

Building Bridges from Teacher Resilience to Digital Play Support Competence: The Mediating Role of Organizational Culture in Early Childhood Education

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Abstract

This study explores how teacher resilience and organizational culture jointly shape early childhood teachers' digital play support competence. Using data from 206 teachers in South Korea, structural equation modeling (SEM) was employed to examine the mediating role of organizational culture. Results showed that in group and developmental cultures, organizational culture partially mediated the relationship between teacher resilience and digital play support competence. However, under hierarchical and rational cultures, this mediation was nonsignificant, and resilience directly predicted competence. These findings highlight that resilient teachers thrive in supportive, trust-based organizational environments that foster innovation and emotional sustainability. The study extends the concept of teacher resilience by integrating organizational perspectives, underscoring the importance of creating psychologically safe, collaborative cultures that enhance teachers' adaptive competence in supporting digital play within early childhood education.

Keywords: *Teacher Resilience, Organizational Culture, Digital Play Support Competence, Early Childhood Education*

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Introduction

The rapid pace of social and technological change is reshaping early childhood education worldwide. The COVID-19 pandemic accelerated digital transformation, requiring educators to integrate technology while preserving developmentally appropriate, play-based pedagogy (OECD, 2021). In South Korea, this challenge has become more pronounced as recent policy reforms emphasize both child-centered creativity and digital literacy. These policy expectations place early childhood teachers in a complex professional position: they are expected to incorporate digital tools into practice without reducing play, interaction, and child-centered learning to technology-driven activities. Prior research similarly suggests that digital technologies in early childhood settings should not be understood simply as tools to be adopted, but as pedagogical resources that must be meaningfully integrated into children's play, relationships, and learning experiences (Chu et al., 2024; Edwards, 2013; Plowman et al., 2010). When viewed in this way, digital transformation becomes not only a technical and pedagogical challenge related to teachers' digital competence (Redecker, 2017), but also an emotional and adaptive one, requiring teachers to tolerate uncertainty, experiment with unfamiliar tools, and reinterpret disruption as an opportunity for pedagogical renewal. In this context, teacher resilience becomes a critical professional resource that enables educators to navigate changing expectations constructively, sustain innovation, and maintain professional well-being (Gu & Day, 2013; Mansfield et al., 2016). Yet whether and how this individual capacity is translated into pedagogical practice is shaped by the organizational environment in which teachers work. This perspective directs attention to the interrelationships among teacher resilience, organizational culture, and teachers' competence in supporting young children's digital play. Accordingly, the present study examines the relationships among these three constructs among early childhood teachers in South Korea, with particular attention to the mediating role of perceived organizational culture.

Resilience, in contemporary educational research, is conceptualized not as an innate trait but as a dynamic, relational process that evolves through the interplay of personal, social, and institutional conditions (Beltman et al., 2011). It enables teachers to adapt constructively to adversity, maintain moral purpose, and persist in their professional growth. Teacher resilience encompasses emotional regulation, professional commitment, and a sense of

efficacy that help sustain motivation and engagement under challenging conditions (Day & Gu, 2013). Brunetti (2006) highlighted that teachers' enduring commitment develops through trust, collaboration, and a strong sense of purpose. Similarly, Gu and Day (2013) emphasized that resilience is nurtured within supportive institutional cultures, often described as "resilient schools," where collegial trust and mutual efficacy are embedded in everyday practice. Recent studies further view teacher resilience as a multidimensional capability shaped by personal strengths, professional relationships, and organizational climates, allowing educators to remain agentic and innovative in times of change (Collie & Martin, 2017).

Organizational culture, defined as the network of shared beliefs, values, and behavioral norms shaping institutional life (Hoy & Miskel, 2013; Schein, 2010), plays a pivotal role in teachers' adaptation and engagement. In early childhood education, where teaching is deeply relational, such cultural dynamics play a particularly critical role in shaping collaboration and innovation among teachers. Empirical evidence shows that open, collaborative cultures enhance teachers' motivation, creativity, and sense of belonging (Collie et al., 2012; Thoonen et al., 2011). Conversely, hierarchical or risk-averse environments often stifle innovation and erode professional trust (Stoll & Fink, 1996). In this context, organizational culture serves as a meso-level link between individual and institutional dynamics, mediating how teachers' psychological resilience translates into adaptive teaching behavior. The mechanism of this mediation is relational and resource-based: supportive cultures supply the psychological safety, collegial trust, and shared norms that allow teachers to externalize their internal adaptive capacity as enacted, innovative practice (Edmondson, 1999; Vangrieken et al., 2015). When teachers feel safe to take pedagogical risks and are backed by collaborative routines, resilience is more readily converted into competence; conversely, when the cultural context is controlling or risk-averse, the same internal resilience may remain latent and fail to translate into observable digital pedagogical behavior. Organizational culture thus operates not merely as a backdrop but as the enabling—or constraining—condition through which resilience becomes professional competence.

Building on the Competing Values Framework (CVF), originally proposed by Quinn and Rohrbaugh (1983) and refined by Denison and Spreitzer (1991), organizational culture can be conceptualized along two intersecting dimensions—flexibility versus control and internal versus external focus. The intersection of these dimensions yields four distinct culture types,

which the present study treats as independent constructs rather than as merged pairs. Group culture (internal focus, flexibility) emphasizes cohesion, participation, and collegial trust, operating much like an extended family in which shared decision-making and mutual support are central (Quinn & McGrath, 1985). Developmental culture (external focus, flexibility) prioritizes innovation, creativity, and risk-taking, encouraging members to experiment, adapt, and pursue new practices in response to change (Denison & Spreitzer, 1991). Hierarchical culture (internal focus, control) values formal rules, procedures, and stability, securing predictability and coordination through clearly defined roles and centralized authority (Quinn & McGrath, 1985). Rational culture (external focus, control) is oriented toward goal attainment, productivity, and efficiency, emphasizing measurable performance, task accomplishment, and competitive results (Hartnell et al., 2011).

Although each culture type is treated as an independent construct in this study, their positions along the flexibility–control dimension provide a useful lens for interpreting how they may differentially relate to teacher resilience and digital play support competence. Group and developmental cultures, while differing in their internal versus external orientation, both share the flexibility pole and are therefore expected to foster the collaboration, openness, and experimentation conducive to creative and digital pedagogical practice in early childhood settings. Hierarchical and rational cultures, by contrast, share the control pole, though through different means: hierarchical culture constrains innovation through rule-bound formalization, whereas rational culture does so through performance pressure and an efficiency-driven emphasis on predefined goals. In both cases, the latitude for the exploratory, child-led experimentation that digital play requires is comparatively limited—a conceptual basis for anticipating weaker links with teacher resilience and digital play support competence, and for interpreting these cultures as relatively constraining environments in the analyses that follow. Recent evidence indicates that cultures emphasizing flexibility and external orientation are more conducive to adaptation and innovation during digital transformation (Cao et al., 2025; Gong et al., 2022). Accordingly, examining how these four distinct cultural orientations differentially mediate the relationship between teachers’ resilience and digital play support competence offers critical insight into how institutions can balance innovation with structural coherence.

In the context of digital transformation, organizational culture also shapes how educators

perceive and enact innovation (Cao et al., 2025). Recent studies in early childhood settings indicate that collaborative, learning-oriented cultures encourage teachers to experiment with digital media and engage in reflective digital practices (Arnott, 2019; Edwards, 2019). This aligns with the OECD Learning Compass 2030, which frames individual and collective well-being and innovation as outcomes of culturally supportive and trust-based institutional environments (OECD, 2019). This perspective is extended in the more recent OECD Teaching Compass (OECD, 2025b), which positions teaching competence as emerging from the dynamic interaction of teacher well-being, professional competence, and enabling organizational environments, and which explicitly identifies resilience as a core professional value. This framing is directly pertinent to the present study, as it situates digital play support competence not as an isolated technical skill but as a capacity cultivated through supportive institutional conditions—precisely the mediating pathway examined here. Simultaneously, digital transformation demands new competencies. In early childhood education, digital play support competence refers to the ability to integrate interactive technologies into children’s imaginative, exploratory play (Edwards, 2013; Stephen & Edwards, 2017). Consistent with recent OECD discussions, digital technologies and AI are best understood not as replacements for teachers but as supportive tools that augment professional practice, leaving pedagogical judgment and relational engagement in teachers’ hands (OECD, 2025b). This competence combines pedagogical discernment with emotional adaptability—a form of adaptive expertise developed in relational school cultures. Studies show that resilient teachers are more willing to experiment with digital tools, reinterpret challenges as learning opportunities, and model creative digital engagement for children (Chu et al., 2024; Edwards, 2013; Plowman et al., 2010).

Taken together, these literatures point to a coherent yet largely untested theoretical bridge linking the three constructs: teacher resilience as an individual-level adaptive capacity, organizational culture as the meso-level relational context that enables or constrains its enactment, and digital play support competence as the resulting professional behavior. Viewed through a social-ecological and relational lens (Beltman et al., 2011; Gu & Day, 2013), resilience is realized not in isolation but through the cultural conditions in which teachers work. Nonetheless, research integrating these three constructs—teacher resilience, organizational culture, and digital play support competence—remains limited. Previous

scholarship tends to analyze them separately or qualitatively. Quantitative studies employing structural equation modeling (SEM) are rare, particularly in early childhood contexts where organizational factors have substantial influence on professional behavior. The present study addresses this gap by positioning organizational culture as the theoretical and empirical mechanism that links teacher resilience to digital play support competence.

Purpose and Research Questions

Grounded in relational and organizational perspectives, this study seeks to examine how teacher resilience and perceived organizational culture jointly shape teachers' digital play support competence in early childhood settings. The study's theoretical contribution lies in extending resilience theory into the digital pedagogical domain, highlighting organizational culture as both contextual support and structural mediator. Practically, the findings are expected to inform leadership practices, professional learning design, and policy frameworks aimed at nurturing innovation and well-being among educators.

RQ1. What are the relationships among teacher resilience, perceived organizational culture, and digital play support competence?

RQ2. Does perceived organizational culture mediate the relationship between teacher resilience and digital play support competence?

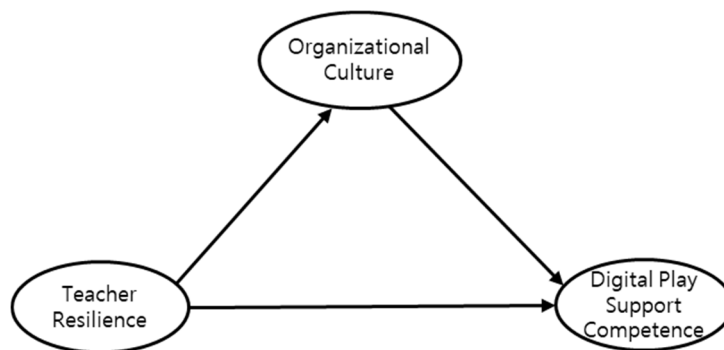


Figure 1. Hypothesized structural model.

Method

Participants

The participants were 206 early childhood teachers working in kindergartens and childcare centers located in two regions of South Korea: the Seoul metropolitan area (Seoul and Gyeonggi) and the Busan-Gyeongnam region (Busan and Gyeongnam). All participants were responsible for children aged 3 to 5 years. Data were collected through an online questionnaire administered between June and September 2025. Participation was voluntary, and informed consent was obtained prior to the survey. The sample included teachers with diverse levels of teaching experience and institutional types to ensure representativeness across early childhood education settings. Detailed demographic information of the participants is presented in Table 1.

Table 1. *Demographic Characteristics of the Participants (n = 206)*

Variable	Category	n	%
Age	20s	66	32.0
	30s	75	36.4
	40s	46	22.3
	50s	19	9.2
Type of Institution	Private kindergarten	46	22.3
	National/public kindergarten	28	13.6
	Workplace childcare center	59	28.6
	Public childcare center	48	23.3
	Corporate childcare center	6	2.9
	Private childcare center	18	8.7
	Home-based childcare center	1	0.5
Class Age Group	3-year-olds	67	32.5
	4-year-olds	35	17.0

Teaching Experience	5-year-olds	39	18.9
	Mixed-age	65	31.6
	< 3 years	40	19.4
	3–6 years	45	21.8
	6–9 years	43	20.9
	9–12 years	27	13.1
	≥ 12 years	51	24.8
Educational Background	Four-year university	74	35.9
	Junior college	72	35.0
	Graduate school (enrolled or completed)	43	20.9
	Childcare teacher training institute	9	4.4
	Academic credit bank program	8	3.9

Measures

Teacher Resilience

Teacher resilience was assessed using the Teacher Resilience Scale originally developed by Kwon (2014) for kindergarten teachers and adapted for the present study to fit early childhood teachers. The scale consists of 47 items rated on a Likert-type scale and includes seven subfactors: psychological factors, behavioral factors, cognitive factors, social competence, personal environmental factors, relational environmental factors, and organizational environmental factors. In the present study, the Cronbach's α for the overall scale was .96, and reliability coefficients for each subfactor are presented in Table 2.

Table 2. *Measurement of the Teacher Resilience Scale*

Subfactor	Description / Example item	No. of items	Cronbach's α
Psychological	"I persevere even when things don't go as planned."	8	.78
Behavioral	"I take initiative in my work."	6	.75

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Cognitive	“When problems arise, I tend to solve them rationally.”	8	.86
Social Competence	“I can handle emotional discomfort well through conversation.”	8	.77
Personal Environmental	“I am healthy enough to fulfill my role as a kindergarten teacher.”	5	.72
Relational Environmental	“Even when I face difficulties, spending time with children makes me feel better.”	5	.78
Organizational Environmental	“In our kindergarten’s teacher meetings, diverse opinions and ideas are welcomed.”	7	.87
Total		47	.96

Note. All items were rated on a five-point Likert scale. *Example items were paraphrased from the original Korean items for clarity and illustration*

Organizational Culture

Perceptions of organizational culture were assessed using the instrument developed by Hwang (2016), which was adapted from Jung (2011) based on theoretical frameworks proposed by Quinn and Kimberly (1984), Quinn and McGrath (1985), and Denison and Spreitzer (1991). The scale comprises four subfactors—group culture, developmental culture, hierarchical culture, and rational culture—and the Cronbach's α for the overall scale was .87 in the present study, with reliability coefficients for each subfactor presented in Table 3.

Table 3. *Measurement of the Organizational Culture*

Subfactors	Description / Example item	No. of items	Cronbach's α
Group	“Colleagues try to maintain friendly relationships with one another.”	6	.88
Developmental	“New ideas are encouraged, and creative thinking is valued.”	6	.90
Hierarchical	“Following rules strictly and avoiding mistakes are emphasized rather than seeking new methods.”	6	.85
Rational	“All work is carried out as a means to achieve goals.”	6	.86
Total		24	.87

Note. All items were rated on a five-point Likert scale. *Example items were paraphrased from the original Korean items for clarity and illustration*

Digital Play Support Competence

Teachers' competence in supporting digital play was measured using the Digital Play Support Competence Scale developed by Yoo (2023) for early childhood teachers. This instrument includes 40 items across seven subfactors: digital environment for young children, characteristics of digital play, selection of digital media, use of digital media, child-centered digital play, creation of digital environments, and digital citizenship. In the present study, the Cronbach's α for the overall scale was .97, with reliability coefficients for each subfactor presented in Table 4.

Table 4. *Measurement of the Digital Play Support Competence*

Subfactors	Description / Example item	No. of items	Cronbach's α
Digital Environment	"I try to learn about the digital devices that young children prefer and frequently use in their everyday lives."	3	.78
Play Characteristics	"I understand that digital media can immediately support what is needed in children's play."	5	.89
Media Selection	"I can select digital media that are physically safe for young children (e.g., appropriate sound volume and screen brightness)."	3	.77
Media Use	"I can search for and use necessary materials by exploring new apps, content, and websites."	10	.91
Child-centered Play	"I provide children with enough time to explore the media used in digital play."	9	.92
Environment Creation	"I arrange the play space so that children can play individually or collaboratively depending on the characteristics of the digital media."	4	.85
Digital Citizenship	"I guide children to recognize and distinguish digital content that may be inappropriate or harmful for them."	6	.89
Total		40	.97

Note. All items were rated on a five-point Likert scale. Example items were paraphrased from the original Korean items for clarity and illustration

Procedure and Data Analysis

The online survey link was created using Google Forms and distributed to early childhood teachers through professional networks, early childhood education associations, and in-service training sessions using convenience sampling. Because the link was shared through these open channels, a response rate could not be calculated. All items were required, however, so none of the responses had missing data, and all 206 responses collected between June and September 2025 were kept for analysis. Data were analyzed using SPSS 31.0 and AMOS 31.0. Prior to hypothesis testing, data screening procedures were conducted to examine normality and identify outliers. Descriptive statistics and Cronbach's α coefficients were calculated to examine the distribution and internal consistency of the variables.

Confirmatory factor analysis (CFA) was then performed to assess the construct validity of the measurement model, verifying factor loadings, average variance extracted (AVE), and composite reliability (CR) for each latent variable. Discriminant validity was further confirmed by comparing the square root of AVE values with inter-construct correlations.

Subsequently, structural equation modeling (SEM) was employed to examine the hypothesized relationships among teacher resilience (e.g., psychological, behavioral, and cognitive subfactors), organizational culture (e.g., group and developmental types), and digital play support competence (e.g., digital environment and media selection), including the mediating role of organizational culture. The model fit was evaluated using multiple indices (χ^2/df , CFI, TLI, SRMR, RMSEA), and bootstrapping (5,000 resamples) was conducted to assess the significance of indirect effects.

Results

In this section, the overall tendencies of the main variables, including teacher resilience, organizational culture, and digital play support competence, are first examined, followed by the correlations among these variables. Next, the goodness of fit of the proposed structural model is evaluated to verify the relationships among teacher resilience (emotional adaptability and professional commitment), organizational culture (shared values and norms), and digital play support competence (the ability to integrate digital tools into play-based

learning). Finally, the path coefficients among the variables were analyzed, and the direct, indirect, and total effects were examined to test the mediating role of organizational culture.

Descriptive Statistics and Correlations among Variables

To provide a preliminary understanding of the variables, descriptive statistics and correlation analyses were conducted. As shown in Table 5, teacher resilience, organizational culture, and digital play support competence were all positively and significantly correlated with one another. Among these associations, the strongest correlation was observed between teacher resilience and digital play support competence.

Table 5. *Descriptive statistics and correlations among variables*

Variable	Teacher Resilience	Organizational Culture	Digital Play Support Competence	<i>M</i>	<i>SD</i>
Teacher Resilience	1			183.81	24.70
Organizational Culture	.37***	1		85.44	11.82
Digital Play Support Competence	.46***	.35***	1	157.32	19.93

Note. *** $p < .001$, ** $p < .01$, * $p < .05$, A detailed correlation matrix for all subfactors is provided in Appendix A.

A detailed correlation analysis of subfactors (Appendix A) revealed consistent and meaningful associations across constructs. At the organizational level, both group and developmental cultures showed moderate-to-strong positive correlations with teacher resilience ($r_s = .58$ and $.59$, $ps < .001$), indicating that resilient teachers tend to perceive their workplaces as collaborative and growth-oriented. These two culture types were also positively associated with teachers' digital play support competence ($r_s = .39$ and $.41$, $ps < .001$), suggesting that institutions fostering trust and innovation are more conducive to the effective integration of digital play. In contrast, hierarchical and rational cultures exhibited weak or nonsignificant correlations with both teacher resilience ($r_s = -.08$ and $-.11$, ns) and digital play support competence ($r_s = .09$ and $.04$, ns), indicating that these culture types were

not positively associated with adaptive or innovative teaching behaviors in the present sample.

Among the subdimensions of digital play support competence, media use and child-centered digital play showed the strongest links with group and developmental cultures ($r_s = .36-.37$, $ps < .001$), underscoring that open and participatory organizational climates enhance teachers' confidence and flexibility in implementing digital media for play. Together, these findings highlight the interdependence between individual resilience and organizational culture in shaping teachers' digital play support competence.

Model Fit of the Structural Model

Organizational culture in this study consisted of four subfactors: group, developmental, hierarchical, and rational cultures. Based on theoretical considerations, group and developmental cultures were expected to have positive influences, whereas hierarchical and rational cultures were assumed to have negative influences on teacher resilience and digital play support competence. Accordingly, two separate structural models were tested to examine these differentiated effects. Model fit indices for the two structural models are presented in Table 6.

Table 6. *Model Fit Indices for the Two Structural Models*

Variable	χ^2/df	SRMR	CFI	TLI	RMSEA
Model 1 (Group + Developmental Cultures)	3.09	.06	.93	.91	.10
Model 2 (Hierarchical + Rational Cultures)	2.00	.06	.90	.95	.07

As shown in Table 6, Model 1 (including group and developmental cultures) demonstrated an acceptable overall model fit ($\chi^2/df = 3.09$, $SRMR = .06$, $CFI = .93$, $TLI = .91$, $RMSEA = .10$). This model adequately represented the mediating mechanism in which an organizational culture emphasizing group and developmental cultures links teacher resilience to digital play support competence.

In Model 2 (including hierarchical and rational cultures), the model also demonstrated a satisfactory level of fit ($\chi^2/df = 2.00$, $SRMR = .06$, $CFI = .90$, $TLI = .95$, $RMSEA = .07$).

However, hierarchical and rational cultures did not significantly mediate the relationship between resilience and digital play support competence.

Structural Relationships among Variables

To examine the hypothesized mediating role of organizational culture, structural relationships among teacher resilience, organizational culture, and digital play support competence were tested using structural equation modeling (SEM). As shown in Figure 2, teacher resilience had a significant direct effect on digital play support competence, while organizational culture also exerted a small but significant indirect effect, indicating a partial mediating role of organizational culture in this relationship. By contrast, Figure 3 illustrates Model 2, in which organizational culture did not mediate the relationship between teacher resilience and digital play support competence.

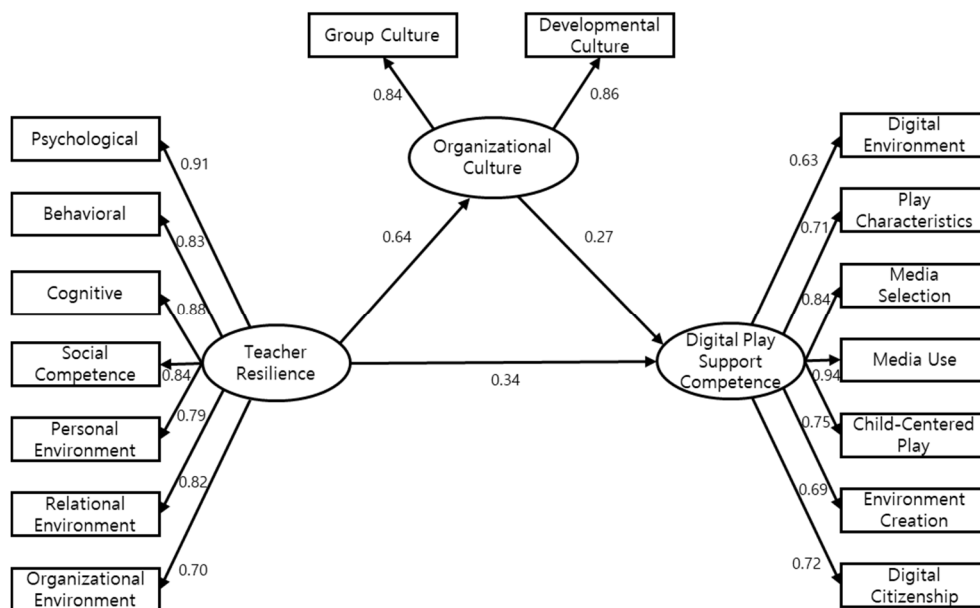


Figure 2. Structural model 1

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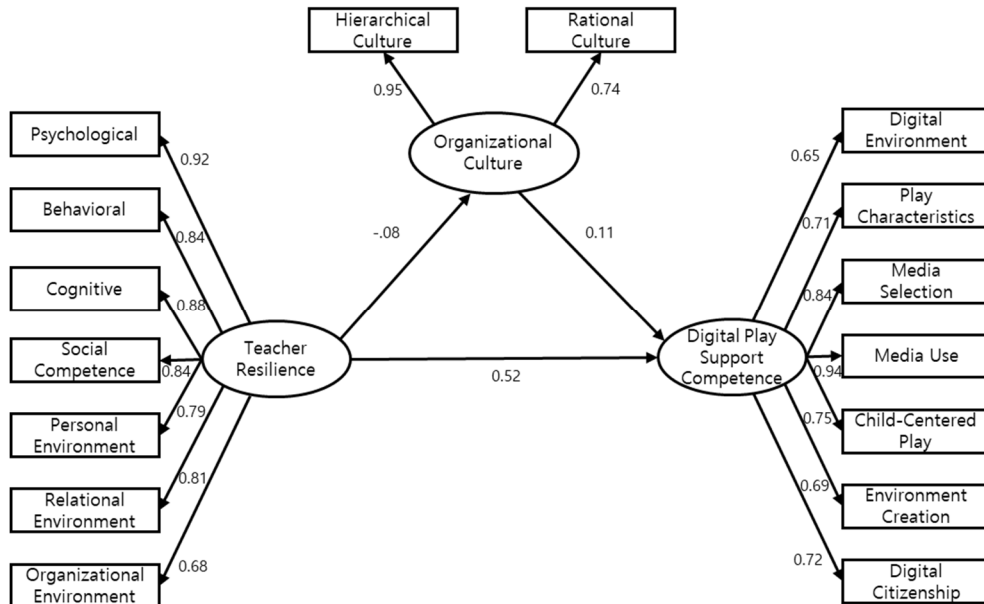


Figure 3. Structural model 2

Figure 2 shows that teacher resilience influenced digital play support competence both directly and indirectly through organizational culture, particularly group and developmental cultures. The indirect path linked teacher resilience to digital play support competence through group and developmental cultures. The figure illustrates a partial mediation, where both personal adaptability and institutional support contribute together to teachers' digital competence.

Figure 3, on the other hand, presents a different pattern. In hierarchical and rational cultures, organizational culture did not play a mediating role, and the path from teacher resilience to digital play support competence remained primarily direct. This indicates that in these control-oriented cultures, which, as conceptualized earlier, prioritize formal rules, stability, and efficiency-driven performance over flexibility and experimentation, teachers' competence depends largely on their own resilience rather than on organizational support. Based on these structural models, the standardized path estimates for Model 1 and Model 2 were examined. The results are summarized in Tables 7 and 8.

Table 7. *Structural relationships for Model 1*

Path	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
Teacher resilience→ Organizational culture	.56	.07	.64	8.55***	< .001
Organizational culture→ Digital Play Support Competence	.09	.03	.27	2.68**	.007
Teacher resilience→ Digital Play Support Competence	.10	.03	.34	3.50***	< .001

Note. *** $p < .001$, ** $p < .01$, * $p < .05$

Table 8. *Structural relationships for Model 2*

Path	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
Teacher resilience→ Organizational culture	-.08	.08	-.08	-1.01	.313
Organizational culture→ Digital Play Support Competence	.03	.02	.11	1.30	.194
Teacher resilience→ Digital Play Support Competence	.16	.02	.52	6.52***	< .001

Note. *** $p < .001$, ** $p < .01$, * $p < .05$

As shown in Table 7 (Model 1), all paths were significant, indicating a partial mediating effect of organizational culture. Teacher resilience positively predicted organizational culture ($\beta = .64, p < .001$), which in turn positively affected digital play support competence ($\beta = .27, p < .01$). The direct effect of teacher resilience on digital play support competence remained significant ($\beta = .34, p < .001$), suggesting that group and developmental cultures partially mediate the relationship between teacher resilience and teachers' competence in supporting digital play.

As shown in Table 8 (Model 2), none of the paths except the direct effect were significant, indicating that organizational culture did not mediate the relationship between teacher resilience and digital play support competence. Teacher resilience had no significant effect on organizational culture ($\beta = -.08, p = .313$), and organizational culture did not significantly influence digital play support competence ($\beta = .11, p = .194$). The direct effect of teacher resilience on digital play support competence remained strong and significant ($\beta = .52, p$

< .001), suggesting that in rational and hierarchical cultures, teachers' competence in supporting digital play primarily depends on individual resilience rather than on organizational factors.

To examine the mediating role of organizational culture, bootstrapping with 5,000 resamples was conducted. The results of the direct, indirect, and total effects are presented in Table 9.

Table 9. *Direct, indirect, total effect*

	Path	Direct effect	Indirect effect	Total effect
Model 1	Teacher resilience → Organizational culture	.64		.64
	Teacher resilience → Digital play support competence	.34	.17*	.51
	Organizational culture → Digital play support competence	.27		.27
Model 2	Teacher resilience → Organizational culture	-.08		-.08
	Teacher resilience → Digital play support competence	.52	-.01	.52
	Organizational culture → Digital play support competence	.11		.11

Note. * $p < .05$

As shown in Table 9, in Model 1, teacher resilience had a significant indirect effect on digital play support competence through organizational culture ($\beta = .17, p < .05$), while the direct effect also remained significant ($\beta = .34, p < .001$). This finding indicates a partial mediating role of organizational culture, suggesting that teachers with higher resilience tend to perceive their organizational culture more positively, which was in turn associated with higher digital play support competence.

In Model 2, however, the indirect effect of teacher resilience on digital play support competence was not significant ($\beta = -.01$). Only the direct effect remained strong and significant ($\beta = .52, p < .001$), implying that under rational and hierarchical cultures, teachers' digital play support competence is primarily influenced by their individual resilience rather than by organizational factors.

Discussion

This study examined how teacher resilience and organizational culture interact to shape digital play support competence in early childhood education. Through correlational and structural equation modeling analyses, clear patterns emerged. In group and developmental cultures, teacher resilience demonstrated both direct and indirect effects on digital play support competence, mediated by organizational culture. In contrast, within hierarchical and rational cultures, the mediating pathway was nonsignificant, while the direct effect of resilience on competence remained strong. These findings underline that resilient teachers are more likely to thrive in collaborative institutional contexts that emphasize trust, creativity, and professional learning. That organizational culture only partially mediated this relationship in Model 1—rather than fully accounting for it—suggests that resilience may relate to digital play support competence through two complementary routes: directly, via teachers' own adaptive capacities, and indirectly, via the supportive conditions that flexible, collaborative cultures provide. In Model 2, the absence of a significant indirect path indicates that control-oriented cultures did not function as a channel through which resilience was expressed; in these settings, competence was associated almost entirely with teachers' individual resilience. The contrast suggests that organizational culture acts as a meaningful mediating resource primarily where the culture is itself flexible and participatory, whereas in control-oriented contexts no such mediating function was evident.

The results are consistent with the notion, expressed by Gu and Day (2013) and Mansfield et al. (2016), that resilience may operate as a relational, context-sensitive capacity rather than solely as a fixed personal trait. Because the present design is cross-sectional and correlational, these patterns should be read as associations consistent with that view rather than as evidence of a developmental process. According to this perspective, resilience evolves through interactions with colleagues, shared professional purpose, and institutional structures that value emotional well-being and participation. Teachers embedded in group and developmental cultures—settings characterized by open communication and shared decision-making—reported higher levels of digital play support competence, particularly in media use and child-centered learning. These findings are consistent with the possibility that resilience supports teachers' creativity and reflective practice amid digital change—a directional claim

that would require longitudinal research to confirm.

Such results are parallel to those reported by Beltman et al. (2011), who argued that resilient teachers flourish when social and organizational supports enable them to balance demands and resources. Similarly, Collie et al. (2012) found that positive school climates, underpinned by collegial trust, enhance teacher motivation and efficacy. The current findings are consistent with the view that resilience and organizational culture are positively associated, though the present data cannot establish the reciprocal causal dynamic this phrasing might imply. When teachers experience emotional safety and relational belonging, their willingness to integrate digital media creatively into play-based environments increases substantially.

In hierarchical and rational cultures emphasizing authority and efficiency, by contrast, organizational culture did not emerge as a significant mediator. It is important to note that this null indirect effect indicates the absence of an organizational channel rather than direct evidence of a harmful one; the present data do not establish that such cultures actively suppress innovative practice. One possible interpretation, consistent with Schein (2010) and Thoonen et al. (2011), is that control-oriented systems may offer fewer of the collaborative supports through which resilience is amplified, such that even resilient teachers might encounter less organizational encouragement for pedagogical risk-taking or digital experimentation. This interpretation remains tentative and warrants direct testing in future research. What the data more securely support is that, where organizational culture did not serve as a mediating resource, digital play support competence rested largely on teachers' individual resilience—suggesting that flexible, participatory cultures may be especially helpful for translating resilience into broader systemic improvement.

At the individual level, the study extends Mansfield et al.'s (2016) conceptualization of *adaptive professionalism*. Resilient teachers demonstrate emotional regulation, cognitive flexibility, and moral purpose that enable them to interpret difficulties as learning opportunities. This aligns with Edwards (2013) and Stephen and Edwards (2017), who argue that teachers' digital competence involves pedagogical sensitivity—the ability to discern when and how to employ digital media meaningfully in children's play. In technologically enriched classrooms, resilience empowers teachers to view uncertainty as creative possibility rather than as a source of stress.

Furthermore, this research adds nuance to contemporary understanding of how organizational culture mediates innovation and well-being. The findings support the assertion that culturally flexible and development-oriented environments transform individual resilience into shared growth. Schools characterized by shared leadership, collegial networks, and reflective inquiry enable teachers to translate adaptability into collaborative digital pedagogy. Collie and Martin (2017) similarly highlighted that autonomy-supportive leadership enhances teacher engagement and psychological functioning. Arnott (2019) also underscored the importance of the broader social and pedagogical context surrounding educators' engagement with digital technology, while collaborative professional communities can reinforce confidence through co-learning and mutual support (Vangrieken et al., 2015).

The results also connect with the OECD's (2023, 2025a) policy perspective that sustainable digital transformation in early childhood education must integrate emotional well-being, collective professionalism, and technological adaptability. Collaborative professionalism, as OECD highlights, is the cornerstone of educational innovation, empowering teachers not just to adapt but to shape digital transformation proactively.

Implications for Practice and Policy

The associations observed here point to several practical considerations, offered as directions rather than as causal prescriptions. At the level of teacher preparation, programs might provide space for constructive experimentation, mentoring, and collective reflection, so that resilience can develop through authentic practice rather than prescriptive training. At the institutional level, support systems that help teachers experience both autonomy and connection—through distributed leadership, shared responsibility, and professional learning communities—may foster a form of organizational resilience that parallels personal resilience. At the policy level, and consistent with the OECD's (2023, 2025a) emphasis on integrating emotional well-being, collective professionalism, and technological adaptability, aligning teacher well-being initiatives with digital-education reforms appears important for sustaining innovation. Across these levels, the present findings are best read as identifying conditions associated with stronger competence rather than as establishing that any single

intervention will produce it.

In sum, this study broadens the understanding of teacher resilience by positioning it as a resource that appears closely linked to, and potentially shaped by, organizational and cultural conditions. Resilient teachers are not merely those who withstand stress but those who utilize institutional trust and collaboration to turn adversity into innovation. These findings affirm that digital pedagogical competence in early childhood settings emerges through the alignment of individual adaptability, collegial relationships, and supportive leadership. Strengthening these interconnections can nurture both teacher well-being and sustained educational improvement.

Ultimately, digital play pedagogy in early childhood education should be viewed as a collaborative ecosystem, where the emotional, organizational, and technological dimensions of resilience interact dynamically. When teachers' internal capacities are amplified by cultures of trust and professional dialogue, they are empowered to experiment, reflect, and innovate. This synergy offers a practical pathway toward the holistic goal of 21st-century education: enabling educators and children alike to thrive creatively within human-centered digital environments.

Limitations and Future Research

Several limitations should be considered when interpreting these findings. First, the cross-sectional design precludes causal inference; although the structural models specify directional paths, the data capture associations at a single time point and cannot establish that resilience or organizational culture produces changes in digital play support competence. Longitudinal or experimental designs are needed to test the directional and mediating relationships proposed here. Second, all variables were assessed through teacher self-report, which may introduce common-method bias and social-desirability effects; future studies could incorporate observational, peer, or administrator ratings of digital play practice. Third, the sample comprised South Korean early childhood teachers within a particular national and policy context, which may limit generalizability; moreover, the grouping of institutions into flexibility- and control-oriented models reflects participants' perceptions of their dominant culture rather than independently verified organizational characteristics. Finally, the partial

and nonsignificant mediation patterns observed across the two models warrant replication with larger and more diverse samples before firm conclusions are drawn about how cultural context conditions the resilience–competence relationship.

Conclusion

This study provides empirical evidence explaining how teacher resilience and organizational culture jointly shape digital play support competence in early childhood education. The results revealed that collaborative and developmental cultures were associated with stronger links between teacher resilience and digital play support competence, whereas in hierarchical and rational cultures this mediating pathway was not evident. These findings reaffirm that resilient teachers achieve educational innovation most sustainably within institutions that embody openness, trust, and shared growth.

Theoretically, this research extends the understanding of teacher resilience by suggesting that teacher resilience is better understood in relation to its organizational and cultural context than as an isolated individual trait. It highlights that emotional adaptability, collegial trust, and technological competence function as interdependent resources that collectively sustain teachers' professional growth in the digital era.

Practically, the study suggests that teacher education programs should integrate resilience-building strategies, emotional support, and digital pedagogy training into a coherent framework that encourages experimentation and reflection. At the institutional level, leaders should cultivate psychologically safe, collaborative school cultures where teachers are empowered to explore, innovate, and share digital teaching practices. At the policy level, aligning teacher well-being initiatives with digital education reforms is essential to ensure that emotional sustainability and technological innovation evolve together. In sum, connecting personal resilience with organizational culture, early childhood education can advance a human-centered model of digital transformation that strengthens both teacher well-being and the quality of learning experiences for young children.

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Building Bridges from Teacher Resilience to Digital Play Support Competence: The Mediating Role of Organizational Culture in Early Childhood Education

Appendix A Detailed correlation matrix for all subfactors

	1psychol ogical factors	2behavio ral factors	3cognitive factors	4social competen ce factors	5personal environm ental factors	6relation al environm ental factors	7organiz ational environm ental factors	8teacher resilience	9digital environm ent for young children	10charac teristics of digital play	11selecti on of digital media	12use of digital media	13child- centered digital play	14creation of digital environm ents	15digital citizenship	16digital play support competen ce	17group culture	18develo pmental culture	19hierarc hical culture	20rational culture	21organi zational culture
1	1																				
2	.79***	1																			
3	.81***	.83***	1																		
4	.76***	.71***	.75***	1																	
5	.76***	.64***	.67***	.75***	1																
6	.75***	.63***	.72***	.68***	.66***	1															
7	.60***	.56***	.63***	.59***	.54***	.74***	1														
8	.91***	.86***	.91***	.87***	.82***	.85***	.79***	1													
9	.36***	.43***	.48***	.35***	.28***	.34***	.28***	.42***	1												
10	.36***	.30***	.40***	.38***	.27***	.39***	.38***	.42***	.60***	1											
11	.42***	.41***	.46***	.44***	.29***	.40***	.34***	.46***	.52***	.63***	1										
12	.34***	.39***	.41***	.40***	.29***	.35***	.31***	.42***	.57***	.61***	.68***	1									
13	.27***	.33***	.37***	.33***	.24***	.29***	.26***	.35***	.56***	.48***	.56***	.71***	1								
14	.18**	.30***	.32***	.32***	.13*	.28***	.27***	.30***	.50***	.50***	.55***	.62***	.75***	1							
15	.28***	.32***	.34***	.33***	.18**	.28***	.30***	.35***	.47***	.52***	.59***	.64***	.61***	.66***	1						
16	.37***	.43***	.47***	.44***	.29***	.40***	.37***	.46***	.71***	.73***	.76***	.89***	.88***	.82***	.80***	1					
17	.44***	.38***	.44***	.49***	.41***	.54***	.71***	.58***	.29***	.39***	.34***	.37***	.30***	.24***	.28***	.39***	1				
18	.47***	.44***	.46***	.43***	.45***	.51***	.74***	.59***	.31***	.30***	.34***	.36***	.36***	.28***	.32***	.41***	.77***	1			
19	-.06	-.03	-.04	-.08	-.02	-.09	-.13*	-.08	.03	-.11	.03	.08	.17**	.15*	.06	.09	-.11	.01	1		
20	-.06	-.01	-.05	-.12*	-.08	-.01	-.20**	-.11	.02	-.14	-.05	.08	.14*	.06	-.06	.04	-.10	-.01	.70***	1	
21	.29***	.29***	.30***	.27***	.29***	.31***	.41***	.37***	.25***	.15*	.25***	.34***	.38***	.28***	.23***	.35***	.58***	.67***	.66***	.65***	1