

Analyzing the relationship between teaching-learning conceptions and curriculum fidelity: The mediating role of motivation to teach

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Abstract

This study aimed to understand the relationship among teachers' conceptions of teaching-learning, their motivation to teach and, curriculum fidelity. The correlational design, consisting of structural equation modeling with mediation analysis, was applied. A total of 424 in-service teachers participating in this study completed three scales, viz. the Conceptions of Teaching and Learning, the Motivation to Teach, and the Curriculum Fidelity. A confirmatory factor analysis was carried out to create a well-fitting measurement model, as well as to ascertain the convergent and discriminant validities and composite reliability. The results indicated that constructivist conception positively related to adaptation, whereas traditional conception was positively correlated to adherence. Constructivist and traditional conceptions both have a positive and significant relationship with both intrinsic and extrinsic motivation. While intrinsic motivation had positive significant relations with adaptation, it had negative significant relations with adherence. Besides that, while extrinsic motivation had positive significant relations with adherence, it had negative significant relations with adaptation. The results of mediation analysis showed that intrinsic and extrinsic motivation both partially mediated the relations between constructivist conception and adaptation, and traditional conception and adherence. Based on the results, the study offers theoretical and practical implications, along with further research directions.

Keywords

Teaching-learning conceptions, Motivation to teach, Curriculum fidelity, Structural equation modeling

1. Introduction

Today's educational leaders place significant emphasis on the curriculum as they aim to design and implement programs that align with students' needs. Their objective is to boost student learning outcomes and achieve higher performance on accountability metrics tailored to their specific contexts (Gordon et al., 2019). Today, as in almost every field, innovations are rapidly taking place in the field of education, and skills have become

more important than mere knowledge in the 21st century, which is called the information and communication age (Gore, 2013; Voogt & Roblin, 2012), and this has changed the expectations from education and this situation has been reflected in the curricula. Many countries are updating their curricula to include the competencies needed in today's conditions in order to improve the quality of education and to meet the needs of the age (Norman & Spohrer, 1996), and the pace of curriculum changes has increased in recent years (Bıkmaz, 2023).

Although countries are trying to revise their curricula in an effort to keep up with the rapid changes, it may not be enough to design curricula solely by taking into account the conditions of the age to achieve the desired success in education. No matter how well a curriculum is prepared, its real effectiveness depends on the teachers who implement it. For many years, teachers have been acknowledged as a vital influence with significant power in academic settings (Derakhshan et al., 2020; Wang, 2017). Additionally, the effective implementation of the curriculum by teachers is considered essential for its success. In other words, teachers are the guarantors of the effectiveness and efficiency of the curriculum (Ryu, 2015).

An innovative and forward-thinking curriculum may be in vain if those who will implement it do not commit to the curriculum (Gordon et al., 2019), and this brings the concept of program commitment to the fore. Curriculum fidelity involves executing the curriculum as designed, ensuring that the educational objectives are met as intended by the developers (Pence et al., 2008). Therefore, it can be said that curriculum fidelity is the realization of the official curriculum within the scope of the operational curriculum (Posner, 2004). Curriculum fidelity also is the degree to which teachers adhere to or adapt the curriculum. Adherence to the curriculum involves following prescribed guidelines and instructional materials closely, ensuring consistency and standardization. This approach is often seen as essential for maintaining the integrity of educational programs and ensuring that all students receive a uniform educational experience (Dane & Schneider, 1998; Dusenbury et al., 2003). High curriculum fidelity can facilitate the accurate assessment of educational programs by providing a clear measure of how closely the implemented curriculum aligns with the intended design. This alignment is crucial for evaluating the effectiveness of curricula and making informed decisions about educational improvements. Adhering to the curriculum can also help educators meet accountability standards and demonstrate compliance with educational policies and mandates (Marsh & Willis, 2007).

However, strict adherence to the curriculum may not always be feasible or desirable due to varying classroom contexts, teacher experiences, and student needs. In practice, many teachers find it necessary to adapt the curriculum to better meet the specific needs of their students and the unique challenges of their teaching environments. Curriculum adaptation allows teachers to modify and tailor the curriculum to foster a more responsive and flexible learning environment (Bümen et al., 2014). Adaptation can involve changes to the content, teaching methods, or assessment strategies to enhance relevance and accessibility for students. This approach recognizes the dynamic nature of teaching and learning, acknowledging that effective education often requires a balance between adhering to established guidelines and making context-specific adjustments (Pence et al., 2008). The tension between curriculum fidelity and adaptation reflects broader debates in educational theory about the roles of standardization and flexibility in effective teaching.

While some argue that strict fidelity is essential for maintaining educational quality and coherence, others contend that adaptation is necessary to address the diverse needs of students and promote meaningful learning experiences (Fullan, 2015; Larsen & Samdal, 2007).

1.1. Factors influencing curriculum fidelity

The factors influencing curriculum fidelity are multifaceted, encompassing teacher-related characteristics, institutional factors, and broader systemic issues. Teacher characteristics, including their educational background, teaching experience, and personal beliefs about education, play a significant role in how they implement curricula. Teachers with higher levels of education and specialized training are more likely to understand the importance of curriculum fidelity and possess the skills to adapt curricula effectively without compromising their core objectives (Wilcox-Herzog et al., 2015). Institutional factors such as administrative support, availability of resources, and professional development opportunities also impact curriculum fidelity. Schools that provide robust support systems, including ongoing training and access to teaching materials, enable teachers to implement curricula more effectively. Additionally, collaborative school cultures that encourage teacher input and innovation can foster a more adaptive approach to curriculum implementation (Bümen et al., 2014). Systemic issues, including standardized testing pressures and centralized education policies, can either support or hinder curriculum fidelity. High-stakes testing environments often push teachers toward strict adherence to prescribed curricula to ensure their students perform well on assessments. Conversely, decentralized education systems that allow for greater teacher autonomy can encourage adaptation and innovation in curriculum implementation (Marsh & Willis, 2007).

In the literature, it is seen that the studies conducted on the factors affecting curriculum fidelity related to teachers are generally the studies that try to determine the relationship between curriculum literacy (Gürbüz & Şen, 2023; Öner-Sunkur & Yılmaz, 2024; Tanaş & Tuncer, 2023; Yılmaz & Kahramanoğlu, 2021), self-efficacy (Çobanoğlu & Çapa-Aydın, 2015; LaChausse et al., 2014), teaching-learning conceptions (Baş & Şentürk, 2019; Çobanoğlu & Çapa-Aydın, 2015), curriculum orientations (Yılmaz & Kahramanoğlu, 2021), curriculum design orientation preferences (Yıldız, 2018) and curriculum fidelity by using correlation or regression analysis. However, in addition to these, teachers' motivation, both intrinsic and extrinsic, can significantly affect their fidelity to the curriculum (Bay et al., 2017). Intrinsic motivation, driven by a passion for teaching and a commitment to student success, is often associated with higher levels of curriculum fidelity. In contrast, extrinsic motivation, influenced by external rewards such as salary or job security, may not sustain long-term commitment to the curriculum (Deci et al., 1991; Ryan & Deci, 2000). Also, teachers' pedagogical beliefs influence how they perceive and implement the curriculum, which in turn can affect their fidelity to it. For instance, teachers who hold constructivist beliefs could be more likely to adapt the curriculum to better meet their students' needs. This adaptation can lead to innovative teaching practices and enhanced student learning outcomes (Charlesworth et al., 1993; Wang et al., 2008).

1.1.1. Motivation to teach

Motivation is the willingness to exert high levels of effort toward a particular goal (Robbins & Judge, 2012). The concept of motivation encompasses various theories and models that explain why individuals engage in specific behaviors. In educational settings, teacher motivation is crucial because it directly affects teaching quality and student outcomes. Self-determination theory is one prominent framework that distinguishes between intrinsic and extrinsic motivation (Ryan & Deci, 2000). Intrinsic motivation refers to engaging in teaching for the inherent satisfaction and fulfillment it brings, driven by personal interest and internal rewards. Intrinsically motivated teachers tend to derive pleasure from the process of teaching itself, finding joy in student interactions, the progression of student learning, and the intellectual stimulation teaching provides. This form of motivation is crucial as it fosters a deeper engagement with the teaching process, leading to innovative and dynamic teaching practices (Deci & Ryan, 2001).

Extrinsic motivation, conversely, is driven by external rewards like salary, job stability, and professional acknowledgment. This type of motivation is apparent when individuals engage in an activity primarily for the desirable outcomes it produces rather than for the activity itself (Ntoumanis & Mallet, 2014). Extrinsically motivated teachers might be driven by the need to meet external standards, gain professional advancement, or secure job stability. While extrinsic motivation can effectively drive performance and goal achievement, it may not sustain long-term engagement or satisfaction in teaching. Both forms of motivation are essential in understanding teachers' commitment and enthusiasm, which subsequently influence their teaching practices and interactions with students (Gredler et al., 2004; Van den Berghe et al., 2014).

1.1.2. Conceptions about teaching and learning

Conceptions about teaching and learning significantly affect how educators approach their instructional duties. These conceptions can be broadly categorized into constructivist and traditional orientations (Alburo, 2019; Deng et al., 2014). Teachers with constructivist beliefs view learning as an active, student-centered process where knowledge is constructed through experience and interaction. Constructivist teachers see their role as facilitators who guide students through discovery and exploration, encouraging them to develop critical thinking and problem-solving skills. This approach is consistent with modern educational theories that highlight the significance of meaningful learning experiences, where students actively participate in constructing their understanding of concepts (Chan & Elliott, 2004; Woolfolk, 2016). Constructivist educators tend to design learning activities that promote collaboration, inquiry, and real-world application. They believe that students learn best when they can relate new information to their existing knowledge and experiences. This belief leads to a teaching style that is flexible and responsive to individual student needs, fostering an atmosphere where students feel authorized to take ownership of their learning (Mayer, 2003).

In contrast, teachers with traditional beliefs perceive learning as a passive absorption of information, where the teacher's role is to transmit knowledge directly to students, who are expected to memorize and reproduce it. Traditional teaching methods often involve structured, teacher-centered activities where the focus is on delivering content efficiently and ensuring that students meet predefined academic standards. This approach is rooted

in behaviorist theories of learning, which emphasize the importance of reinforcement and repetition in acquiring knowledge and skills (Driscoll & Burner, 2022). Traditional educators might prioritize discipline, order, and uniformity in their classrooms, with a strong emphasis on rote learning and standardized testing. They often view their role as the primary source of knowledge, responsible for delivering content clearly and systematically. While this approach can be effective in certain contexts, it may not fully engage students or promote the development of higher-order thinking skills (Chan & Elliott, 2004).

The interplay of these factors highlights the complexity of achieving curriculum fidelity in diverse educational contexts. Understanding how these variables interact is crucial for designing effective educational interventions and policies that support both adherence to curricular standards and necessary adaptations to meet student needs. A structural equation model can be used to analyze the influences of these variables simultaneously and it can provide novel insights into the structural relationships. From this point of view, the current research aims to examine the relationship between teachers' conceptions of teaching-learning and their motivation to teach, which is thought to be related to curriculum fidelity (the extent to which they adhere or adapt rather than their fidelity levels), based on structural equation modeling, which includes mediating variables and will provide more comprehensive and robust results than correlation or regression analysis.

Based on the related literature suggesting that teaching-learning conceptions and motivation to teach potentially impact curriculum fidelity, it is hypothesized that teachers' beliefs about teaching and learning, as well as their motivation to teach, can influence their adherence to the curriculum. The hypothesized model is illustrated in Figure 1. Consequently, this study addresses the following research questions:

- RQ₁: Are there any significant interrelationships between teachers' conceptions about teaching and learning, motivation to teach, and curriculum fidelity?
- RQ₂: Does motivation to teach mediate the relationship between teaching-learning conceptions and curriculum fidelity?

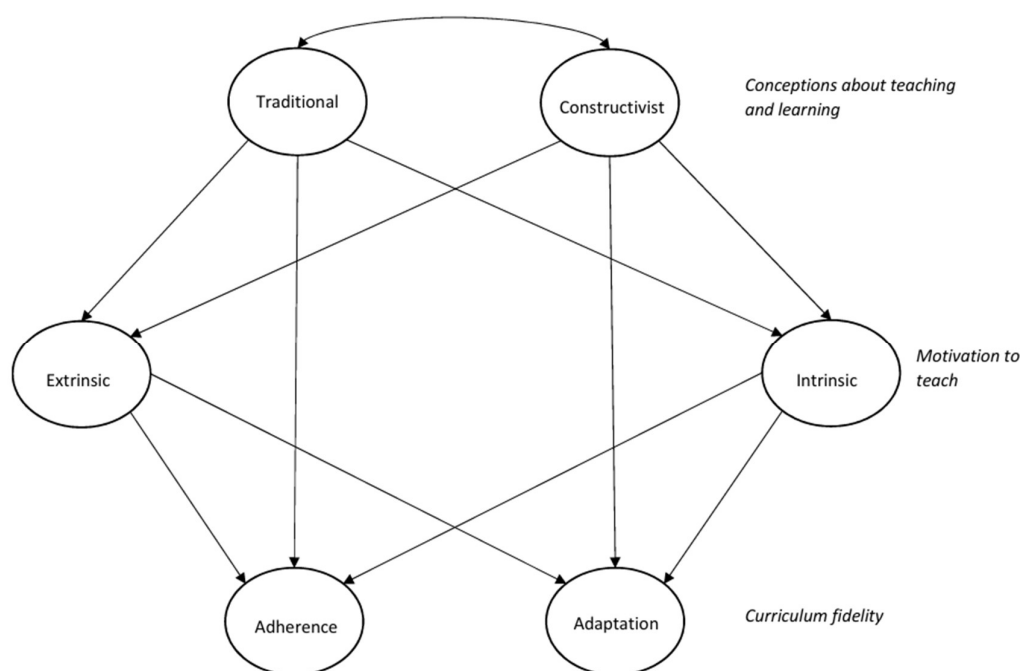


Figure 1. The hypothesized model.

2. Methodology

2.1. Research design

To explore the relationship among teachers' conceptions about teaching and learning, motivation to teach, and curriculum fidelity a quantitative correlational design was employed. The current study hypothesized a model (Figure 1), and tested the hypothesized model through the structural equation modeling (SEM). SEM is a powerful statistical technique that allows researchers to test theoretical models that specify the relationships between observed and latent variables in a simultaneous way (Byrne, 2016; Kline, 2023). It examines the measurement properties of a variable and the interrelationships between multiple variables, often regarded as a blend of regression and factor analysis. Typically, SEM adopts a confirmatory approach, where the researcher proposes a model of relationships between variables of interest and assesses whether the observed data supports the hypothesized directionality and significance of these relationships (Collier, 2020). In the context of this study, through SEM, an attempt was made to elucidate how constructivist and traditional educational beliefs along with, intrinsic and extrinsic motivations, shape teachers' adherence to or adaptation to the prescribed curriculum. The model includes pathways representing hypothesized causal relationships, allowing for the examination of both direct and indirect effects.

2.2. Participants

A total of 424 in-service teachers working in the Hakkari province in southeastern Turkey randomly attended this study. Among the participants, there were 200 females

(47%) and 224 males (53%). There were 32 preschool teachers (8%), 141 primary school teachers (33%), 92 middle school teachers (22%), and 159 high school teachers (37%). Table 1 displays the demographic information of the participants in more detail. Teachers who volunteered to participate in the study were informed that their information would be kept confidential and used exclusively for academic purposes.

Table 1. The demographic information of the teachers.

Variable	Frequency	Percentage	Variable	Frequency	Percentage
<i>Age</i>			<i>Gender</i>		
20-24	15	3.5	Female	200	47.2
25-29	125	29.5	Male	224	52.8
30-34	105	24.8	<i>Major</i>		
35-39	117	27.6	Primary school teacher	103	24.3
40+	62	14.6	Social sciences	66	15.6
<i>Experience</i>			Preschool teacher	38	9.0
0-4 years	153	36.1	Mathematics	36	8.5
5-9 years	114	26.9	Turkish	32	7.5
10-14 years	74	17.5	Vocational courses	32	7.5
15-19 years	51	12.0	Science	30	7.1
20+ years	32	7.5	Special education	30	7.1
<i>Work context</i>			Foreign language	27	6.4
Preschool	32	7.5	Physical education	11	2.6
Primary school	141	33.2	Arts	10	2.3
Middle school	92	21.7	Information technologies	9	2.1
High school	159	37.5			

2.3. Measures

In line with the objectives of the current study, the consequent measures were employed:

The survey used to collect the study data consisted of four sections: (1) teacher profile, (2) motivation to teach, (3) conceptions about teaching and learning, and (4) curriculum fidelity.

Motivation to Teach Scale (MTS), was developed by Kauffman et al. (2011) and adapted into Turkish by Ayık et al. (2015). The scale was used to measure teachers' motivation to teach in terms of intrinsic motivation (seven items, $\alpha = .86$, e.g., "I teach because I believe it will give me a sense of deep personal fulfillment."), and extrinsic motivation (five items, $\alpha = .76$, e.g., "I chose teaching because benefits are good."). This instrument used a 6-point Likert scale, with 1 denoting "strongly disagree" and 6 denoting "strongly agree."

Teaching and Learning Conceptions Scale (TLCS), developed by Chan and Elliot (2004). In this study, instead of the original form of the scale consisting of 30 items, the short form adapted to Turkish by Doruk (2022) was employed. The short form of the scale has 14 items on a 5-point response scale, ranging from 1 (strongly disagree) to 5 (strongly agree), with two components: constructivist conception (seven items, $\alpha = .85$, e.g., "Good

teachers always encourage students to think for answers themselves.”), and traditional conception (seven items, $\alpha = .81$, e.g., “The major role of a teacher is to transmit knowledge to students.”).

Curriculum Fidelity Scale (CFS), developed by Öner-Sunkur and Yilmaz (2024) to measure teachers’ level of curriculum fidelity in two dimensions: adherence (eleven items, $\alpha = .89$, e.g., “I am willing to implement the curriculum in its original form.”), and adaptation (eleven items, $\alpha = .89$, e.g., “I adapt the curriculum to the traditions and customs of the students.”). The teachers who participated in the study rated their level of agreement using a 5-point Likert scale, with 5 indicating 'strongly agree' and 1 indicating 'strongly disagree'.

2.4. Data analysis

Preliminary monitoring of the collected data revealed no missing entries. To verify the factor structure of the observed variables, confirmatory factor analyses (CFAs) were conducted on the three instruments using the Analysis of Moment Structure (AMOS) version 22 with the maximum likelihood estimation approach. Afterward, structural equating modeling (SEM) was run to reveal the causal relationships between teachers’ motivation to teach and curriculum fidelity, and their subcomponents. Mediation analysis evaluated the impacts of two subcomponents of conceptions about teaching and learning in the relationship between motivation to teach and curriculum fidelity. The analysis employed a advised 5000 bootstrap sample to specify the significance level for loadings, weights, and path coefficients (Hair et al., 2019)

3. Results

3.1. Descriptive statistics

Primarily, descriptive statistics and the correlations between the basic variables were checked. As indicated in Table 2, the teachers’ mean scores for MTS, TLCS, and CFS ranged between 3.575 and 4.082. The standard deviations ranged between 0.421 and 0.995, reflecting narrow spreads around the mean scores. The Cronbach alpha (α) coefficients estimated for MTS and CFS were at an ideal level and an acceptable level for TLCS, indicating that internal consistency is sufficient. Finally, The Pearson correlation analysis results showed that MTS positively and significantly correlated with TLCS ($r=0.323$, $p < .01$), and CFS ($r=0.323$, $p < .01$). The correlation between TLCS and CFS also was positive and significant ($r=0.328$, $p < .01$).

Table 2. Descriptive statistics and correlations.

	Mean	SD	α	1	2	3
1 MTS	4.082	.995	.835	1		
2 TLCS	3.575	.421	.659	.323**	1	
3 CFS	3.654	.471	.817	.323**	.328**	1

** $p < .01$

3.2. Confirmatory factor analysis of the MTS, TLCS, and CFS

Confirmatory factor analyses (CFAs) of the three instruments were conducted prior to SEM path analysis. Items with factor loadings above 0.58, the established minimum threshold, were included in the model. Model fit was evaluated using the root mean squared error of approximation (RMSEA), standardized root mean square residual (SRMR), comparative fit index (CFI), goodness of fit index (GFI), and Tucker–Lewis index (TLI). The acceptable range for χ^2/df is between 2 and 5, and for RMSEA and SRMR, it is between 0.05 and 0.08. Additionally, TLI, CFI, and GFI values are considered acceptable within the range of 0.90 to 0.95 (Browne & Cudeck, 1992; Byrne, 2016; Hu & Bentler, 1999; Xia & Yang 2019). As seen in Table 3, the CFA model fits for MTS, TLCS, and CFS were acceptable.

Table 3. Model fit indices for CFA models.

	X ² /df	GFI	CFI	TLI	SRMR	RMSEA	p
MTS	3.80	.97	.96	.94	.04	.08	<.001
TLCS	2.25	.96	.97	.96	.05	.05	<.001
CFS	3.73	.90	.92	.90	.06	.08	<.001

The CFA results also revealed that the indicators' correlations with their proposed latent components ranged from 0.34 to 0.72, indicating medium to large effect sizes (Cohen et al., 2018). The standardized coefficients (β) ranged from 0.58 to 0.85, all of which were statistically significant at $p < .001$. The critical ratios (C.R.) varied between 7.39 and 15.90. Furthermore, both the composite reliability (CR) and average variance extracted (AVE) were used to assess internal consistency reliability and convergent validity. According to Hair et al. (2019), a CR value of 0.60 and an AVE value of 0.50 or above are considered adequate. Additionally, a standardized estimate greater than 0.50 sufficiently explains its latent variable. The results indicated that the CR, AVE, and standardized estimates met the required criteria (Table 4).

Table 4. Results generated from CFA.

	Domains	R ²	β	C.R.	p	AVE	CR
MTS	Extrinsic	.48-.53	.69-.73	7.39-7.39	<.001	.52	.68
	Intrinsic	.36-.58	.60-.76	10.98-14.85	<.001	.50	.85
TLCS	Constructivist	.43-.59	.66-.77	12.00-13.84	<.001	.52	.88
	Traditional	.35-.72	.59-.85	10.22-13.29	<.001	.52	.84
CFS	Adherence	.38-.66	.61-.81	11.99-15.90	<.001	.50	.86
	Adaptation	.34-.58	.58-.76	11.49-13.06	<.001	.50	.92

3.3. Findings from SEM analysis

To examine the path correlations among teaching-learning conceptions, motivation to teach, and curriculum fidelity, path analysis was conducted using SEM. The SEM results, shown in Figure 2, revealed the structural relationships between the latent

variables. The fit indices of the structural model indicated an acceptable fit ($\chi^2/df = 2.45$, CFI = 0.89, TLI = 0.88, SRMR = 0.08, and RMSEA = 0.06).

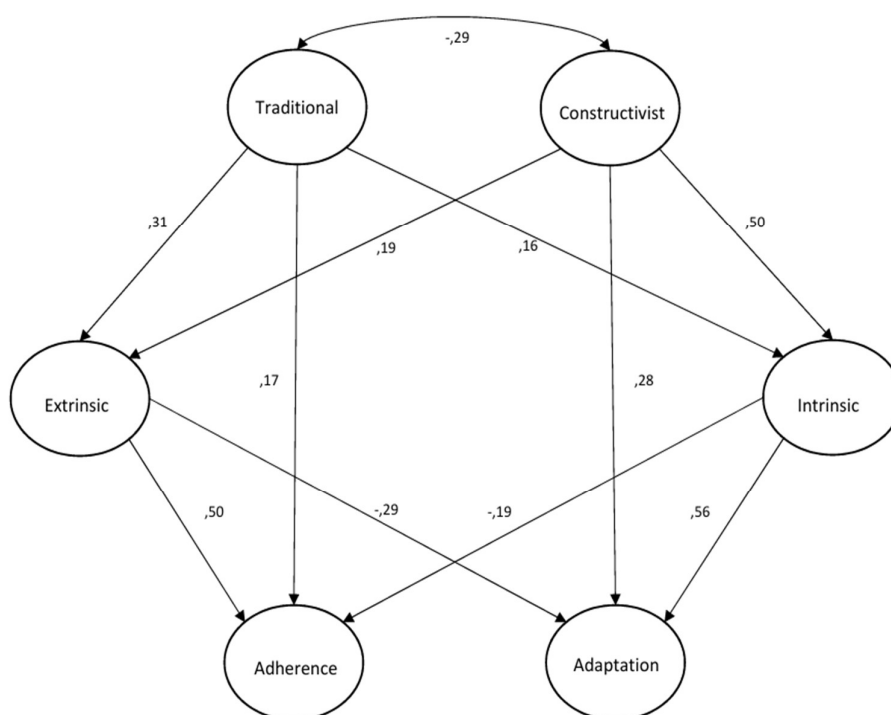


Figure 2. Structural equation modeling of the relations between teachers' teaching-learning conceptions, motivation to teach, and curriculum fidelity.

The results of the path analysis are presented in Table 5. The constructivist conception had significant positive relations with intrinsic motivation, extrinsic motivation, and adaptation ($\beta=0.50$, 0.19 , and 0.28 respectively, $p<0.01$). The traditional conception also had significant positive relations with intrinsic motivation, extrinsic motivation, and adherence ($\beta=0.16$, 0.31 , and 0.17 respectively, $p<0.01$). In addition, while intrinsic motivation had positive significant relations with adaptation ($\beta=0.56$, $p<0.01$), it had negative significant relations with adherence ($\beta=-0.19$, $p<0.01$). Besides that, while extrinsic motivation had positive significant relations with adherence ($\beta=0.50$, $p<0.01$), it had negative significant relations with adaptation ($\beta=-0.29$, $p<0.01$).

Table 5. Results of the path analysis.

Path	B	β	SE	p
Constructivist $\rightarrow$ Intrinsic	1.025	.504	.131	.000
Traditional $\rightarrow$ Extrinsic	.419	.305	.096	.000
Constructivist $\rightarrow$ Extrinsic	.342	.190	.118	.004
Traditional $\rightarrow$ Intrinsic	.242	.156	.086	.005
Intrinsic $\rightarrow$ Adaptation	.247	.564	.028	.000
Extrinsic $\rightarrow$ Adherence	.418	.497	.060	.000
Extrinsic $\rightarrow$ Adaptation	-.143	-.290	.029	.000
Intrinsic $\rightarrow$ Adherence	-.140	-.188	.040	.000
Constructivist $\rightarrow$ Adaptation	.248	.277	.051	.000
Traditional $\rightarrow$ Adherence	.200	.173	.063	.001

3.4. Testing of mediation

As for the mediation effects, there were four specific indirect path coefficients in the model. The results showed that all four indirect path coefficients were significant; two were significantly positive, whereas another two were significantly negative (Table 6). Extrinsic motivation had significantly positive effect on the relationship between traditional conception and adherence ($\beta=.130$, $t=3.084$, $p<.01$). Intrinsic motivation had significantly positive effect on the relationship between constructivist conception and adaptation ($\beta=.183$, $t=4.485$, $p<.01$). On the other hand, intrinsic motivation had significantly negative effect on the relationship between traditional conception and adherence ($\beta=-.030$, $t=3.084$, $p=.01$). Besides, extrinsic motivation had significantly negative effect on the relationship between constructivist conception and adaptation ($\beta=-.054$, $t=4.485$, $p<.01$).

Table 6. Testing of mediation.

Relationships	Direct Effect	Indirect Effect	Bias-corrected CI %95		p	Decision
			Lower	Upper		
Traditional $\rightarrow$ Extrinsic $\rightarrow$ Adherence	.194 (3.084)	.130	.051	.243	.001	Partial mediation
Traditional $\rightarrow$ Intrinsic $\rightarrow$ Adherence	.194 (3.084)	-.030	-.081	-.006	.010	Partial mediation
Constructivist $\rightarrow$ Intrinsic $\rightarrow$ Adaptation	.244 (4.485)	.183	.124	.272	.000	Partial mediation
Constructivist $\rightarrow$ Extrinsic $\rightarrow$ Adaptation	.244 (4.485)	-.054	-.107	-.022	.001	Partial mediation

Note: Unstandardized coefficients reported. Values in parentheses are t- values. Bootstrap sample = 5.000

4. Discussion

This study utilized SEM to investigate the relationship among teaching-learning conceptions, motivation to teach, and curriculum fidelity. The results indicate that teachers' conceptions about teaching and learning can predict their fidelity to the curriculum. According to Zhu et al. (2011), factors such as teachers' adopted educational philosophy, teaching skills, and motivation are key issues within the concept of curriculum fidelity, and teachers' values, beliefs, and personal preferences determine how the curriculum is implemented in school contexts. Similarly, Anderson (1996) asserted that teachers' beliefs are closely linked to curriculum implementation. According to the results shown in Table 4, constructivist conceptions are positively related to adaptation, whereas traditional conceptions are positively correlated with adherence. The findings by Baş and Şentürk (2019) indicate that teachers with constructivist teaching-learning conceptions exhibit higher levels of curriculum fidelity. Similarly, Yılmaz and Kahramanoğlu (2021) found that a constructivist curriculum orientation is a positive and significant predictor of teachers' curriculum fidelity. Rovegno and Bandhauer (1997) reported that teachers who value and believe in a constructivist approach can successfully adapt the curriculum even in disadvantaged contexts. Shawer et al. (2008) claimed that teachers using the adaptation approach create more engaging educational activities compared to those employing the adherence approach, which is consistent with constructivist principles. In contrast to adherence perspectives, adaptation approaches view teachers as learners and active members of the classroom community, as envisaged by constructivism (Cho, 1998). This perspective allows teachers to adapt to changing conditions (Anteneh & Anshu, 2024). Çeliker-Ercan and Çubukçu (2023) suggested that the philosophy of the curricula developed based on constructivism encourage teachers to adapt curriculum materials despite pressures to adhere strictly. Conversely, traditional conceptions limit teachers' roles to transmitters or receivers of the curriculum (Shawer et al., 2009), treating teachers as communication tools (Kumaravadivelu, 2006), and reducing their roles in the classroom (Shawer, 2010), which aligns with an adherence approach based on the positivist paradigm.

When the relationship between teaching-learning conceptions and teaching motivation is examined, the results of the study revealed that both constructivist and traditional conceptions have a positive and significant relationship with both intrinsic and extrinsic motivation. The current research supports Baş's (2022) finding, indicating that teaching and learning beliefs positively and significantly predict motivation to teach. Teaching motivation has belief-related roots (Watt & Richardson, 2008). According to Richardson (1996), beliefs are a subset of constructs that drive individual actions. In this context, teaching beliefs influence teachers' classroom behaviors and practices (Pajares, 1992) as well as their motivation to teach (Kwok-Wai, 2004). Although constructivist conceptions impact both intrinsic and extrinsic motivation, this study found a stronger relationship with intrinsic motivation. Conversely, traditional conceptions were more strongly linked to extrinsic motivation. Roth et al. (2007) indicated that teachers' motivation is associated with student-centered or productive teaching styles. Similarly, research by Baş and Baştuğ (2021) reported a positive and significant correlation between constructivist conceptions and intrinsic motivation, while traditional conceptions had a higher correlation with extrinsic motivation compared to intrinsic motivation.

Another relationship examined in this research was between teachers' motivation to teach and curriculum fidelity. Intrinsic motivation was found to have a positive significant relationship with adaptation and a negative significant relationship with adherence. Conversely, extrinsic motivation had a positive significant relationship with adherence and a negative significant relationship with adaptation. Aytaç (2021) also concluded that both intrinsic and extrinsic motivation are positively and significantly correlated with curriculum fidelity. Motivation to teach impacts classroom teaching practices during the educational process (Uzunçam et al., 2024). Ransford et al. (2009) discovered that psychological factors such as motivation influence curriculum implementation. Furthermore, Bond et al. (2000) asserted a relationship between motivation and curriculum fidelity, and Bay et al. (2017) highlighted that teachers' motivation to teach plays a crucial role in curriculum fidelity.

To further explore the relationships among the variables in the hypothesized model, mediation analysis was conducted. The results of the mediation analysis showed that both intrinsic and extrinsic motivation partially mediated the relationships between constructivist conception and adaptation, and traditional conception and adherence, as all direct and indirect effects were statistically significant (Collier, 2020; Ledermann & Macho, 2015). Specifically, extrinsic motivation acted as a complementary mediator for the direct effect between traditional conception and adherence, as both the direct and indirect effects pointed in the same direction. However, for the relationship between constructivist conception and adaptation, extrinsic motivation served as a competitive mediator because the direct and indirect effects pointed in opposite directions (Zhao et al., 2010). On the other hand, intrinsic motivation was a complementary mediator for the relationship between constructivist conception and adaptation, while it was a competitive mediator for the relationship between traditional conception and adherence.

4.1. Limitations and future recommendations

This study has several limitations that should be acknowledged. Firstly, the data were gathered through self-reported surveys, similar to previous research. While this approach allows for a larger sample size, it may also lead to discrepancies between teachers' perceptions. Future research should incorporate additional methods such as interviews and observations to triangulate the data, thereby enhancing our understanding of the relationships between teachers' teaching-learning conceptions, motivation to teach, and curriculum fidelity. Secondly, the participants in this study were teachers from Türkiye. To gain a more comprehensive perspective, cross-cultural studies should be conducted to explore curriculum fidelity among teachers in various contexts. Thirdly, this study did not include demographic factors like gender, teaching experience, work environment, and academic major in the analysis. Future research should examine the impact of these factors on the relationship between teaching-learning conceptions and curriculum fidelity. Lastly, it is recommended that future studies include more contextual variables, such as attitudes and self-efficacy, to provide a deeper insight into these dynamics.

4.2. Implications

4.2.1. Theoretical implications

The findings underscore the significant interplay between teachers' teaching-learning conceptions and their motivation to teach. Constructivist and traditional conceptions both positively influence intrinsic and extrinsic motivation, though constructivist conceptions have a stronger link to intrinsic motivation. This aligns with the theoretical perspective that educational beliefs shape motivational orientations (Watt & Richardson, 2008). The study enriches the understanding that teaching philosophies not only dictate pedagogical approaches but also impact the motivational drives behind teaching practices.

The positive correlations between constructivist conceptions and adaptation, and traditional conceptions with adherence, reinforce existing theories on curriculum fidelity (Rovegno & Bandhauer, 1997; Shawer et al., 2008). This study extends the theoretical framework by demonstrating how motivational factors mediate these relationships. The dual role of intrinsic and extrinsic motivation as both direct influencers and mediators of curriculum fidelity processes provides a nuanced understanding of how teachers' internal states affect their fidelity to curriculum models.

The mediation analysis highlights intrinsic and extrinsic motivation as partial mediators in the relationship between teaching-learning conceptions and curriculum fidelity. This theoretical implication suggests that while conceptions directly influence fidelity, the motivational orientation can enhance or mitigate this influence, which adds a layer of complexity to existing educational theories on curriculum implementation.

4.2.2. Practical implications

The results suggest that teacher training programs should emphasize the development of both constructivist and traditional teaching-learning conceptions to foster balanced motivational profiles. Training that enhances intrinsic motivation can encourage adaptive approaches to curriculum, while programs focusing on extrinsic motivation might support adherence to prescribed curricula. Tailoring professional development to align with teachers' motivational orientations can enhance curriculum fidelity and overall teaching effectiveness.

Curriculum designers should consider the motivational impacts of curriculum structures. Curricula that support constructivist approaches might benefit from strategies that enhance intrinsic motivation, thereby promoting adaptive teaching practices. Conversely, curricula requiring strict adherence might be more effective if they incorporate elements that bolster extrinsic motivation. Understanding the motivational drivers behind teachers' curriculum fidelity can lead to more effective and sustainable educational practices.

Educational policies should recognize the dual role of teaching-learning conceptions and motivation in curriculum fidelity. Policies that provide flexibility and support for intrinsic motivational factors may foster better adaptation and implementation of curricula. Additionally, policies that incentivize extrinsic motivation can help maintain adherence where necessary. By integrating motivational considerations into policy frameworks, educational systems can achieve a more effective alignment between teaching practices and curriculum goals.

5. Conclusion

This study provides valuable insights into the dynamic relationships between teaching-learning conceptions, motivation to teach, and curriculum fidelity. The findings highlight the significant role of both intrinsic and extrinsic motivation in mediating the effects of teaching-learning conceptions on curriculum fidelity. By elucidating these complex interactions, the study contributes to both theoretical understandings and practical applications in the field of education. The implications for teacher training, curriculum design, and educational policy underscore the importance of considering motivational factors in educational practices. Future research could explore longitudinal impacts and extend these findings across different educational contexts to further validate and expand upon the current study's conclusions.

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References

- Alburo, F. G. (2019). Mathematics teachers' pedagogical beliefs and practices: Does being 'conventional or constructivist matter?'. *The Normal Lights*, 13(1), 83–107.
- Anderson, R. D. (1996). *Study of curriculum reform*. Government Printing Office. ERIC Document: ED397535
- Anteneh, B. A., & Anshu, A. H. (2024). ELT teachers' curriculum implementation approaches in teaching freshman English at Ethiopian public universities' context. *Cogent Education*, 11(1), 2348862. <https://doi.org/10.1080/2331186X.2024.2348862>
- Ayık, A., Ataş-Akdemir, Ö., & Seçer, İ. (2015). Öğretme motivasyonu ölçeğinin Türkçeye uyarlanması: Geçerlik ve güvenirlik çalışması [Adaptation of the motivation to teach scale into Turkish: The validity and reliability study]. *Current Research in Education*, 1(1), 33-45.
- Aytaç, A. (2021). A Study of teachers' self-efficacy beliefs, motivation to teach, and curriculum fidelity: A path analysis model. *International Journal of Contemporary Educational Research*, 8(4), 130-143. <https://doi.org/10.33200/ijcer.898186>
- Baş, G. (2022). Effect of student teachers' teaching beliefs and attitudes towards teaching on motivation to teach: mediating role of self-efficacy. *Journal of Education for Teaching*, 48(3), 348-363. <https://doi.org/10.1080/02607476.2021.2006043>
- Baş, G., & Baştuğ, M. (2021). Teaching-learning conceptions, teaching motivation, and perceptions towards ICT: A research in Turkish public high schools. *Education and Information Technologies*, 26(2), 1607-1625. <https://doi.org/10.1007/s10639-020-10324-y>

- Baş, G., & Şentürk, C. (2019). Teaching-learning conceptions and curriculum fidelity: A relational research. *International Journal of Curriculum and Instruction*, 11(2), 163-180.
- Bay, E., Kahramanoğlu, R., Döş, B., & Özpolat, E. T. (2017). Analysis of factors affecting curriculum fidelity. *Mehmet Akif Ersoy University Journal of Education Faculty*, 43, 110-137. <https://doi.org/10.21764/efd.02208>
- Bıkmaz, F. (2023). Dünyada ve Türkiye’de program geliştirme çalışmaları [Curriculum development studies in the world and in Türkiye]. In M. Güven & S. Aslan (Eds.), *Çağdaş gelişmeler ışığında eğitimde program geliştirme ve değerlendirme [Curriculum development and evaluation in education in the light of contemporary developments]* (pp.633-675). Pegem Akademi.
- Bond, G. R., Evans, L., Salyers, M. P., Williams, J., & Kim, H. K. (2000). Measurement of fidelity in psychiatric rehabilitation. *Mental Health Services Research*, 2, 75-87. <https://doi.org/10.1023/A:1010153020697>
- Browne, M. W., & Cudeck, R. (1992). Alternative ways of assessing model fit. *Sociological Methods & Research*, 21(2), 230-258. <https://doi.org/10.1177/0049124192021002005>
- Bümen N. T., Çakar E., & Yıldız D. G. (2014). curriculum fidelity and factors affecting fidelity in the Turkish context. *Educational Sciences: Theory & Practice*, 14(1), 219-228.
- Byrne, B. M. (2016). *Structural equation modeling with amos: Basic concepts, applications, and programming* (3rd ed.). Routledge.
- Çeliker-Ercan, G., & Çubukçu, Z. (2023). Curriculum implementation approaches of secondary school English teachers: A case study. *Kastamonu Education Journal*, 31(3), 347-366. <https://doi.org/10.24106/KEFDERGI-2021-0006>
- Chan, K. W., & Elliott, R. G. (2004). Relational analysis of personal epistemology and conceptions about teaching and learning. *Teaching and Teacher Education*, 20(8), 817-831.
- Charlesworth, R., Hart, C. H., Burts, D. C., Thomasson, R. H., Mosley, J., & Fleege, P. O. (1993). Measuring the developmental appropriateness of kindergarten teachers’ beliefs and practices. *Early Childhood Research Quarterly*, 8(3), 255-276. [http://dx.doi.org/10.1016/S0885-2006\(05\)80067-5](http://dx.doi.org/10.1016/S0885-2006(05)80067-5)
- Cho, J. (1998). *Rethinking curriculum implementation: Paradigms, models and teachers’ work* [Paper presentation]. Annual Meeting of the American Educational Research Association. <https://doi.org/10.24941/ijcr.35889.07.2019>
- Çobanoğlu, R., & Çapa-Aydın, Y. (2015). When early childhood teachers close the door: Self-reported fidelity to a mandated curriculum and teacher beliefs. *Early Childhood Research Quarterly*, 33, 77-86. <http://dx.doi.org/10.1016/j.ecresq.2015.07.001>
- Cohen, L., Manion, L., & Morrison, K. (2018). *Research methods in education* (8th ed.). Routledge.

- Collier, J. E. (2020). *Applied structural equation modeling using AMOS: Basic to advanced techniques*. Routledge.
- Dane, A. V., & Schneider, B. H. (1998). Program integrity in primary and early secondary prevention: Are implementation effects out of control?. *Clinical Psychology Review*, 18, 23-45. [https://doi.org/10.1016/S0272-7358\(97\)00043-3](https://doi.org/10.1016/S0272-7358(97)00043-3)
- Deci, E. L., & Ryan, R. M. (2001). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11, 227-268.
- Deci, E. L., Vallerand, R. J., Pelletier, L. G., & Ryan, R. M. (1991). Motivation and education: The self-determination perspective. *Educational Psychologist*, 26(3 & 4), 325-346.
- Deng, F., Chai, C. S., Tsai, C. C., & Lee, M. H. (2014). The relationships among Chinese practicing teachers' epistemic beliefs, pedagogical beliefs and their beliefs about the use of ICT. *Journal of Educational Technology & Society*, 17(2), 245-256.
- Derakhshan, A., Coombe, C., Arabmofrad, A., & Taghizadeh, M. (2020). Investigating the effects of English language teachers' professional identity and autonomy in their success. *Issues in Language Teaching*, 9(1), 1-28. <https://doi.org/10.22054/ilt.2020.52263.496>
- Doruk, B. K. (2022). Öğrenme ve öğretme anlayışı ölçeğinin revizyonu ve kısa formunun geliştirilmesi [Adaptation of the conception for teaching and learning scale and development of its short form]. *Erciyes Journal of Education*, 6(1), 1-18.
- Driscoll, M. P., & Burner, K. J. (2022). *Psychology of learning for instruction* (4th ed.). Pearson.
- Dusenbury, L.A, Brannigan, R., Falco, M., & Hansen, W. B. (2003). A review of research on fidelity of implementation: Implications for drug abuse prevention in school settings. *Health Education Research*, 18(2), 237-256. <https://doi.org/10.1093/her/18.2.237>
- Fullan, M. (2015). *The new meaning of educational change* (5th ed.). Teachers College Press.
- Gordon, W. R., Taylor, R. T., & Oliva, P. F. (2019). *Developing the curriculum: Improved outcomes through systems approaches*. Pearson.
- Gore, V. (2013). 21st century skills and prospective job challenges. *The IUP Journal of Soft Skills*, 7(4), 7-14.
- Gredler, M. E., Brousard, S. C., & Garrison, M. E. B. (2004). The relationship between classroom motivation and academic achievement in elementary school-aged children. *Family and Consumer Sciences Research Journal*, 33(2), 106-120.
- Gürbüz, Ş., & Şen, H. Ş. (2023). Teachers' curriculum literacy and curriculum fidelity: Differences according to certain variables. *International Journal of Research in Teacher Education (IJRTE)*, 14(1), 1-23. <https://doi.org/10.29329/ijrte.2023.523.1>
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage.

- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- Kauffman, D. F., Soylu, M. Y., & Duke, B. (2011). Validation of the motivation to teach scale. *Hacettepe University Journal of Education*, 40, 279-290.
- Kline, R. B. (2023). *Principles and practice of structural equation modeling* (5th ed.). Guilford Press.
- Kumaravadivelu, D. (2006). *Understanding language teaching: From method to post-method*. Lawrence Erlbaum. <https://doi.org/10.4324/9781410615725>
- Kwok-Wai, C. (2004). Teacher professional development: In-service teachers' motives, perceptions and concerns about teaching. *Hong Kong Teachers' Centre Journal*, 3, 56–71.
- LaChausse, R. G., Clark, K. R., & Chapple, S. (2014). Beyond teacher training: The critical role of professional development in maintaining curriculum fidelity. *Journal of Adolescent Health*, 54(3), 53-58. <https://dx.doi.org/10.1016/j.jadohealth.2013.12.029>
- Larsen, T., & Samdal, O. (2007). Implementing second step: Balancing fidelity and program adaptation. *Journal of Educational and Psychological Consultation*, 17(1), 1-29.
- Ledermann, T., & Macho, S. (2015). Assessing mediation in simple and complex models. In L. Rivera (Ed.), *Structural equation modeling (SEM): Concepts, applications, and misconceptions* (pp. 69-102). Nova Science Publishers.
- Marsh, C. J., & Willis, G. (2007). *Curriculum: Alternative approaches, ongoing issues* (3rd ed.). Prentice Hall.
- Mayer, R. E. (2003). Theories of learning and their application to technology. In H. F. O'Neil & R. S. Perez (Eds.), *Technology applications in education: A learning view*. Lawrence Erlbaum.
- Norman, D. A., & Spohrer, J. C. (1996). Learner-centered education. *Communications of the ACM*, 39(4), 24-27.
- Ntoumanis, N. & Mallet, C. (2014). Motivation in sport: A self-determination theory perspective. In Papaioannou, A. & Hackfort, D. (Eds.), *Routledge Companion to Sport and Exercise Psychology: Global perspectives and fundamental concepts* (pp. 67-82). Routledge.
- Öner-Sunkur, M. & Yılmaz, F. (2024). Prediction of elementary school teachers' curriculum fidelity by demographic variables and curriculum literacy. *Athens Journal of Education*, 11, 1-20. <https://doi.org/10.30958/aje.X-Y-Z>
- Pajares, M. F. (1992). Teachers' beliefs and educational research: Cleaning up a messy construct. *Review of Educational Research*, 62(3), 307–332. <https://doi.org/10.3102/00346543062003307>

- Pence, K., Justice, L., & Wiggins, A.K. (2008). Preschool teachers' fidelity in implementing a comprehensive language-rich curriculum. *Language, Speech, and Hearing Services in Schools*, 39(3), 329-341. [https://doi.org/10.1044/0161-1461\(2008/031\)](https://doi.org/10.1044/0161-1461(2008/031))
- Posner, G. J. (2004). *Analyzing the curriculum* (3rd ed.). McGraw-Hill.
- Ransford, C. R., Greenberg, M. T., Domitrovich, C. E., Small, M., & Jacobson, L. (2009). The role of teachers' psychological experiences and perceptions of curriculum supports on the implementation of a social and emotional learning curriculum. *School Psychology Review*, 38(4), 510-532.
- Richardson, V. (1996). The role of attitudes and beliefs in learning to teach. In J. Sikula, T. J. Buttery, & E. Guyton (Eds.), *Handbook of research on teacher education* (pp.102-119). Simon & Schuster Macmillan.
- Robbins, S. P., & Judge, T. A. (2012). *Organizational behavior* (15th ed.). Prentice Hall.
- Roth, G., Assor, A., Kanat-Maymon, Y., & Kaplan, H. (2007). Autonomous motivation for teaching: How self-determined teaching may lead to self-determined learning. *Journal of Educational Psychology*, 99(4), 761-774. <https://doi.org/10.1037/0022-0663.99.4.761>
- Rovegno, I., & D. Bandhauer. (1997). Norms of the school culture that facilitated teacher adoption and learning of a constructivist approach to physical education. *Journal of Teaching in Physical Education*, 16, 401-25.
- Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, 25, 54-67.
- Ryu, M. (2015). Action research on elementary music class by pre-service teachers based on curriculum literacy. *International Journal of u-and e-Service, Science and Technology*, 8(8), 65-76.
- Shawer, S. (2010). Classroom-level curriculum development: ELT teachers as curriculum-developers, curriculum-makers and curriculum-transmitters. *Teaching and Teacher Education: An International Journal of Research and Studies*, 26(2), 173-184. <https://doi.org/10.1016/j.tate.2009.03.015>
- Shawer, S., Gilmore, D., & Banks-Joseph, S. (2009). Learner-driven ELT curriculum development at the classroom level. *The International Journal of Teaching and Learning in Higher Education*, 20(2), 125-143.
- Shawer, S., Gilmore, D., & Banks-Joseph, S. R. (2008). Student cognitive and affective development in the context of classroom-level curriculum development. *Journal of the Scholarship of Teaching and Learning*, 8(1), 1-28.
- Tanaş, R., & Tuncer, M. (2023). The relationship between teachers' curriculum literacy skills and their curriculum fidelity. *The Journal of Educational Reflections*, 7(1), 13-21.
- Uzunçam, M., Erdoğan, H., & Özkan, E. (2024). Öğretmenlerin özdüzenleme becerileri öğretme motivasyonları ve program okuryazarlığı arasındaki ilişkinin incelenmesi:

- Literatür incelemesi [Examination of the relationship between teachers' self regulation skills, teaching motivation, and curriculum literacy: A literature review]. *Eurasian Journal of Social and Economic Research*, 11(1), 420-455.
- Van den Berghe, L., Vansteenkiste, M., Cardon, G., Kirk, D., & Haerens, L. (2014). Research on self-determination in physical education: Key findings and proposals for future research. *Physical Education and Sport Pedagogy*, 19(1), 97-121.
- Voogt, J., & Roblin, N. P. (2012). A comparative analysis of international frameworks for 21st century competences: Implications for national curriculum policies. *Journal of Curriculum Studies*, 44(3), 299-321. <https://doi.org/10.1080/00220272.2012.668938>
- Wang, J., Elicker, J., McMullen, M., & Mao, S. (2008). Chinese and American preschool teachers' beliefs about early childhood curriculum. *Early Child Development and Care*, 178(3), 227-249. <http://dx.doi.org/10.1080/03004430600722671>
- Wang, Y. (2017). Construction elements and path of practical education model in universities. *EURASIA Journal of Mathematics, Science and Technology*, 13(10), 6775-6782. <https://doi.org/10.12973/ejmste/78525>
- Watt, H. M. G., & Richardson, P. W. (2008). Motivations, perceptions, and aspirations concerning teaching as a career for different types of beginning teachers. *Learning and Instruction* 18 (5): 408-428. <https://doi.org/10.1016/j.learninstruc.2008.06.002>
- Wilcox-Herzog, A. S., Ward, S. L., Wong, E. H., & McLaren, M. S. (2015). Preschool teachers' ideas about how children learn best. An examination of beliefs about developmentally appropriate practice. In H. Fives, & M. G. Gill (Eds.), *International handbook of research on teachers' beliefs* (pp. 421-435). Routledge.
- Woolfolk, A. (2016). *Educational psychology* (13th ed.). Pearson.
- Xia, Y., & Yang, Y. (2019). RMSEA, CFI, and TLI in structural equation modelling with ordered categorical data: The story they tell depends on the estimation methods. *Behaviour Research Methods*, 51, 409-428. <https://doi.org/10.3758/s13428-018-1055-2>
- Yıldız, S. (2018). The relationship between the curriculum design orientations preference and curriculum fidelity of preservice teachers. *International Online Journal of Educational Sciences*, 10(2), 1-12. <https://doi.org/10.15345/iojes.2018.02.001>
- Yılmaz, G., & Kahramanoğlu, R. (2021). Examining the relationship between curriculum literacy levels, curriculum orientations and curriculum fidelity levels of teachers. *Journal of Interdisciplinary Educational Research*, 5(10), 178-187.
- Zhao, X., Lynch Jr, J. G., & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and truths about mediation analysis. *Journal of Consumer Research*, 37(2), 197-206.
- Zhu, X., Ennis, C. D., & Chen, A. (2011). Implementation challenges for a constructivist physical education curriculum. *Physical Education and Sport Pedagogy*, 16(1), 83-99. <https://doi.org/10.1080/17408981003712802>