



Digital flourishing and occupational stress among kindergarten teachers: A moderated mediation analysis

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Abstract: The study investigated whether digital flourishing buffers occupational stress among Chinese kindergarten teachers, through psychological resilience and thriving at work. The study sample comprised 1914 kindergarten teachers across China (females = 79.68%; the largest age group was 36–45 years, 38.92%). Survey data were analyzed using structural equation modeling and multi-group analysis. Results indicated that digital flourishing was associated with lower occupational stress. Psychological resilience partially mediated this relationship for lower occupational stress. Thriving at work significantly moderated both the digital flourishing-to-resilience pathway and the direct digital flourishing-to-stress relationship for teachers high in work thriving. The model was robust across urban and rural settings. These findings are consistent with the Job Demands-Resources (JD-R) model and Conservation of Resources (COR) theory. Positive digital experiences and workplace vitality synergistically mitigate early childhood educators' occupational stress. Interventions for teacher work wellbeing should sequence thriving-supportive measures (e.g., workload audits, online professional learning circles) before expanding digital engagement initiatives.

Keywords: Digital flourishing; occupational stress; psychological resilience; thriving at work; kindergarten teachers

Introduction

In today's demanding educational context with high emotional labor and limited staffing, this additional cognitive load may deplete teachers' psychological resources, triggering burnout and turnover intentions (Bon & Shire, 2022). Digital technology is the new normal at workplaces, and it is worth studying in regard to teacher work wellbeing. Janicke-Bowles et al. (2023) defined digital flourishing as individuals' positive perceptions of their experiences and behaviors in computer-mediated social interactions, manifested across five interrelated dimensions: (a) connectedness—a sense of meaningful social bonding through digital channels; (b) authentic self-presentation—the ability to express one's genuine self online; (c) civil participation—constructive engagement in online discourse; (d) positive social comparison—deriving inspiration rather than envy from others' online content; and (e) self-control—the capacity to regulate one's digital use. This five-dimensional structure is directly captured by the 21-item Digital Flourishing Scale used in the present study (Janicke-Bowles et al., 2023; Rosič et al., 2022), thereby ensuring construct-measure alignment. Kindergarten teaching combines caregiving, instructional, and parent-liaison responsibilities in ways that general teacher stress scales developed for primary or secondary settings cannot fully capture (Whitaker et al., 2015; Liu et al., 2024). These domains are central, particularly within the home-school digital communication ecosystem.

Despite this growing interest, several gaps persist in the literature. Empirical research on digital flourishing among educators remains scarce, and the psychological mechanisms—such as the mediating role of psychological resilience—through which positive digital experiences

translate into stress relief are poorly understood (Masten, 2001; Tugade & Fredrickson, 2004). Whether thriving at work moderates these resource-conversion processes, and whether the proposed mechanisms generalize across China's pronounced urban-rural digital divide (Guo & Wan, 2022), remain open questions.

To address these gaps, the present study tests a moderated mediation model in which digital flourishing reduces occupational stress through psychological resilience, with thriving at work as the moderator. The model is examined separately for urban and rural Chinese kindergarten teachers.

Digital flourishing and occupational stress

Teacher occupational stress is a pervasive negative emotional experience characterized by tension, frustration, and despondency resulting from prolonged exposure to workplace stressors (Kyriacou, 1987; Yao, 2005). While teaching is globally recognized as a high-stress profession (Boyle et al., 1995), the consequences are uniquely detrimental in early childhood education. Excessive occupational stress not only undermines kindergarten teachers' professional identity and mental health but also diminishes the quality of teacher-child interactions, ultimately impeding children's socio-emotional development (Jeon et al., 2018; Pakarinen et al., 2010; Whitaker et al., 2015). More recently, the rapid digitalization of education has introduced novel occupational demands. Preschool educators increasingly report heightened stress associated with online teaching practices and the blurring of work-life boundaries (Keleynikov et al., 2022; Liu et al., 2024). Despite this emerging challenge, empirical research on technostress remains heavily skewed toward primary,



secondary, and higher education, leaving a critical gap in the preschool context (Zhu et al., 2023). Kindergarten teachers must simultaneously deliver caregiving and instruction, manage high parental expectations, and absorb the additional load created by digital home–kindergarten communication platforms. Investigating the role of digital flourishing in buffering occupational stress among this underrepresented population is therefore of considerable theoretical and practical value (Santiago-Torner et al., 2025).

The mediating role of psychological resilience

Psychological resilience—the dynamic capacity to recover from significant stress (Masten, 2001)—constitutes a critical personal work participation resource. Specifically, confidence in digital skills bolsters teacher self-efficacy, a core component of psychological resilience (Bandura, 1997), while deriving positive meaning from technology use builds psychological capital that supports resilience (Luthans & Youssef-Morgan, 2017). Priyadharshini and Robinson-Pant (2003) further showed that positive professional experiences strengthen teachers' resilience and help them overcome occupational difficulties.

Concurrently, the buffering effect of psychological resilience on occupational stress is well-established empirically. High psychological resilience operates as a protective mechanism against stress disorders (Tugade & Fredrickson, 2004) and alleviates mental tension by regulating emotional responses (Southwick & Charney, 2012). Meta-analyses have confirmed a significant negative association between resilience and stress (Hu et al., 2015). Together, these findings suggest that digital flourishing may reduce occupational stress not only directly but also indirectly, by cultivating psychological resilience as a secondary resource.

The moderating role of thriving at work

While digital flourishing enhances resilience, the efficiency of this resource conversion may vary significantly among individuals. Thriving at work, defined as an individual's sustained high energy and sense of learning at work (Porath et al., 2012), represents a key resource that possesses both individual and job attributes (Bakker & Demerouti, 2017). Thriving at work—a personal resource encompassing vitality and learning (Porath et al., 2012)—therefore functions as a conversion-enhancing resource: when teachers are energetically engaged, the contextual resource of digital flourishing is more readily transduced into the personal resource of psychological resilience. From a COR standpoint, this represents a resource caravan dynamic (Hobfoll, 2011), whereby co-occurring resources accelerate gain spirals. Empirical work consistent with this prediction includes Lesener, Gusy & Wolter's (2019) meta-analytic evidence on the cross-situational stability of resource–resource interactions. Conversely, for teachers experiencing low thriving, the conversion of digital resources into resilience is constrained by insufficient activating resources.

Beyond the resilience-building pathway, thriving at work may also moderate the direct digital flourishing–occupational stress relationship. We expect this

moderation to operate asymmetrically. At high thriving, the JD-R resource $\times$ resource principle (Bakker & Demerouti, 2017) predicts that vitality and learning resources enable teachers to mobilize digital flourishing as an immediate stress-buffering tool. At low thriving, however, two mechanisms predict a potential reversal. First, COR theory's resource investment paradox (Hobfoll et al., 2018) holds that depleted individuals incur disproportionate costs when deploying new resources; for them, engaging in digitally mediated interactions may consume rather than replenish reserves. Second, the JD-R resources-as-demands mechanism (Bakker & de Vries, 2021) predicts that, within China's "always-on" home–school communication culture (e.g., WeChat parent groups), the same digital affordances may be cognitively reappraised as obligations for low-thriving teachers.

Theoretical framework

This study is anchored in two complementary resource-based theories: the Job Demands–Resources (JD-R) model (Bakker & Demerouti, 2007) and Conservation of Resources (COR) theory (Hobfoll, 1989). Together, these two frameworks provide a sufficient and integrated basis for all hypothesized relationships; we therefore refrain from invoking additional theories as core explanatory machinery.

Within the JD-R framework, the "resource $\times$ resource" interaction proposition suggests that higher-order resources can synergistically amplify the utility of initial resources (Hobfoll et al., 2018). This logic aligns with the "resource amplifier" perspective in COR theory (Hobfoll, 2011). The moderating role of thriving at work on the digital flourishing–resilience pathway follows directly from the resource interaction logic shared by JD-R and COR. Within JD-R, the resource $\times$ resource principle holds that the convertibility of one resource into another is contingent upon the simultaneous availability of additional resources (Bakker & Demerouti, 2017; Hobfoll et al., 2018).

Specifically, the JD-R model supplies the direct buffering proposition: job resources offset the adverse effects of job demands on strain outcomes, predicting that digital flourishing—as a contextual resource—reduces occupational stress. COR theory supplies the resource gain spiral proposition: initial resources catalyze the acquisition of secondary resources, predicting that digital flourishing fosters psychological resilience, which in turn mediates the stress-buffering pathway. Both frameworks converge on the resource interaction proposition. JD-R's "resource $\times$ resource" principle (Hobfoll et al., 2018) and COR's resource caravan logic (Hobfoll, 2011) predict that thriving at work, itself a co-occurring resource, amplifies both the indirect and direct effects of digital flourishing. Other theoretical traditions consulted in the literature (e.g., Broaden-and-Build theory; technostress research) are treated as supporting empirical context rather than core predictive machinery.

The China context

In China, educational digitization has been elevated to a national strategic priority (Dong et al., 2020). Digital

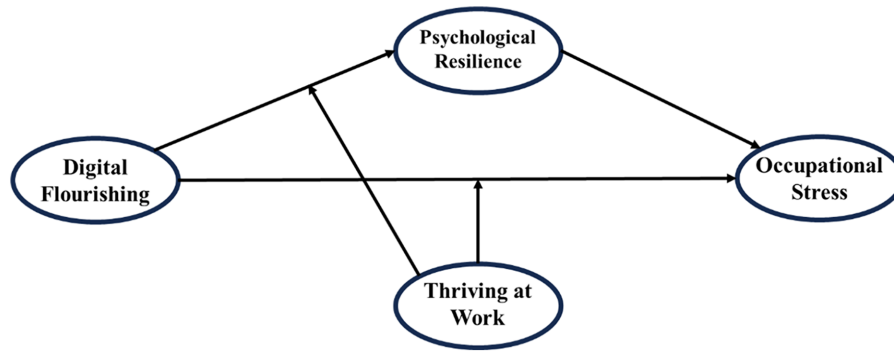


Figure 1. Theoretical model

technology has expanded teachers' access to pedagogical resources and professional development (Santiago-Torner et al., 2025). At the same time, the pervasive integration of instant messaging tools (e.g., WeChat, DingTalk) has normalized an "always-on" professional state, contributing to technostress and digital fatigue (Granziera et al., 2021). Beyond individual psychological factors, the pronounced urban-rural digital divide in China's educational landscape necessitates comparative attention. Rural kindergartens often face tighter structural constraints and limited access to professional networks compared to their urban counterparts (Guo & Wan, 2022). Consequently, digital channels may play a more critical role in providing professional support for rural teachers, potentially altering the efficiency of resource transformation. Whether the hypothesized relationships hold equivalently across geographic contexts, however, remains an open empirical question.

The present study

The present study investigated whether digital flourishing buffers occupational stress among Chinese kindergarten teachers, through psychological resilience and thriving at work. It addresses the following research question and hypotheses based on a theory informed conceptual model (see Figure 1):

RQ1: Does the proposed moderated mediation model operate equivalently across urban and rural kindergarten teacher samples, or do the resource-conversion pathways differ by geographic context?

Our specific research hypotheses were as follows among Chinese kindergarten teachers:

H1: Digital flourishing is associated with lower teachers' occupational stress.

H2: Psychological resilience mediates the relationship between digital flourishing and occupational stress for lower occupational stress.

H3a: Thriving at work moderates the digital flourishing-resilience relationship (stronger at high thriving) for lower occupational stress.

H3b: Thriving at work moderates the direct digital flourishing-stress relationship (buffering strongest at high thriving, potentially reversed at low thriving).

Methods

Participants and setting

Participants were 1914 Chinese kindergarten teachers (see Table 1 for demographics). This sample size substantially exceeds the recommended minimum threshold and satisfies the criterion of at least five times the number of scale items for structural equation modeling (Hair et al., 2010), providing adequate statistical power for the planned analyses.

Measures

Digital flourishing

Digital flourishing was assessed using the 21-item Chinese version of the Digital Flourishing Scale (C-DFS), adapted from Janicke-Bowles et al. (2023) and previously validated in the Chinese context (Wang & Yu, 2025). Responses are scored on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Example items include "I feel comfortable and can express my authentic self when interacting online." Higher scores reflect greater levels of digital flourishing. In the current sample, scores from the scale demonstrated excellent internal consistency (Cronbach's $\alpha = 0.967$).

Thriving at work

Teachers' thriving at work was measured using an 8-item scale adapted for the kindergarten context from Porath et al. (2012). Items (e.g., "I feel alive and vital, like I want to burst with energy") were rated on a 7-point Likert scale. Higher composite scores represent elevated levels of work thriving. Scores from the scale exhibited high reliability (Cronbach's $\alpha = 0.929$).

Psychological resilience

Psychological resilience was evaluated using the 10-item Chinese version of the Ego-Resiliency Scale (Yu & Zhang, 2007). Participants responded on a 4-point Likert scale to statements such as "I become stronger through accumulated experience." Higher scores denote stronger psychological resilience. Scores from the measure showed strong internal consistency (Cronbach's $\alpha = 0.928$).

Occupational stress

Occupational stress was assessed using the 41-item Teacher Occupational Stress Questionnaire originally developed by Zhu et al. (2002) and contextualized for the

Table 1. Descriptive statistics of the sample (N = 1914)

Variable	Category	N	Percentage
Gender	Female	1525	79.68%
	Male	389	20.32%
Staffing status	Established post	340	17.76%
	Non-established post	1574	82.24%
Age	25 years and below	161	8.41%
	26–35 years	576	30.09%
	36–45 years	745	38.92%
	46 years and above	432	22.57%
Years of teaching experience	5 years or less	550	28.74%
	6–10 years	544	28.42%
	More than 10 years	820	42.84%
Educational attainment	Associate degree or below	1052	54.96%
	Bachelor's degree or above	862	45.04%
Location	Urban	1303	68.08%
	Rural	611	31.92%
Geographic region	Eastern China	1050	54.86%
	Central China	377	19.70%
	Western China	253	13.22%
	Northeastern China	234	12.23%
Professional title	Unranked	309	16.14%
	Junior	1285	67.14%
	Middle/Senior	320	16.72%
Academic background	Preschool education major	1205	62.96%
	Non-preschool education major	709	37.04%
Kindergarten type	Public	1064	55.59%
	Non-public	850	44.41%

kindergarten setting. This comprises five domains most relevant to early childhood educators' work demands: (a) teaching pressures (e.g., curriculum delivery, lesson preparation), (b) child-related stressors (e.g., behavior management, individual differences, safety responsibilities), (c) personal development needs (e.g., professional growth opportunities, career advancement), (d) family and interpersonal relationships (e.g., home–work conflict, colleague and parent relations), and (e) workload (e.g., administrative duties, long working hours, digitalized home–school communication tasks). Items are scored on a 5-point Likert scale, with higher scores indicating greater perceived stress. The instrument's psychometric performance was strong in both a pilot study (N = 129; Cronbach's $\alpha = 0.883$, KMO = 0.715, Bartlett's $p < 0.05$) and the main sample (overall $\alpha = 0.987$; all subscale α s > 0.89), supporting its reliability and structural adequacy for the present population.

Procedure

This study was approved by the Research Ethics Committee of Northeast Normal University. All procedures were conducted in accordance with the Declaration of Helsinki. Data were collected via an anonymous online questionnaire distributed through the Wenjuanxing platform from May 2025 to June 2025. Before participation, all teachers were informed of the study's purpose, the voluntary nature of participation, and their right to withdraw at any time

without penalty. Informed consent was obtained electronically from all participants prior to data collection, and no personally identifying information was recorded.

Data analysis

Analyses were conducted using SPSS 27.0 and AMOS 29.0. Descriptive statistics and bivariate correlations were initially computed. The measurement model's construct validity was evaluated via confirmatory factor analysis (CFA) in AMOS. The proposed moderated mediation model was subsequently tested using structural equation modeling (SEM) in AMOS 29.0. To estimate conditional indirect effects, a 5000-sample bootstrapping procedure was implemented using Hayes' (2018) PROCESS macro. Statistical significance was determined by the absence of zero within the 95% bias-corrected confidence intervals. Additionally, multi-group analysis was conducted using AMOS to examine the consistency of the structural relationships across urban and rural teacher groups. Prior to formal nationwide data collection, a pilot study was conducted with a regional subsample. A total of 132 questionnaires were distributed, of which 129 were valid (effective response rate: 97.72%). Cronbach's alpha for the full instrument was 0.883, indicating good internal consistency. The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was 0.715, and Bartlett's test of sphericity was significant ($p < 0.05$), confirming the data's suitability for factor analysis and supporting use of the questionnaire in subsequent nationwide data collection.

Table 2. Means, standard deviations, and correlations among variables

Variable	M	SD	1	2	3	4
1. Digital flourishing	3.01	1.06	—			
2. Work thriving	4.26	1.35	0.298***	—		
3. Psychological resilience	2.36	0.91	0.274***	0.238***	—	
4. Occupational stress	1.84	1.13	−0.309***	−0.302***	−0.304***	—

Note. *** $p < 0.001$.

Common method bias test

Several procedural and statistical safeguards were implemented to mitigate potential common method bias (CMB), as recommended by Podsakoff et al. (2003). Procedurally, we implemented three safeguards: (a) participants were assured of anonymity and informed there were no right or wrong answers, reducing evaluation apprehension; (b) items were grouped by scale and separated by brief instructional breaks to minimize response fatigue; and (c) all constructs were measured using established scales developed in independent research streams. Statistically, we first conducted Harman's single-factor test, which indicated that the first factor explained 39.92% of the total variance, just below the recommended 40% threshold. To provide a more rigorous assessment, we introduced a Common Latent Factor (CLF) into the measurement model. The baseline CFA model demonstrated a good fit to the data (CFI = 0.998, TLI = 0.998, RMSEA = 0.006). When the CLF was added to load simultaneously on all observed items, the inclusion of this method factor did not yield any substantive improvements in the model fit ($\Delta\text{CFI} < 0.001$, $\Delta\text{TLI} < 0.001$, $\Delta\text{RMSEA} < 0.001$), as all changes were well below the widely accepted threshold of 0.05 (Cheung & Rensvold, 2002). Therefore, these procedural and statistical tests suggest that common method bias does not pose a severe threat to the validity of the present findings.

Results

Descriptive statistics and correlation analysis

Descriptive statistics and bivariate correlations for all study variables are presented in Table 2. Digital flourishing was positively correlated with work thriving ($r = 0.298, p < 0.001$) and psychological resilience ($r = 0.274, p < 0.001$), and negatively correlated with occupational stress ($r = -0.309, p < 0.001$). Additionally, work thriving was positively associated with psychological resilience ($r = 0.238, p < 0.001$) and negatively associated with occupational stress ($r = -0.302, p < 0.001$). Psychological resilience also exhibited a significant negative correlation with occupational stress ($r = -0.304, p < 0.001$).

Digital flourishing effects on occupational stress

As predicted, digital flourishing had a significant negative direct effect on occupational stress ($B = -0.176, p < 0.001$). **H1** was therefore supported. We then examined the mediating and moderating pathways.

Moderated mediation analysis

We tested the proposed moderated mediation model utilizing structural equation modeling (SEM) in AMOS 29.0.

The structural model demonstrated an excellent fit to the data: $\chi^2 = 127.883$, $df = 80$, CFI = 0.997, TLI = 0.996, RMSEA = 0.018.

Path estimates (see Table 3) revealed that digital flourishing yielded a significant negative direct effect on occupational stress ($\beta = -0.176, p < 0.001$). Supporting the mediation hypothesis, digital flourishing positively predicted psychological resilience ($\beta = 0.232, p < 0.001$), which in turn negatively predicted occupational stress ($\beta = -0.166, p < 0.001$). Work thriving independently predicted both psychological resilience ($\beta = 0.148, p < 0.001$) and occupational stress ($\beta = -0.164, p < 0.001$). The interaction between digital flourishing and work thriving significantly predicted both psychological resilience ($\beta = 0.111, p < 0.001$) and occupational stress ($\beta = -0.274, p < 0.001$), indicating robust moderation. With respect to practical significance, although effect sizes varied in magnitude, they are substantively meaningful in the context of this large sample ($N = 1914$). A one standard deviation increase in work thriving would enhance the positive effect of digital flourishing on psychological resilience by approximately 11%, and amplify the stress-reducing effect on occupational stress by approximately 27%. Furthermore, improvements in psychological resilience not only directly reduce occupational stress but also reinforce the buffering role of digital flourishing, forming a positive resource conversion chain (Digital Flourishing $\rightarrow$ Psychological Resilience $\rightarrow$ Occupational Stress). These findings confirm the mediating role of psychological resilience and underscore work thriving as a critical moderating resource. Because digital flourishing significantly predicted resilience ($B = 0.232, p < 0.001$), which in turn predicted lower occupational stress ($B = -0.166, p < 0.001$), and the bias-corrected 95% CI for the indirect effect excluded zero, **H2** was supported.

Moderated mediation effects

To further elucidate the moderated mediation effects, conditional indirect effects were examined using a 5000-resample bootstrapping procedure (Table 4). The index of moderated mediation was significant (Index = 0.074, 95% CI [0.034, 0.121]). Specifically, the indirect effect of digital flourishing on occupational stress via psychological resilience was significant at both high (+1 SD; indirect effect = 0.190, 95% CI [0.126, 0.267]) and mean levels of work thriving (indirect effect = 0.102, 95% CI [0.069, 0.142]). However, this indirect effect became non-significant at low levels of work thriving (−1 SD; indirect effect = 0.040, 95% CI [−0.032, 0.118]). The schematic diagram of the moderated mediation model is presented in Figure 2.

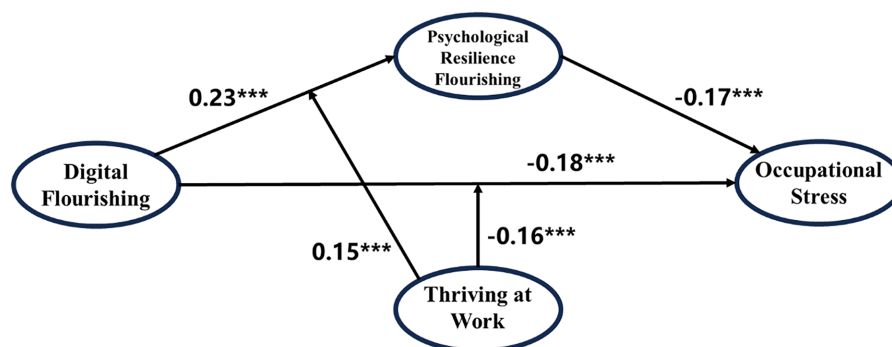
Table 3. Path estimates of the moderated mediation model

Path	Unstandardized coefficient (B)	Standardized coefficient (β)	S.E.	C.R.	<i>p</i>
Digital Flourishing $\rightarrow$ Psychological Resilience	0.188	0.232	0.024	7.813	***
Work Thriving $\rightarrow$ Psychological Resilience	0.102	0.148	0.021	4.874	***
Digital Flourishing $\times$ Work Thriving $\rightarrow$ Psychological Resilience	0.099	0.111	0.030	3.346	***
Psychological Resilience $\rightarrow$ Occupational Stress	-0.207	-0.166	0.032	-6.488	***
Digital Flourishing $\rightarrow$ Occupational Stress	-0.177	-0.176	0.026	-6.835	***
Work Thriving $\rightarrow$ Occupational Stress	-0.142	-0.164	0.022	-6.323	***
Digital Flourishing $\times$ Work Thriving $\rightarrow$ Occupational Stress	-0.305	-0.274	0.034	-9.019	***

Note. S.E. = Standard Error; C.R. = Critical Ratio; *** $p < 0.001$.

Table 4. Conditional direct and indirect effects at different levels of thriving at work (N = 1914)

Dependent variable	Moderator	Estimate	95% CI LL	95% CI UL	<i>P</i>
Occupational stress	High work thriving (+1 SD)	-0.648	-0.765	-0.542	<0.001
	Mean level	-0.253	-0.332	-0.179	<0.001
	Low work thriving (-1 SD)	0.142	0.030	0.261	0.012
	High work thriving (+1 SD)	0.390	0.264	0.527	<0.001
Psychological resilience	Mean level	0.232	0.175	0.288	<0.001
	Low work thriving (-1 SD)	0.074	-0.050	0.198	0.256

**Figure 2.** The mediating role of psychological resilience and the moderating role of thriving at work. Note. *** $p < 0.001$.

Simple slope analyses visually confirmed these interaction patterns (Figures 3 and 4). With respect to the digital flourishing–resilience pathway, the positive impact of digital flourishing on psychological resilience was significantly stronger at high levels of work thriving (simple slope = 0.390, $p < 0.001$). This effect was attenuated at mean levels (0.232, $p < 0.001$) and non-significant at low levels (0.074, $p = 0.256$). These patterns support **H3a**. With respect to the direct digital flourishing–occupational stress pathway, supporting **H3b**, the stress-buffering effect of digital flourishing on occupational stress was substantially amplified at high levels of work thriving (simple slope = -0.648, $p < 0.001$) relative to the mean (simple slope = -0.253, $p < 0.001$) and low levels (simple slope = 0.142, $p = 0.012$). Because the digital flourishing–resilience slope was significant and stronger at high than

at low thriving, **H3a** was supported. Because the digital flourishing–stress buffering effect was strongest at high thriving and reversed in direction at low thriving, **H3b** was also supported.

Multi-group comparison analysis

To examine the robustness of these findings across contexts, an urban–rural multi-group analysis was conducted (urban $n = 1303$; rural $n = 611$). The multi-group model exhibited a good fit ($\chi^2 = 226.293$, $df = 200$, $p = 0.098$, CFI = 0.998, TLI = 0.998, RMSEA = 0.008), supporting the structural equivalence of the proposed relationships across geographic settings.

As detailed in Tables 5 and 6, the overall moderated mediation structure was supported in both cohorts. However, contextual differences emerged in specific path

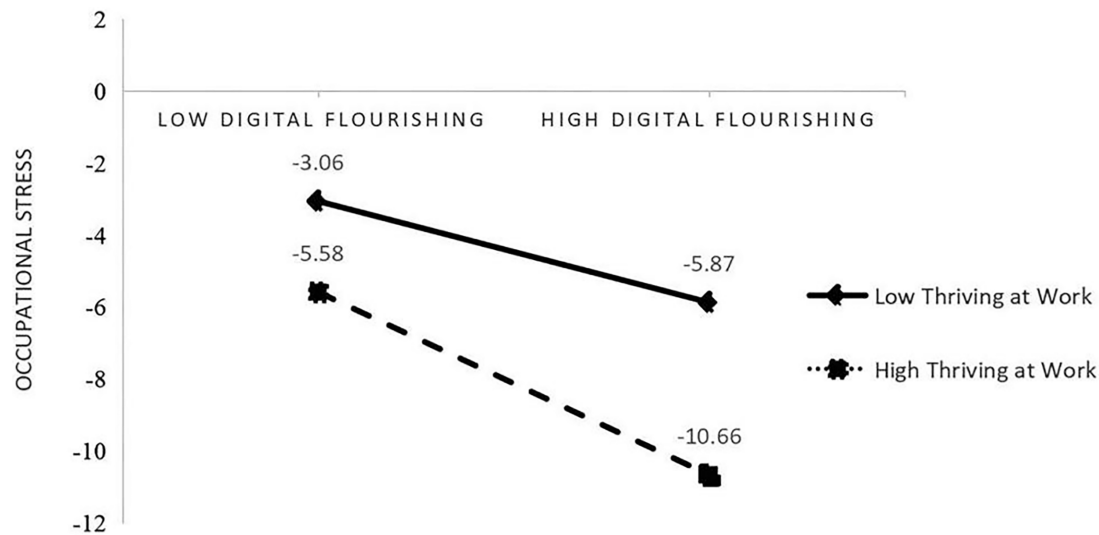


Figure 3. The moderating effect of thriving at work on the effect of digital flourishing on occupational stress. *Note.* $N = 1914$. $M \pm 1$ SD of thriving at work.

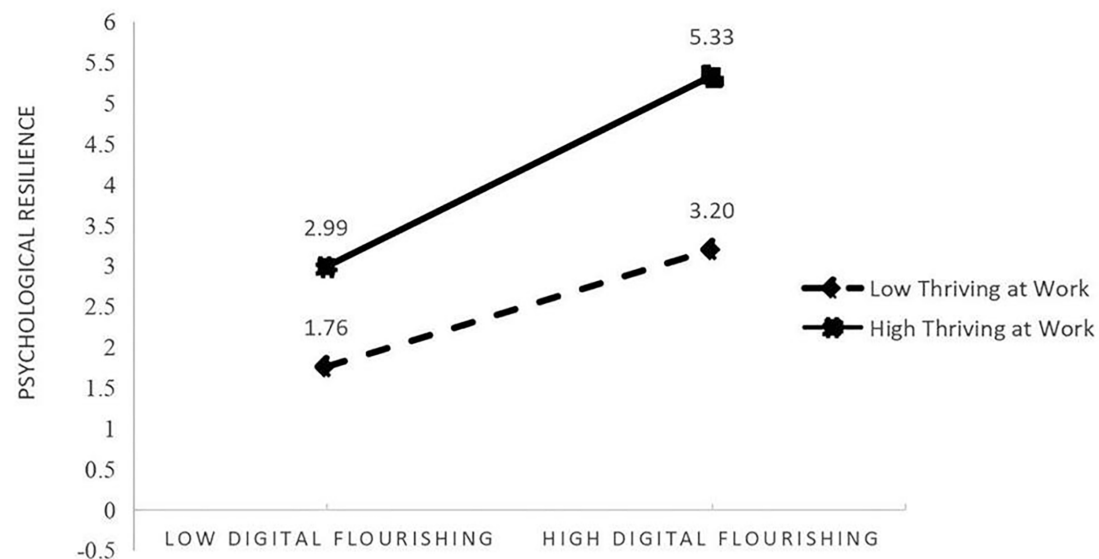


Figure 4. The moderating effect of thriving at work on the effect of digital flourishing on psychological resilience. *Note.* $N = 1914$. $M \pm 1$ SD of thriving at work.

magnitudes. The interaction effects of digital flourishing and work thriving were more pronounced among rural teachers for both psychological resilience (β rural = 0.162 vs. β urban = 0.086) and occupational stress (β rural = -0.316 vs. β urban = -0.255). Conversely, the direct effect of work thriving on psychological resilience was stronger among urban teachers (β urban = 0.171 vs. β rural = 0.105). These findings suggest that while the stress-buffering mechanism of digital flourishing is universal, the amplifying role of work thriving is particularly critical in resource-constrained rural contexts. Addressing **RQ1**, the overall moderated mediation model held in both urban and rural groups, but the moderating effect of thriving was significantly stronger among rural teachers; the model was thus structurally robust while showing meaningful contextual variation.

Discussion

As hypothesized, digital flourishing was significantly and negatively associated with occupational stress ($B = -0.176$, $p < 0.001$), supporting **H1**. This finding reframes digital technology in early childhood education from a primary source of technostress (Granziera et al., 2021) into a contextual job resource. The result is consistent with the JD-R premise introduced earlier, whereby positive digital experiences operate as job resources that offset job demands (Bakker & Demerouti, 2017), and aligns with prior evidence that meaningful digital engagement supports rather than depletes teacher well-being (Santiago-Torner et al., 2025). In China's WeChat-mediated home-school ecosystem, the quality of digital engagement appears more consequential for stress than its sheer quantity.

Table 5. Model fit indices for the urban–rural multi-group analysis

Index	CMIN	DF	<i>p</i>	CMIN/DF	GFI	RMSEA	CFI	NFI	TLI	AGFI	IFI
Recommended values	—	—	>0.05	<3	>0.90	<0.10	>0.90	>0.90	>0.90	>0.90	>0.90
Observed values	226.293	200.000	0.098	1.131	0.985	0.008	0.998	0.986	0.998	0.981	0.998

Table 6. Differences in path coefficients between urban and rural groups

Path	Urban (standardized) β	S.E.	C.R.	<i>p</i>	Rural (standardized) β	S.E.	C.R.	<i>p</i>
Digital flourishing → Psychological resilience	0.223	0.029	6.239	<0.001	0.251	0.042	4.873	<0.001
Thriving at work → Psychological resilience	0.171	0.025	4.645	<0.001	0.105	0.037	1.979	0.048
Digital flourishing × Thriving at work → Psychological resilience	0.086	0.035	2.162	0.031	0.162	0.052	2.796	0.005
Thriving at work → Occupational stress	−0.18	0.027	−5.732	<0.001	−0.135	0.039	−2.999	0.003
Psychological resilience → Occupational stress	−0.167	0.039	−5.427	<0.001	−0.158	0.057	−3.472	<0.001
Digital flourishing → Occupational stress	−0.177	0.031	−5.732	<0.001	−0.173	0.046	−3.847	<0.001
Digital flourishing × Thriving at work → Occupational stress	−0.255	0.039	−7.242	<0.001	−0.316	0.057	−6.252	<0.001

Supporting **H2**, psychological resilience partially mediated the link between digital flourishing and occupational stress: digital flourishing positively predicted resilience ($B = 0.232, p < 0.001$), which in turn predicted lower stress ($B = -0.166, p < 0.001$), and the bias-corrected 95% CI for the indirect effect excluded zero. This partial mediation supports COR's resource gain spiral (Hobfoll et al., 2018), introduced earlier: an initial contextual resource (digital flourishing) accrues into a personal resource (resilience) that buffers strain. The result echoes prior teacher research in which resilience transmits the benefits of workplace resources to reduced burnout (Hu et al., 2015; Richards et al., 2016). That the mediation was only partial suggests additional pathways (e.g., emotional regulation, social support) operate alongside resilience (Bakker & Demerouti, 2017).

Thriving at work amplified both the indirect pathway (from digital flourishing to occupational stress via psychological resilience) and the direct pathway (from digital flourishing to occupational stress). Supporting **H3a**, thriving at work significantly moderated the digital flourishing–resilience pathway (interaction $B = 0.099, p < 0.001$): the positive effect of digital flourishing on resilience was strong at high thriving (simple slope = 0.390, $p < 0.001$) but non-significant at low thriving (0.074, $p = 0.256$). Supporting **H3b**, thriving also moderated the direct digital flourishing–stress pathway: the buffering effect was strongest at high thriving (simple slope = −0.648, $p < 0.001$) and reversed at low thriving (0.142, $p = 0.012$). This amplification aligns with

evidence that thriving and engagement intensify the payoff of job resources for early childhood educators (Jeon et al., 2018; Cumming, 2017), and with studies linking preschool teacher vitality to lower burnout (Hall-Kenyon et al., 2014). These patterns are consistent with the resource × resource interaction logic introduced earlier, whereby the convertibility of one resource depends on the availability of others (Bakker & Demerouti, 2017; Hobfoll et al., 2018).

The more consequential finding is the reversal at low thriving, where positive digital engagement was associated with elevated rather than reduced stress. At low thriving, depleted teachers appear to experience digital engagement as an added demand rather than a resource, consistent with the resources-as-demands logic (Bakker & de Vries, 2021). Kindergarten teachers are especially exposed, because parent-facing platforms create near-constant after-hours messaging expectations (Liu et al., 2024; Keleynikov et al., 2022). For teachers already low in energy, maintaining a responsive online presence may accelerate rather than offset emotional exhaustion (Hall-Kenyon et al., 2014). This helps explain why the buffering effect did not merely weaken but reversed, and cautions against one-size-fits-all digital-engagement mandates in early childhood settings.

Contextual insights from the urban–rural comparison

The urban–rural comparison revealed a dual asymmetry. The digital flourishing × thriving synergy was stronger in rural teachers while the direct thriving → resilience

path was stronger in urban teachers. Three mechanisms explain this rural amplification. First, the scarcity of offline professional support raises the marginal value of any additional support channel (Guo & Wan, 2022). Second, digital platforms occupy a larger share of rural teachers' professional ecology, carrying communication and peer support through WeChat and DingTalk (Liu et al., 2024). Third, structural shortfalls in funding, staffing, and materials heighten the salience of internal psychological resources.

In China, rural kindergartens face persistent shortfalls in funding, qualified staff, and in-service training relative to urban counterparts (Guo & Wan, 2022; Hu et al., 2017). Under these constraints, internal psychological resources carry greater weight, so any resource that augments them yields proportionally larger returns, consistent with COR's principle that resources matter most where scarcest (Hobfoll et al., 2018). Digital platforms also fill a larger share of rural teachers' professional communication, magnifying the psychological consequences of how those platforms are experienced (Liu et al., 2024). These conditions plausibly explain why the thriving amplification effect was stronger for rural Chinese kindergarten teachers. The stronger urban direct path likely reflects greater access to non-digital pathways such as structured mentoring and supervisor coaching (Cheng & Lam, 2021). These patterns favor a digital-compensation interpretation over a digital-amplification one (Van Deursen & Helsper, 2015): digital experiences may equalize well-being resources, provided thriving is in place.

Implications for theory and practice

This study makes three theoretical contributions. First, it positions digital flourishing as a contextual JD-R resource, moving beyond the technostress paradigm. Second, it identifies psychological resilience as the COR-anchored mechanism through which digital flourishing buffers stress. Third, it establishes thriving at work as an asymmetric boundary condition, with a reversal at low thriving.

The present findings offer several practical implications for managing early childhood educators' digital well-being. Rather than relying on general awareness, effective intervention requires concrete organizational support. At the school level, kindergarten administrators should establish explicit digital boundaries for staff. For instance, defining acceptable hours for online parent-teacher communication protects teachers' right to disconnect and allows for psychological recovery after hours (Becker et al., 2021). Additionally, school leaders could integrate routine peer-recognition practices into daily management to help mitigate the ongoing depletion of teachers' psychological resources.

Beyond individual kindergartens, educational supervisors and policymakers must focus on minimizing unnecessary digital burdens. Supervisors can conduct periodic audits of administrative workloads to identify and redistribute redundant, non-instructional digital tasks (Bakker & Demerouti, 2017). They can also facilitate local peer-support networks, allowing teachers of similar grade levels to share effective coping strategies (Richards et al., 2016). Finally, our observation that insufficient support exacerbates the stress of digital demands highlights the

need for a cautious approach to technological integration. Before rolling out new digital platforms, policymakers should assess school readiness to ensure that adequate organizational resources are in place. Such steps are essential to foster a work environment that sustains, rather than depletes, teachers' thriving at work.

Strengths, limitations and future research directions

Several limitations should be noted. First, the cross-sectional design precludes causal inferences; longitudinal panel designs or experience-sampling methods would better test reciprocal relationships. Second, the focus on individual-level resources leaves organizational influences uncovered; future work should use multilevel modeling to examine cross-level moderators such as perceived organizational support. Third, reliance on self-report may obscure micro-processes; qualitative approaches such as daily diaries could illuminate how digital engagement is converted into resilience. Fourth, although the sample is geographically diverse within China, cross-cultural replications are needed. Finally, the 41-item occupational stress instrument may have introduced response fatigue, and an abridged kindergarten-specific version would be a useful future development.

Conclusion

This study examined digital flourishing, occupational stress, psychological resilience, and thriving at work among Chinese kindergarten teachers through a moderated mediation framework. The results indicated that digital flourishing was negatively associated with occupational stress, with psychological resilience partially mediating this relationship. Thriving at work moderated the effect of digital flourishing on psychological resilience, such that the positive effect was stronger when thriving was high. Thriving at work further moderated the direct relationship between digital flourishing and occupational stress, with the stress-buffering effect substantially amplified at high thriving levels and attenuated at low levels. Multi-group analyses confirmed the robustness of the overall model across urban and rural teacher groups. These findings extend the application of COR theory and the JD-R model to teachers' digital work contexts and underscore the importance of both positive digital experiences and workplace vitality in mitigating occupational stress among early childhood educators.

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References

- Bakker, A. B., & de Vries, J. D. (2021). Job demands-resources theory and self-regulation: New explanations and remedies for job burnout. *Anxiety, Stress, & Coping*, 34(1), 1–21. <https://doi.org/10.1080/10615806.2020.1797695>
- Bakker, A. B., & Demerouti, E. (2007). The job demands-resources model: State of the art. *Journal of Managerial Psychology*, 22(3), 309–328. <https://doi.org/10.1108/02683940710733115>
- Bakker, A. B., & Demerouti, E. (2017). Job demands-resources theory: Taking stock and looking forward. *Journal of Occupational Health Psychology*, 22(3), 273–285. <https://doi.org/10.1037/ocp0000056>
- Bandura, A. (1997). *Self-Efficacy: The Exercise of Control*. New York, NY, USA: W. H. Freeman.
- Becker, W. J., Belkin, L. Y., Conroy, S. A., & Tuskey, S. (2021). Killing me softly: Organizational e-mail monitoring expectations' impact on employee and significant other well-being. *Journal of Management*, 47(4), 1024–1052. <https://doi.org/10.1177/0149206319890655>
- Bon, A. T., & Shire, A. M. (2022). Review of conservation of resources theory in job demands and resources model. *International Journal of Global Optimization and its Application*, 1(4), 236–248. <https://doi.org/10.56225/ijgoia.v1i4.42>
- Boyle, G. J., Borg, M. G., Falzon, J. M., & Baglioni, A. J. (1995). A structural model of the dimensions of teacher stress. *British Journal of Educational Psychology*, 65(1), 49–67. <https://doi.org/10.1111/j.2044-8279.1995.tb01130.x>
- Cheng, L., & Lam, C. Y. (2021). The worst is yet to come: The psychological impact of COVID-19 on Hong Kong music teachers. *Music Education Research*, 23(2), 211–224. <https://doi.org/10.1080/14613808.2021.1906215>
- Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, 9(2), 233–255. https://doi.org/10.1207/S15328007SEM0902_5
- Cumming, T. (2017). Early childhood educators' well-being: An updated review of the literature. *Early Childhood Education Journal*, 45(5), 583–593. <https://doi.org/10.1007/s10643-016-0818-6>
- Dong, Y., Xu, C., Chai, C. S., & Zhai, X. (2020). Exploring the structural relationship among teachers' technostress, technological pedagogical content knowledge (TPACK), computer self-efficacy, and school support. *The Asia-Pacific Education Researcher*, 29(2), 147–157. <https://doi.org/10.1007/s40299-019-00461-5>
- Granziera, H., Collie, R. J., & Martin, A. (2021). Understanding teacher wellbeing through job demands-resources theory. In: Mansfield, C. F. (Ed.), *Cultivating teacher resilience* (pp. 229–244). Berlin/Heidelberg, Germany: Springer. https://doi.org/10.1007/978-981-15-5963-1_14
- Guo, C., & Wan, B. (2022). The digital divide in online learning in China during the COVID-19 pandemic. *Technology in Society*, 71(1), 102122. <https://doi.org/10.1016/j.techsoc.2022.102122>
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis* (7th ed.). Upper Saddle River, NJ, USA: Prentice Hall.
- Hall-Kenyon, K. M., Bullough, R. V., MacKay, K. L., & Marshall, E. E. (2014). Preschool teacher well-being: A review of the literature. *Early Childhood Education Journal*, 42(3), 153–162. <https://doi.org/10.1007/s10643-013-0595-4>
- Hayes, A. F. (2018). *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach*. (2nd ed.). New York, NY, USA: Guilford Press.
- Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, 44(3), 513–524. <https://doi.org/10.1037/0003-066X.44.3.513>
- Hobfoll, S. E. (2011). Conservation of resources theory: Its implications for stress, health, and resilience. In: Folkman, S. (Ed.), *The Oxford handbook of stress, health, and coping* (pp. 127–147). New York, NY, USA: Oxford University Press.
- Hobfoll, S. E., Halbesleben, J., Neveu, J.-P., & Westman, M. (2018). Conservation of resources in the organizational context: The reality of resources and their consequences. *Annual Review of Organizational Psychology and Organizational Behavior*, 5(1), 103–128. <https://doi.org/10.1146/annurev-orgpsych-032117-104640>
- Hu, B. Y., Fan, X., Wu, Y., & Yang, N. (2017). Are structural quality indicators associated with preschool process quality in China? An exploration of threshold effects. *Early Childhood Research Quarterly*, 40(3), 163–173. <https://doi.org/10.1016/j.ecresq.2017.03.006>
- Hu, T., Zhang, D., & Wang, J. (2015). A meta-analysis of trait resilience and mental health. *Personality and Individual Differences*, 76, 18–27. <https://doi.org/10.1016/j.paid.2014.11.039>
- Janicke-Bowles, S. H., Buckley, T. M., Rey, R., Wozniak, T., Meier, A., et al. (2023). Digital flourishing: Conceptualizing and assessing positive perceptions of mediated social interactions. *Journal of Happiness Studies*, 24(3), 1013–1035. <https://doi.org/10.1007/s10902-023-00621-w>
- Jeon, L., Buettner, C. K., Grant, A. A., & Lang, S. N. (2018). Early childhood teachers' stress and children's social, emotional, and behavioral functioning. *Journal of Applied Developmental Psychology*, 61(6), 21–32. <https://doi.org/10.1016/j.appdev.2018.02.002>
- Keleynikov, M., Benatov, J., & Berger, R. (2022). Preschool teachers' psychological distress and work engagement during COVID-19 outbreak: The protective role of mindfulness and emotion regulation. *International Journal of Environmental Research and Public Health*, 19(5), 2645. <https://doi.org/10.3390/ijerph19052645>
- Kyriacou, C. (1987). Teacher stress and burnout: An international review. *Educational Research*, 29(2), 146–152. <https://doi.org/10.1080/0013188870290207>
- Lesener, T., Gusy, B., & Wolter, C. (2019). The job demands-resources model: A meta-analytic review of longitudinal studies. *Work & Stress*, 33(1), 76–103. <https://doi.org/10.1080/02678373.2018.1529065>

- Liu, J., Li, H., Zhang, X., Wang, Y., & Chen, J. (2024). Preschool teachers' beliefs about, and practices of, online teaching during the COVID-19 pandemic: The role of psychological distress and professional identity. *Early Childhood Education Journal*. <https://doi.org/10.1007/s10643-024-01234-5>.
- Luthans, F., & Youssef-Morgan, C. M. (2017). Psychological capital: An evidence-based positive approach. *Annual Review of Organizational Psychology and Organizational Behavior*, 4, 339–366. <https://doi.org/10.1146/annurev-orgpsych-032516-113324>.
- Masten, A. S. (2001). Ordinary magic: Resilience processes in development. *American Psychologist*, 56(3), 227–238. <https://doi.org/10.1037/0003-066X.56.3.227>
- Pakarinen, E., Kiuru, N., Lerkkanen, M. K., Poikkeus, A. M., Siekkinen, M., et al. (2010). Classroom organization and teacher stress predict learning motivation in kindergarten children. *European Journal of Psychology of Education*, 25(3), 281–300. <https://doi.org/10.1007/s10212-010-0025-6>
- Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879–903. <https://doi.org/10.1037/0021-9010.88.5.879>
- Porath, C., Spreitzer, G. M., Gibson, C., & Garnett, F. G. (2012). Thriving at work: Toward its measurement, construct validation, and theoretical refinement. *Journal of Organizational Behavior*, 33(2), 250–275. <https://doi.org/10.1002/job.756>
- Priyadharshini, E., & Robinson-Pant, A. (2003). The attractions of teaching: An investigation into why people change careers to teach. *Journal of Education For Teaching*, 29(2), 95–112. <https://doi.org/10.1080/02607470320000116112>.
- Richards, K. A. R., Levesque-Bristol, C., Templin, T. J., & Graber, K. C. (2016). The impact of resilience on role stressors and burnout in elementary and secondary teachers. *Social Psychology of Education*, 19(3), 511–536. <https://doi.org/10.1007/s11218-016-9346-x>
- Rosić, J., Janicke-Bowles, S. H., Carbone, L., Lobe, B., & Vandenbosch, L. (2022). Positive digital communication among youth: The development and validation of the digital flourishing scale for adolescents. *Frontiers in Digital Health*, 4, 975557. <https://doi.org/10.3389/fgdth.2022.975557>
- Santiago-Torner, C., Tarrats-Pons, E., & Corral-Marfil, J.-A. (2025). Digital burnout and the future of human sustainability at work: A critical reflection from organizational development (2015–2025). *Organization Development Journal*, 43(3), 108–119.
- Southwick, S. M., & Charney, D. S. (2012). The science of resilience: Implications for the prevention and treatment of depression. *Science*, 338(6103), 79–82. <https://doi.org/10.1126/science.1222942>
- Tugade, M. M., & Fredrickson, B. L. (2004). Resilient individuals use positive emotions to bounce back from negative emotional experiences. *Journal of Personality and Social Psychology*, 86(2), 320–333. <https://doi.org/10.1037/0022-3514.86.2.320>
- Van Deursen, A. J. A. M., & Helsper, E. J. (2015). The third-level digital divide: Who benefits most from being online? *Communication and Information Technologies Annual*, 10(2), 29–52. <https://doi.org/10.1108/S2050-206020150000010002>
- Wang, X., & Yu, G. (2025). Reliability and measurement invariance of the digital flourishing scale among Chinese college students. *Chinese Journal of Clinical Psychology*, 33(1), 135–139. (In Chinese). <https://doi.org/10.1186/s40359-026-04546-x>.
- Whitaker, R. C., Dearth-Wesley, T., & Gooze, R. A. (2015). Workplace stress and the quality of teacher-children relationships in Head Start. *Early Childhood Research Quarterly*, 30(1), 57–69. <https://doi.org/10.1016/j.ecresq.2014.08.003>
- Yao, L. X. (2005). *Teacher Stress Management*. Hangzhou, China: Zhejiang University Press. (In Chinese).
- Yu, X. N., & Zhang, J. X. (2007). A comparison between the Chinese version of ego-resiliency scale and Connor-Davidson resilience scale. *Psychological Science*, 30(5), 1169–1171.
- Zhu, C. S., Shen, J. L., & Liu, J. X. (2002). A study on sources of occupational stress of primary and secondary school teachers. *Modern Primary and Secondary Education*, 3, 50–54. (In Chinese).
- Zhu, J., Wang, L., & Chen, Y. (2023). Navigating technostress in primary schools: Teacher experiences, school support, and health. *Frontiers in Psychology*, 14, 1267767. <https://doi.org/10.3389/fpsyg.2023.1267767>