completed the questionnaire through purposive sampling. The sampling procedure considered four dimensions: teaching experience, school stage, school type, and geographic location. This approach ensured that the interview sample captured diverse perspectives among different groups of teachers. A total of 22 participants were actually interviewed, including 16 frontline teachers and 6 school administrators (including vice principals in charge of teaching and academic affairs directors). The final number of interviewees was determined based on the principle of information saturation, meaning that sample expansion ceased when new interviews no longer provided substantively new information. The final interview sample of 22 participants closely matched the structural characteristics of the questionnaire sample in terms of the distribution of teaching experience, school stage, and school type, allowing qualitative findings to be effectively compared within the quantitative analytical framework. Each interview lasted between 30 and 45 minutes. After the interviews, the recordings were transcribed verbatim. Only participant codes were retained in the transcripts; names and specific school names were not recorded.

Research instruments

The questionnaire was designed based on the JD-R theory and a review of the literature. It consisted of four sections, with all items rated on a 5-point Likert scale (1=strongly disagree, 5=strongly agree). The first section covered demographic information, collecting demographic variables such as gender, teaching experience, school stage, school type, and subject taught. The second section was the traditional factors scale, comprising four dimensions: salary satisfaction, perceived work intensity, perceived occupational prestige, and perceived career development space. The third section was the digital intelligence factors scale, comprising four dimensions: technology anxiety, digital fatigue, perceived technology empowerment, and human-machine collaboration experience. Among these, the occupational prestige dimension included two items regarding the perceived new requirements of student cultivation, measuring the extent to which teachers perceived society's expectation that they cultivate students' creative thinking. The fourth section was the occupational attractiveness scale, measuring teachers'

willingness to teach and intention to stay. After the initial draft was developed, two researchers in the field of education and three frontline teachers were invited to review the content, dimensional structure, and clarity of expression. Based on their feedback, the wording of some items was revised, resulting in a pilot test version.

A pilot test was conducted with 50 teachers, yielding 44 valid responses. In terms of reliability, the Cronbach's α values for all dimensions were above 0.700, indicating good internal consistency of the scales. Regarding validity, the Kaiser-Meyer-Olkin (KMO) value was 0.823, and Bartlett's test of sphericity was significant ($p< 0.001$). The factor structure extracted through exploratory factor analysis was consistent with the theoretical construct, and all item loadings were above 0.500. After the formal survey, confirmatory factor analysis was conducted to examine construct validity. The comparative fit index (CFI) and Tucker-Lewis index (TLI) were both above 0.90, the root mean square error of approximation (RMSEA) was below 0.080, the composite reliability (CR) values for all dimensions were above 0.700, and the average variance extracted (AVE) values were above 0.500, indicating satisfactory reliability and validity of the scales.

The interviews adopted a semi-structured format. The interview outline was developed around five themes: perceptions of occupational attractiveness, influences of traditional factors, experiences with digital intelligence technology application, new requirements of student cultivation reform, and suggestions for improvement. During the interviews, follow-up questions were flexibly adjusted according to the participants' responses without strict restrictions, in order to obtain richer qualitative information.

Data collection and analysis

The questionnaire was distributed through both online and offline channels. Offline, after obtaining the schools' consent, members of the research team visited the schools to distribute the questionnaires uniformly. Teachers completed the questionnaires collectively during teaching and research activity sessions or staff meetings, and the questionnaires were collected on the spot. This approach helped improve the response rate and the quality of the responses. Online, an electronic questionnaire link was generated via the SoJump platform and forwarded by school coordinators to the schools' teacher work groups. Teachers participated voluntarily and completed the questionnaire within a specified time frame. The online distribution served as a supplement to the offline channel, primarily targeting teachers who were unable to participate offline due to time or location constraints. Data collected from both channels were merged and screened together. Invalid questionnaires, such as those with excessively short completion times or obviously patterned responses, were eliminated.

The interviews were conducted in a semi-structured format, one-on-one by research team members. For urban schools, face-to-face interviews were primarily used; for township schools, the interview mode (face-to-face or online video) was determined based on transportation conditions and participants' preferences. Each interview lasted between 30 and 45 minutes. Before the interview began, the purpose of the research and confidentiality principles were explained to the participants, and their consent was obtained for audio recording. The entire interviews were audio-recorded and transcribed verbatim within one week after the interview. Only participant codes were retained in the transcripts; names and specific school names were not recorded to protect participants' privacy.

Quantitative data were analyzed using SPSS 26.0 for descriptive statistics and difference analysis. First, the demographic characteristics of the sample and the means and standard deviations of each variable were described. Then, independent samples *t*-tests and one-way analysis of variance (ANOVA) were used to compare differences in occupational attractiveness and its dimensions across different groups. SmartPLS 4.0 was used to construct a structural equation model and to test the path relationships and mediating effects among the variables. Model fit was evaluated using indices such as standardized root mean square residual (SRMR) and normed fit index (NFI). The significance of the mediating effects was tested using the bootstrap method (5,000 resamples), and 95% confidence intervals for the indirect effects were calculated. In addition, multigroup analysis was conducted to compare path coefficient differences among teachers with different teaching experience, school types, and school stages. Qualitative data were analyzed using NVivo 14 for coding and thematic analysis. First, open coding was performed on

the transcripts to extract key statements related to occupational attractiveness. The codes were then grouped into themes. Finally, cross-validation and supplementary explanation were carried out by integrating the qualitative findings with the quantitative analysis results.

Results

Research question 1: Current status of the attractiveness of the teaching profession

The overall mean of the attractiveness of the teaching profession was 3.21 (SD=0.92), slightly above the theoretical midpoint of 3. Among the dimensions, salary satisfaction scored the lowest (M=2.58, SD=1.03) and was the only dimension below the midpoint. Perceived work intensity scored the highest (M=3.82, SD=0.95), indicating that teachers generally perceived a heavy workload. Technology anxiety (M=3.55, SD=0.96) and digital fatigue (M=3.48, SD=0.93) both exceeded 3.40, suggesting that the stress brought by digital intelligence technologies had become quite common. Perceived occupational prestige was relatively high (M=3.65, SD=0.88) as shown in Table 2.

Table 2. Means and standard deviations of the variables.

Variable	M	SD	D per item
Attractiveness of the teaching profession	3.21	0.92	3.21
Salary satisfaction	2.58	1.03	2.58
Perceived work intensity	3.82	0.95	3.82
Perceived occupational prestige	3.65	0.88	3.65
Perceived career development space	3.17	0.99	3.17
Technology anxiety	3.55	0.96	3.55
Digital fatigue	3.48	0.93	3.48
Perceived technology empowerment	3.12	0.90	3.12
Human-machine collaboration experience	3.05	0.89	3.05

Significant differences were found among different teaching experience groups. Teachers with less than 5 years of experience scored significantly lower in perceived career development space than those with more than 15 years of experience, and their level of technology anxiety was significantly higher than that of the other two groups ($p<0.05$). Urban teachers' technology anxiety was significantly higher than that of township teachers ($t=-2.01$, $p<0.05$). No significant differences were observed in the overall attractiveness of the teaching profession by gender or school stage as shown in Table 3.

Table 3. Group differences in the attractiveness of the teaching profession.

Variable	Category	M	Test statistic	Significant differences
Gender	Male (n=120)	3.18	t=-0.87	/
	Female (n=200)	3.23	/	
Teaching experience	<5 years (n=80)	3.02	F=4.21*	Perceived career development space, technology anxiety
	6-15 years (n=100)	3.25	/	/
	>15 years (n=100)	3.33	/	/
School stage	Primary (n=150)	3.28	F=2.89	/
	Junior secondary (n=130)	3.15	/	
	Senior secondary (n=40)	3.12	/	
School type	Urban (n=170)	3.12	t=-2.01*	Technology anxiety
	Township (n=150)	3.31	/	/

Note: *p<0.05.

The statements of several interviewees corroborated the quantitative results. An urban primary school teacher with 22 years of teaching experience mentioned, “The urban school requires teachers to use various platforms, record lessons, and upload data. Every semester we also have to assess our information technology teaching ability. For those of us who are a bit older, it is quite overwhelming.” A township junior secondary school teacher with 10 years of teaching experience stated, “Compared to urban teachers, our salary is indeed hard to look at. Housing prices and living costs are the same, but our income is much lower.”

Research question 2: Structural equation model analysis

To examine the influence mechanism of digital intelligence factors on the attractiveness of the teaching profession, this study constructed a stress-empowerment dual-pathway structural equation model.

The model fit indices were as follows: $\chi^2/df=2.31$, CFI=0.94, TLI=0.92, RMSEA=0.05, SRMR=0.04. All indices met the recommended criteria, indicating a good model fit.

The results of the path analysis showed the following. In the stress pathway, technology anxiety had a significant positive effect on perceived work intensity ($\beta=0.34$, $p<0.001$), perceived work intensity had a significant negative effect on the attractiveness of the teaching profession ($\beta=-0.27$, $p<0.001$), and digital fatigue had a significant direct negative effect on the attractiveness of the teaching profession ($\beta=-0.19$, $p<0.01$). In the empowerment pathway, perceived technology empowerment ($\beta=0.29$, $p<0.001$) and human-machine collaboration experience ($\beta=0.21$, $p<0.001$) had significant positive effects on perceived occupational prestige, and perceived occupational prestige had a significant positive effect on the attractiveness of the teaching profession ($\beta=0.31$, $p<0.001$). The direct effects of technology anxiety and perceived technology empowerment on the attractiveness of the teaching profession were both non-significant, indicating that their influences were primarily transmitted through mediating pathways as shown in Table 4.

Table 4. Path coefficients and hypothesis testing results.

Path	β	t	p
Technology anxiety → Perceived work intensity	0.34	5.12	<0.001
Perceived work intensity → Attractiveness of the teaching profession	-0.27	4.56	<0.001
Digital fatigue → Attractiveness of the teaching profession	-0.19	3.07	<0.01
Perceived technology empowerment → Perceived occupational prestige	0.29	4.87	<0.001
Human-machine collaboration experience → Perceived occupational prestige	0.21	3.45	<0.001
Perceived occupational prestige → Attractiveness of the teaching profession	0.31	5.34	<0.001
Technology anxiety → Attractiveness of the teaching profession	-0.11	1.83	0.07
Perceived technology empowerment → Attractiveness of the teaching profession	0.08	1.26	0.21

The bootstrap mediation test results indicated that the indirect effect of perceived work intensity on the relationship between technology anxiety and the attractiveness of the teaching profession was -0.092 (95% confidence interval (CI) [-0.148, -0.047]). The indirect effect of perceived occupational prestige on the relationship between perceived technology empowerment and the attractiveness of the teaching profession was 0.090 (95% CI [0.052, 0.136]). The indirect effect of perceived occupational prestige on the relationship between human-machine collaboration experience and the attractiveness of the teaching profession was 0.065 (95% CI [0.033,0.104]). These results demonstrated that digital intelligence factors indirectly influenced the attractiveness of the teaching profession through the mediating transmission of traditional factors, and both the stress pathway and the empowerment pathway were supported.

Research question 3: Multigroup analysis

To examine differences in the influence pathways across different groups, this study conducted a multigroup analysis using teaching experience, school type, and school stage as grouping variables. The chi-square difference ($\Delta\chi^2$) between the unconstrained model and

the model with equality constraints on the paths was compared to test whether the path coefficients differed significantly across groups. During to the limited sample size for senior secondary school teachers (n=40), only the primary and junior secondary school stages were included.

(1) Teaching experience differences

The model comparison showed $\Delta\chi^2=18.34$, $\Delta df=10$, $p<0.05$. The path coefficients on the stress pathway were significantly higher for early-career teachers than for experienced teachers (technology anxiety → perceived work intensity: $\beta=0.42$ vs 0.21, $\Delta\chi^2=6.52$, $p< 0.05$), indicating that early-career teachers are more sensitive to technology-related stress. On the occupational prestige pathway, the effect of occupational prestige on the attractiveness of the teaching profession was significantly stronger among experienced teachers than among early-career teachers ($\beta=0.38$ vs. 0.22, $\Delta\chi^2=5.87$, $p<0.05$), suggesting that experienced teachers value social recognition more.

(2) School type differences

$\Delta\chi^2=12.07$, $\Delta df=5$, $p<0.05$. The effect of perceived technology empowerment on occupational prestige was significantly higher for urban teachers than for township teachers ($\beta=0.34$ vs. 0.19, $\Delta\chi^2=4.23$, $p<0.05$). The effect of salary satisfaction on the attractiveness of the teaching profession was higher for township teachers than for urban teachers ($\beta=0.33$ vs. 0.21, $\Delta\chi^2=4.86$, $p<0.05$), indicating that township teachers are more sensitive to material compensation.

(3) School stage differences

$\Delta\chi^2=9.21$, $\Delta df=5$, $p=0.10$. The negative effect of perceived work intensity on the attractiveness of the teaching profession was significantly stronger for junior secondary school teachers than for primary school teachers ($\beta=-0.34$ vs. -0.19, $\Delta\chi^2=4.52$, $p<0.05$), which may be related to the academic advancement pressure in junior secondary schools. No significant differences were found for the remaining paths.

Overall, early-career teachers were more sensitive on the technology stress pathway, while experienced teachers were more driven by occupational prestige. Urban teachers benefited more from technology empowerment, whereas township teachers relied more heavily on salary. Junior secondary school teachers faced greater work intensity pressure than primary school teachers. These findings provide a reference for the formulation of differentiated policies.

Discussion

This study finds that the overall attractiveness of the teaching profession is currently at a moderate level, yet considerable differences exist among the specific indicators measured. Salary satisfaction is the weakest component, whereas perceived work intensity is relatively high. Thus, insufficient financial security and excessive workload remain key factors affecting the occupational attractiveness of teachers. This result is broadly consistent with existing international research. Previous studies have pointed out that teacher occupational attractiveness is influenced not only by professional mission and social value but also by external factors such as salary levels, working conditions, and career development opportunities. Teacher occupational attractiveness is related to social value and professional mission, and it is also governed by external factors such as remuneration, working conditions, and career growth prospects [24]. The present study identifies salary satisfaction as the weakest link among the traditional factors; that is, even though teachers are engaged in a profoundly meaningful endeavor, material security remains a foundational element in sustaining attractiveness. This view may stem from a dual consideration involving value judgments about the teaching profession and cost-benefit trade-offs. If teachers perceive that they invest much but receive little and that professional rewards are inadequate, neither their sense of identification nor their willingness to remain in the long-term profession is likely to be solid. It follows that relying solely on the promotion of professional ethics is insufficient to enhance the attractiveness of the teaching profession, and greater effort should be directed toward constructing a more rational and stable remuneration system.

At the same time, digital-intelligence factors do not influence teacher occupational attractiveness in a single direction but rather exert a dual effect. Phenomena such as technology anxiety and digital fatigue can weaken occupational attractiveness by increasing teachers' perceived work intensity. Conversely, a sense of technology empowerment can enhance professional prestige and positively contribute to teachers' value judgments. The findings thus supplement the traditional

approach that explains teacher occupational attractiveness in terms of salary, working conditions, and social prestige. Existing research indicates that the digital transformation of education can provide new opportunities for teacher career development by improving teaching efficiency, promoting resource sharing, and supporting teachers' professional growth [25]. However, technological change may also increase teachers' learning costs, blur work boundaries, and create technology adaptation pressure, thereby generating new professional burdens [26]. The results of this study further demonstrate that digital technology per se does not necessarily enhance teacher occupational attractiveness; the actual effect depends on teachers' user experiences. When technology constitutes an additional administrative task or an assessment indicator, it may become a new job demand; yet when it proves genuinely useful in teaching or professional work, it can instead serve as a resource-based facilitator. This aligns with the core proposition of the JD-R model, namely that job resources can buffer the negative impact of job demands and promote positive professional experiences.

This study also reveals that, in the era of digitalization and smart technologies, the transformation of educational approaches takes on new significance for teacher occupational attractiveness. Reflections on artificial intelligence, digital education, and innovative talent cultivation have prompted teachers to evolve from mere knowledge transmitters into learning designers, innovation facilitators, or growth assistants. Creative teaching itself is currently a key focus of teacher professional development; it may enhance their sense of professional value, yet it can also be an unresolved source of stress. Prior research suggests that teachers' creative teaching behaviors can foster students' creative thinking and strengthen teachers' professional growth experiences [27]. However, if schools lack corresponding training, resource support, and evaluation mechanisms, innovative teaching requirements may be perceived by teachers as additional tasks, thereby increasing their workload. According to the analysis in this study, the transformation of educational approaches should not be viewed merely as an increase in responsibilities. Rather, teacher support policies should be aligned to foster the development of creative capacities, making this transformation a facilitator of professional identity rather than a new source of pressure. Furthermore, the pathways through which occupational attractiveness is experienced differ across teacher groups. Young teachers are relatively more prone to technology anxiety, whereas veteran teachers generally prioritize professional prestige and the meaning of career development. Urban teachers can more readily use technological means to gain convenience, while township and village teachers rely more heavily on salary stability. It follows that teacher occupational attractiveness cannot be explained by a single mechanism; it is related to teachers' career stages, school locations, and resource allocation. Relevant research points out that teacher career development exhibits distinct stages; young teachers are typically in the phase of professional adaptation and competence building and are more susceptible to the effects of work stress and role transition [28]. Meanwhile, the uneven distribution of digital educational resources may also lead to differences in the technology application experiences of teachers across different regions [29]. Therefore, teacher support policies need to break away from the "one-size-fits-all" model and provide accurate, targeted assistance according to the actual needs of different groups.

Conclusion

Based on the job demands-resources model, this study uses a mixed-method approach that combines questionnaire surveys and semi-structured interviews. It comprehensively explores the occupational attractiveness of primary and secondary school teachers in Zhejiang Province and relevant influencing factors. The main conclusions are as follows: First, the overall occupational attractiveness of teachers is at a moderate level, but insufficient salary satisfaction and heavy workload clearly impose significant constraints on attractiveness, indicating that traditional occupational security factors still retain fundamental importance. Second, digital-intelligence factors influence teacher occupational attractiveness through a stress-empowerment dual pathway: Technology anxiety and digital fatigue may leave teachers feeling burdened and reduce their professional satisfaction. However, teachers who can leverage technology and engage in smooth human-AI collaboration develop a stronger sense of professional worth, which in turn boosts occupational attractiveness. Third, the influencing factors encountered

vary across teacher groups; young teachers, urban teachers, and teachers at different school stages all have specific needs arising from digitalization and smart transformation, so teacher support policies must pay greater attention to analyzing and addressing group differences.

Overall, teacher occupational attractiveness in the so-called digital-intelligence era cannot be attained merely through high remuneration or the simple addition of technology. Instead, material, professional, technological, and expertise-related factors all need to develop in a synchronized manner.

Developing an incentive system that places equal emphasis on salary security and digital-intelligence support. Teacher occupational attractiveness is first and foremost built on a foundation of stable professional security. Education administrative departments should further improve the mechanism for teacher salary growth and enhance the alignment between the value of teachers' work and their professional rewards. Meanwhile, the digitalization of education should not be simplistically equated with investment in technological equipment; instead, attention should be paid to teachers' actual user experiences, and a digital education support system that integrates technical support, resource provision, and evaluation optimization should be established. Furthermore, the cultivation of creative teaching competence should be incorporated into the teacher professional development system, and institutional support should be used to increase teachers' motivation to engage in innovative teaching.

Optimizing the school's digital-intelligence management ecosystem and reduce teachers' non-teaching workload. As a key environment shaping teachers' professional experiences, schools should plan digital application scenarios rationally and avoid behaviors such as duplicate data reporting and excessive data collection that cause digital fatigue. School administrators should provide tiered support based on differences in teachers' years of experience, subject areas, and technological competence, for instance, strengthening technical application guidance for young teachers while reducing technology adaptation pressure for veteran teachers. At the same time, a school culture that encourages pedagogical innovation should be cultivated so that digital technology genuinely serves classroom improvement and teachers' professional growth.

Teacher training is the core pathway for enhancing teachers' digital-intelligence literacy and creative teaching competence. In response to problems such as the "one-size-fits-all" approach and the emphasis on technology over methodology in current training, a tiered and categorized training system should be constructed. Implement stratified training by designing three-level curricula based on teachers' years of experience, digital literacy foundations, and subject characteristics: teachers with longer teaching experience and a weak digital foundation should focus on basic digital skills training. Young teachers should concentrate on deepening their technology application abilities and key backbone teachers should focus on developing innovative technology application and trainer capabilities. A dynamic mechanism for assessing training needs should also be established to avoid a "supply-demand mismatch". At the same time, creative pedagogy should be integrated into training content, changing the dual-separation model of "technical operation plus subject teaching" and guiding teachers to use technology to support project-based learning, interdisciplinary curriculum design, and open-ended assessment. Drawing on the United Kingdom (UK)'s careers in initial teacher education (CITE) teacher training model, internationally established methods such as possibility thinking training and design thinking workshops should be introduced. In terms of training formats, an integrated system encompassing pre-service cultivation, in-service professional development, and resource support, as well as regional platforms for teacher innovation and development, should be established. This enables teachers to address technological challenges, capitalize on opportunities brought by educational transformation, and achieve simultaneous improvements in professional competence and professional identity.

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Conflicts of Interest

The authors declare no conflict of interest.

References

[1] Mayer, D., Goodwin, A. L., Mockler, N. (2021) Teacher education policy: future research, teaching in contexts of super-diversity and early career teaching. *Teacher Education Policy and Research: Global Perspectives*, 209-223.

[2] Sandoval-Obando, E., Fuentes-Vilugrón, G., Castellanos-Alvarenga, L., Etchegaray-Pezo, P., Lamas-Aicon, M. (2026) Teaching engagement and technostress among primary and secondary school teachers: a systematic review. *Education Sciences*, 16(3), 422.

[3] Thomas Dotta, L., Rodrigues, S., Joana, L., Carvalho, M. J. (2025) The attractiveness of the teaching profession: a integrative literature review. *Frontiers in Education*, 9, 1380942.

[4] An X. (2018) Teacher salaries and the shortage of high-quality teachers in China's rural primary and secondary schools. *Chinese Education & Society*, 51(2), 103-116.

[5] Pham, L. D., Nguyen, T. D., Springer, M. G. (2021) Teacher merit pay: a meta-analysis. *American Educational Research Journal*, 58(3), 527-566.

[6] Wang, Y., Xia, Q., Yue, H., Teng, W. (2024) Chinese rural kindergarten teachers' work-family conflict and their turnover intention: the role of emotional exhaustion and professional identity. *Behavioral Sciences*, 14(7), 597.

[7] Daliri-Ngametua, R., Hardy, I., Creagh, S. (2022) Data, performativity and the erosion of trust in teachers. *Cambridge Journal of Education*, 52(3), 391-407.

[8] Tarafdar, M., Tu, Q., Ragu-Nathan, T. S., Ragu-Nathan, B. S. (2014) The impact of technostress on role stress and productivity. *Journal of Management Information Systems*, 24(1), 301-328.

[9] Liu, R., Li, X. (2026) Digital technology anxiety and teacher digital literacy development: a longitudinal examination of cognitive appraisal mechanisms. *BMC Psychology*, 14(1), 527.

[10] Li, Y., Cheng, H., Qin, Q. (2025) Evaluations and improvement methods of deep learning ability in blended learning. *International Journal of e-Collaboration (IJeC)*, 21(1), 1-17.

[11] Estrada-Muñoz, C., Vega-Muñoz, A., Castillo, D., Müller-Pérez, S., Boada-Grau, J. (2021) Technostress of Chilean teachers in the context of the COVID-19 pandemic and teleworking. *International Journal of Environmental Research and Public Health*, 18(10), 5458.

[12] Akram, H., Abdelrady, A. H., Al-Adwan, A. S., Ramzan, M. (2022) Teachers' perceptions of technology integration in teaching-learning practices: a systematic review. *Frontiers in Psychology*, 13, 920317.

[13] Pahi, K., Hawlader, S., Hicks, E., Zaman, A., Phan, V. (2024) Enhancing active learning through collaboration between human teachers and generative AI. *Computers and Education Open*, 6, 100183.

[14] Craft, A. R., Chappell, K. A. (2016) Possibility thinking and social change in primary schools. *Education 3-13*, 44(4), 407-425.

[15] Lucas, B. (2025) Understanding, embedding and assessing complex competences such as Creative Thinking. *Well Educated: Leading Schools with Wonder, Joy and Wisdom*, 149-161.

[16] Lucas, B. (2025) PISA 2022 creative thinking assessment: a landmark opportunity for school and system leaders to put creativity at the heart of students' learning. *The Journal of Creative Behavior*, 59(4), e70067.

[17] Wang, J., Tigelaar, D. E., Luo, J., Admiraal, W. (2022) Teacher beliefs, classroom process quality, and student engagement in the smart classroom learning environment: a multilevel analysis. *Computers & Education*, 183, 104501.

[18] Yildirim, A. (2026) Managerial innovation and organizational creativity in education: a comparative study of Turkey and Ukraine. *Journal of Vasyl Stefanyk Precarpathian National University*, 13(1), 68-85.

[19] Huang, X. (2024) Constructing the associations between creative role identity, creative self-efficacy, and teaching for creativity for primary and secondary teachers. *Psychology of Aesthetics, Creativity, and the Arts*, 18(4), 523.

[20] Demerouti, E., Bakker, A. (2023) Job demands-resources theory in times of crises: new propositions. *Organizational Psychology Review*, 13(3), 209-236.

[21] Zhang, J., Su, H., Pu, D., Li, P. (2026) Job

satisfaction among Chinese secondary school teachers: a two-wave longitudinal study using the job demands-resources model. *Journal of School Psychology*, 116, 101558.

[22] Woods, S., Sebastian, J., Herman, K. C., Huang, F. L., Reinke, W. M., Thompson, A. M. (2023) The relationship between teacher stress and job satisfaction as moderated by coping. *Psychology in the Schools*, 60(7), 2237-2256.

[23] Hussain, M. S., Khan, S. A., Bidar, M. C. (2022) Self-efficacy of teachers: a review of the literature. *Multi-Disciplinary Research Journal*, 10(1), 110-116.

[24] Podolsky, A., Kini, T., Darling-Hammond, L., Bishop, J. (2019) Strategies for attracting and retaining educators: What does the evidence say? *Education Policy Analysis Archives*, 27, 38.

[25] Vičič Krabonja, M., Kustec, S., Skrbinjek, V., Aberšek, B., Flogie, A. (2024) Innovative professional learning communities and sustainable education practices through digital transformation. *Sustainability*, 16(14), 6250.

[26] Dahabiyeh, L., Najjar, M. S., Wang, G. (2022) Online teaching during COVID-19 crisis: the role of technostress and emotional dissonance on online teaching exhaustion and teaching staff productivity. *The International Journal of Information and Learning Technology*, 39(2), 97-121.

[27] Chen, S. Y., Lai, C. F., Lai, Y. H., Su, Y. S. (2022) Effect of project-based learning on development of students' creative thinking. *The International Journal of Electrical Engineering & Education*, 59(3), 232-250.

[28] Keller-Schneider, M., Zhong, H. F., Yeung, A. S. (2020) Competence and challenge in professional development: teacher perceptions at different stages of career. *Journal of Education for Teaching*, 46(1), 36-54.

[29] Li, M. (2025) Exploring the digital divide in primary education: a comparative study of urban and rural mathematics teachers' TPACK and attitudes towards technology integration in post-pandemic China. *Education and Information Technologies*, 30(2), 1913-1945.