Development of the Inventory of Orientations in Curriculum Theories (IOCT) for Pre-Service Teachers

Ersin Türe[i]
Erzincan Binali Yildirim University

Abstract

It is known that pre-service teacher training has an impact on orientations, beliefs, and views on teaching and teaching practices. In addition, it was determined that the curriculum theory orientations scale for teachers developed by Türe & Bıkmaz (2023) was not suitable for the sample of undergraduate students of the faculty of education. Because there are structural differences between the teacher sample and the undergraduate student sample. Faculty of Education undergraduate students are individuals who continue to be trained with the aim of training teachers. On the other hand, the pre-service teachers of the sample in which the scale could be developed and applied was selected from third and fourth-year undergraduate students who had completed the course on "Curriculum". Therefore, the aim of this study is to develop a measurement tool that will determine the curriculum theory orientations of undergraduate students studying in education faculties. In this study, a measurement tool was developed to determine the orientations of pre-service teachers regarding curriculum theories. The IOCT for prospective teachers consists of three scales: OSPCT, OSDCT and OSCECT. OSPCT for pre-service teachers consists of two factors 19 items; OSDCT for pre-service teachers consists of two factors 12 items and OSCECT for pre-service teachers consists of three factors, 19 items. It has been revealed that the structure and items of the scales in the IOCT developed for pre-service teachers differ from the structure and items of the scales in the IOCT developed for teachers by Türe & Bıkmaz (2023).

Keywords: IOCT for Pre-Service Teachers, Curriculum Theory Orientations, Pre-Service Teacher

----

[i] **Ersin Türe,** Assist. Prof. Dr., Education Sciences, Erzincan Binali Yildirim University, ORCID: 0000-0001-8110-575X

Email: ersinture@gmail.com

INTRODUCTION

The achievements of teacher candidates during their teacher education process are among the most significant variables that will underpin their future teaching careers. Theoretical courses and practices in teacher education programs prepare prospective teachers for their future professional lives. Theoretical lessons and practices provide prospective teachers with reflections on their professional lives. These reflections turn into theoretical foundations on which pre-service teachers will continue their professional lives and implement their curriculums.

Studies show that the theories accepted by teachers (Chant, 2002; Cornett, 1990) and their beliefs about the curriculum (Peacock, 2001) shape their instructional decisions and teaching practices. Because teachers' beliefs and theories are one of the most important factors determining curriculum practices (Pajares, 1992; Hasweh, 2003). For this reason, it is important which theoretical orientations pre-service teachers advance in their training process. Curriculum orientation of pre-service teachers shapes their perspectives on the objectives, expected learning outcomes, content, activities carried out, and evaluation processes related to the curriculum. On the other hand, curriculum specialists and teachers, in other words, theorists, and practitioners, do not see eye to eye with each other (Klein, 1992; Donmayer, 1989; McCutcheon, 1985; Vallance 1982). Therefore, to comprehend the tension between theory and practice and the issues of understanding between curriculum specialists and teachers, it is necessary to have knowledge about the theoretical development of teacher candidates.

Determining the variables involved in the formation of teachers' theories will also affect teacher educators' strategies for teacher training (Clark & Peterson, 1986). In addition, it has been stated that pre-service teachers should be supported by teacher educators in the development of internal models related to theory and practice (Harste, Leland, Schmidt, Vasquez, & Ociepka, 2002). It is stated that there is a relationship between reflective thinking levels and the personal theory formation process (Killion, Joellen, & Todnem, 1991). This process may lead to changes in the approach to reflective thinking skills; in other words, it can also contribute to developing pre-service teachers' high-level thinking skills.

In the literature, measurement tools aiming to identify theoretical orientations toward curriculum have been developed. Based on the classification made by McNeil (1977), the "Curriculum Orientation Inventory (COI)" developed by Cheung (2000) and revised by Cheung and Wong (2002) is classified five dimensions as "academic, cognitive processes, technological, humanist, and social restructuring". COI was modified by Rice & Mahlios (2003). It was observed that when the developed measurement tool was adapted to different cultures, some items shifted between factors (Jenkins, 2009). Building on the classification of curriculum theorists into prescriptive, descriptive, and critical-exploratory by Marsh and Willis, 2003; Türe (2017) and Türe & Bıkmaz (2023) developed an orientation inventory of curriculum theories for teachers. In this inventory, three separate scales were developed for prescriptive, descriptive, and critical-exploratory theorists.

According to the literature, it is evident that scales related to curriculum orientations were developed and adapted for teachers by researchers such as Cheung & Ng, 2000; Crummey, 2007; Reding, 2008; Brown, Lake, & Matters, 2011. In Turkey, Eren (2010) adapted the Cheung & Wong (2002) inventory for pre-service teachers. Then, different studies were carried out on pre-service teachers with this inventory (Bay, Gündoğdu, Ozan, Dilekçi, & Özdemir, 2012; Tanrıverdi & Apak, 2014; Yeşilyurt, 2012; Abakay, Şebin & Şahin, 2013). Developing a specific inventory for pre-service teachers in the context of curriculum theories will be useful for changes in the teacher training system.

The Philosophical and Theoretical Origins of the Orientation Inventory (IOCT) on Curriculum Theories for Pre-Service Teachers

Marsh and Willis (2003) classified curriculum theorists into three categories based on groupings made by Macdonald (1971) and Jackson (1992). From this point of view Marsh and Willis

(2003) classified curriculum theorists into the following categories: prescriptive, descriptive and critical-exploratory.

Table 1. Classification of Paradigms/Perspectives on Curriculum Theories

Prescriptive	Descriptive	Critical-Exploratory
Social needs- child-centered	Pragmatists	Biographical
Social needs- reconstruction		Phenomenological
Philosophical-academic rationalism		Existential/ psychoanalytic
Social Effectiveness		Gender analysis and feminist pedagogy
Rational/ technical		Cultural reproduction
		Social Reproduction
		Literary artist
		Postmodernism/poststructuralism
		Racist

Source: Marsh and Willis, (2003)

Table 1 provides a classification of curriculum theorists with different approaches. It can be said that prescriptive theorists focus on society, descriptive theorists focus on the individual and more specific groups, and critical-explanatory theorists focus on taking a stance against social and individual inequalities. This study aims to develop the "The Inventory of Orientations in Curriculum Theories (IOCT)" for pre-service teachers.

METHOD

This section provides information about the study group of the research and the development stages of the inventory. In this context, clustering analysis was performed in the QDA Miner qualitative analysis program to obtain the items during the development phase of IOCT for pre-service teachers. Expert opinions were sought for the obtained items, and the content validity ratios of the items were calculated. Subsequently, validity and reliability analyses of the draft items were performed. For exploratory factor analysis, the SPSS program was used, and for confirmatory factor analysis, the Mplus package program was utilized.

Study Group

In the 2022-2023 academic year, a study group was formed among the pre-service teachers who received undergraduate education at the Faculty of Education. The fact that the undergraduate students of the education faculty in the study group achieved the curriculum course was used as a criterion. Data were obtained from the study groups to perform exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) during the scale development process (Erkuş, 2012).

A study group of 293 participants was used in the EFA. In the CFA process, study groups consisting of 469 for the Orientation Scale for Prescriptive Curriculum Theories (OSPCT), 466 for the Orientation Scale for Descriptive Curriculum Theories (OSDCT) for pre-service teachers, and 465 for the Orientation Scale for Critical-Explanatory Curriculum Theories (OSCECT) for pre-service teachers were created.

Item Pool Writing Process of IOCT for Pre-Service Teachers

When reviewing the literature, the main source of the items to be included in a measurement tool is the item pool of IOCT for teachers developed by Türe (2017) and Türe & Bıkmaz (2023). Since the new scale is intended for pre-service teachers, a comprehensive process was undertaken, including re-examination, qualitative clustering analysis using available resources, solicitation of expert opinions, and interviews with a group of 15 pre-service teachers to assess the clarity of the items. The updated literature review was incorporated into the classification framework originally established by Marsh and Willis (2003). Within this context, the works of prescriptive, descriptive, and critical-explanatory theorists were re-evaluated, and new contributions were integrated into the framework. In

the process of composing the items in the inventory, firstly, the sources obtained after the literature review were analyzed by qualitative clustering. As a result of this analysis, dendrograms (clustering charts) belonging to 3 separate document files were obtained. The words in each clustering chart were called from the documents in various combinations. The sentences obtained were converted into items and added to the item pool obtained by Türe (2017) and Türe & Bıkmaz (2023). During this process, sentences that posed challenges in terms of comprehension due to the analysis were re-examined with the assistance of language and subject matter experts. The author conducted a thorough review and editing of all items tailored for pre-service teachers. Following the completion of the item writing process, the items underwent expert validation.

Content Validity Rate is also used as an estimator for content or construct validity. The content validity rates are obtained by collecting the opinions of the experts on the items. For the inventory, opinions were obtained from 6 experts who specialized in 2 measurement and evaluation, 3 curriculum and instruction, and 1 Turkish education. In line with the opinions of 6 specialist, items with a CVR value less than 0.99 were excluded from the item pool.

The scale items were prepared in a 5-point Likert type as 'I totally disagree', 'I do not agree', 'I agree moderately', 'I agree' and 'I totally agree'. Then, the draft item pool form was applied to 15 undergraduate students to determine whether the items were understood or not. As a result of the arrangements made, 46 items were included in the item pool of Orientations Related to Prescriptive Curriculum Theories Scale for pre-service teachers, 38 items were included in the item pool of Orientations Related to Descriptive Curriculum Theories Scale for pre-service teachers, and 51 items were included in the item pool of Orientation Scale Related to Critical-Explanatory Curriculum Theories for pre-service teachers. Then, the inventory was applied to the study groups to perform exploratory factor analysis and confirmatory factor analysis.

RESULTS

Findings Related to the Psychometric Properties of the Scales in the IOCT for Pre-service Teachers

The psychometric properties of the Orientation Scales Regarding the Prescriptive, Descriptive and Critical-Explanatory Curriculum Theories in IOCT are given below.

Testing the Requirements of the IOCT for Pre-service Teachers for Factor Analysis of the Data Sets of OSPCT, OSDCT and OSCECT

Exploratory factor analysis was performed to reveal the construct validity of the inventory's OSPCT, OSDCT and OSCECT. Since exploratory factor analysis is a parametric test, it is necessary to reveal whether the requirements are met. In this context, it was examined whether the data met the requirements of normality, multivariate normality, linearity, extreme value and multicollinearity. Descriptive statistics of the study group and OSPCT; skewness = .324, kurtosis = .712 for OSDCT; and skewness= .145, kurtosis= .397 values for OSCECT show that normality is achieved. To determine the extreme values, the total scores were converted into standardized z scores. Data exceeding -4 and +4 values were accepted as extreme values. Mahalanobis distances were tested by using regression in order to determine the versatile extreme values, which is another study. Outliers exceeding the critical chi-square value for OSPCT were deleted from the resulting values.

It has also been examined whether there is a multicollinearity problem in the data pattern. The values of VIF for OSPCT are 1.42 and 1.45; the values of VIF for OSDCT are 1.65, 1.28; the OSCECT was 1.21, 1.18, and it was observed that VIF<10. Tolerance values for independent variables are .523 and .221 for OSPCT; It was determined that the values of .329, .852 for OSDCT, and .719, .321 for OSCECT were greater than .10. State condition indices (CI) were 6.18 and 21.36 for OSPCT; t was determined that they were between 3.12 and 13.23 for OSDCT and 7.31 to 14.28 for OSCECT and were less than 30. It can be said that this is another sign that there is no multicollinearity problem.

The shapes of the diagrams in the matrix created for multivariate normality and linearity analysis were found to be close to ellipse. In this context, it was seen that the multivariate normality and linearity assumptions were also met. On the other hand, linear, logarithmic, inverse, quadratic and cubic values of variable distributions were examined. Among these values, the linearity score being higher than the others can be seen as another proof.

Factor analysis began by examining the suitability of the dataset, which was assessed using the Kaiser-Meyer-Olkin (KMO) measure. The KMO values obtained were as follows: .940 for OSPCT , .892 for OSDCT, and .758 for OSCECT. For the dataset to be deemed suitable for factor analysis, the KMO value should ideally be above .50 (Büyüköztürk, 2003; Özdamar, 2013). Furthermore, the Bartlett Test, which serves the same purpose, yielded the following results: [χ^2 = 2549,561; p<0.01] for OSPCT, [χ^2 = 4704.359; p<0.01] for OSDCT, and [χ^2 = 3480.817; p<0.01] for OSCECT. These values indicate that factor analysis can indeed be conducted on the specified datasets.

EFA Results Regarding OSPCT for Pre-service Teachers

As a result of the exploratory factor analysis, 6, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, 19, 20, 21, 22, 23, 25, 26, 28, 29, 30, 40, 41, 42, 43, 44 and 45 items were excluded from the scale because they had a low item-total correlation, did not show sufficient factor load (those with a factor load below .400) and deteriorated their factor structures.

Table 2. Factor Analysis of OSPCT for Pre-service Teachers Primary Factor Load Values and Item Total Correlation Results

Item No.	First Factor Load Value	Item-Total Correlation	Item No.	First Factor Load Value	Item-Total Correlation
M16	.684	.468	M38	.733	.613
M24	.684	.484	M39	.685	.500
M27	.731	.558	M46	.666	.470
M31	.651	.432	M1	.586	.520
M32	.719	.528	M2	.653	.654
M33	.638	.430	M3	.676	.623
M34	.692	.479	M4	.515	.478
M35	.726	.620	M5	.569	.454
M36	.666	.558	M7	.596	.594
M37	.708	576			

According to Table 2., it was determined that because of the exploratory factor analysis, the primary factor loads of the remaining items in the scale did not fall below .515 and the item-total correlations did not fall below .430. It is seen that the primary factor loading values of the items included in the scale vary between .515 and .731. It was determined that the item-total correlations ranged between .430 and .623. The anti-image correlation values of the items are given in Table 3.

Table 3. Anti-image Correlation Values of the Items of OSPCT for Pre-Service Teachers

Item No.	Anti–Image Correlation Values	Item No.	Anti–Image Correlationv Values
M16	.951	M38	.937
M24	.959	M39	.945
M27	.939	M46	.937
M31	.958	M1	.889
M32	.947	M2	.907
M33	.955	M3	.935
M34	.945	M4	.918
M35	.951	M5	.949
M36	.936	M7	.937
M37	.946		

According to Table 3., it was determined that the anti-image correlation values of the items ranged between .889 and .959. It is seen that the anti-image values of the items in the scale do not fall below .50. According to Özdamar (2013), this situation shows that the contribution of the load values of the items to the factor structure is high. The Scree Plot graph obtained from the exploratory factor analysis is presented in Figure 1.
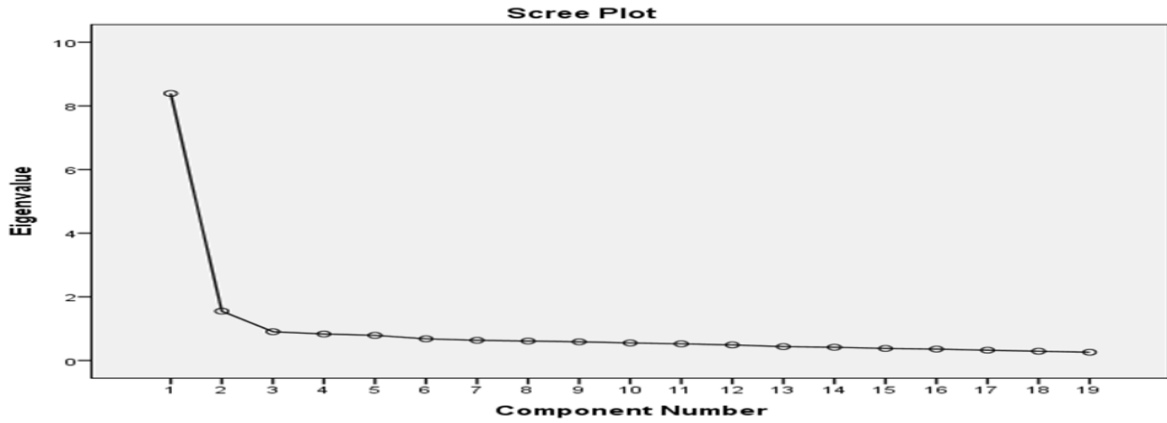

Figure 1. Scree Plot of OSPCT

In Figure 1, it is seen that a flattening started in the graph after the second factor, and this continues. This shows that there is no new factor after the flattening point of the graph (Büyüköztürk, 2003). Accordingly, the graph gives the idea that the scale consists of two factors.

Table 4. Factors Obtained from Varimax Rotation of OSPCT for Pre-service Teachers and Loads of Items Underneath These Factors

	Factors			
	1	2	Cronbach Alpha Value	Percentage of Variances Explained
M16	.544			
M24	.628			
M27	.681			
M31	.579		.915	
M32	.642			44,160
M33	.604			
M34	.568			
M35	.765			
M36	.737			
M37	.733			
M38	755			
M39	.657			
M46	.633			
M1		.684		
M2		.770		
M3		.728		
M4		.576	.825	
M5		.627		8,156
M7		.746		

Variance Explained by Two Factors = 52,315 %
Cronbach Alpha = .926

When the table 4. is examined;

The remaining items were placed under two factors. After these processes, it was seen that there were 19 items on the scale. The variance explained by the items under the first factor is % 44.160; The variance explained by the second factor was % 8,156 and the total explained variance rate of the scale was % 52,315. The Cronbach–Alpha internal consistency coefficient of the first factor of the scale was .915; The Cronbach-Alpha internal consistency coefficient of the second factor was .825 and the Cronbach-Alpha internal consistency coefficient of the scale was found to be .926. In this case, it can be said that all items have a high contribution to reliability (Özdamar, 2013).

- Items 16, 24, 27, 31, 32, 33, 34, 35, 36, 37, 38, 39 and 46 constitute a sub-dimension (first sub-dimension),

- Items 1, 2, 3, 4, 5 and 7 constitute a sub-dimension (second sub-dimension),

The inventory was finalized as a result of the exploratory factor and reliability analysis on *OSPCT for Pre-Service Teachers.* According to this;

- Items 16, 24, 27, 31, 32, 33, 34, 35, 36, 37, 38, 39 and 46, *items 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11,* Renumbered *12 and 13.* The sub-dimension formed by these items is " *The deterministic structure of curriculum*",

- Items 1, 2, 3, 4, 5 and 7 have been renumbered *items 14, 15, 16, 17, 18* and *19.* The sub-dimension formed by these items was named the " *Social reproduction function of curriculum*" sub-dimension.

EFA Results of the Inventory Related to OSDCT for Pre-Service Teachers

For Pre-service teachers As a result of the exploratory factor analysis of OSDCT, 3, 4, 6, 7, 8, 9, 11, 12, 13, 14, 15, 17, 18, 19, 20, 21, 26, 27, 28, 30, 31, 32, 33, 34, 36, and 37 items were excluded from the scale because they had a low item-total correlation, did not show sufficient factor load (those with a factor load below .400) and deteriorated their factor structures. Item factor load values and item-total correlations are given in Table 5, and the anti-image correlation values of the items are given in Table 6.

Table 5. Factor Analysis Primary Factor Load Values and Item Total Correlation Results of OSDCT for Pre-service Teachers

Item No.	First Factor Load Value	Item-Total Correlation	Item No.	First Factor Load Value	Item-Total Correlation
M1	.705	.507	M29	.603	.487
M2	.680	.521	M35	.666	.517
M5	.595	.494	M38	.612	.495
M10	.677	.447			
M16	.670	.583			
M22	.712	.623			
M23	.688	.704			
M24	.761	.779			
M25	.746	.741			

According to the Table 5, it was determined that the primary factor loads of the remaining items in the scale did not fall below .595 and the item-total correlations did not fall below .447 as a result of the exploratory factor analysis. It is seen that the primary factor loading values of the remaining items vary between .595 and .761. The item-total correlations vary between .447 and .779.

Table 6. Anti-image Correlation Values of the Items of OSDCT for Pre-service Teachers

Item No.	Anti–Image Correlation	Item No.	Anti–Image Correlation
M1	.889	M29	.913
M2	.887	M35	.929
M5	.911	M38	.930
M10	.947		
M16	.890		
M22	.936		
M23	.910		
M24	.872		
M25	.888		

According to the Table 6, it was determined that the anti-image correlation values of the items ranged between .872 and .947. These results show that the contribution of the load values of the items to the factor structure is high.
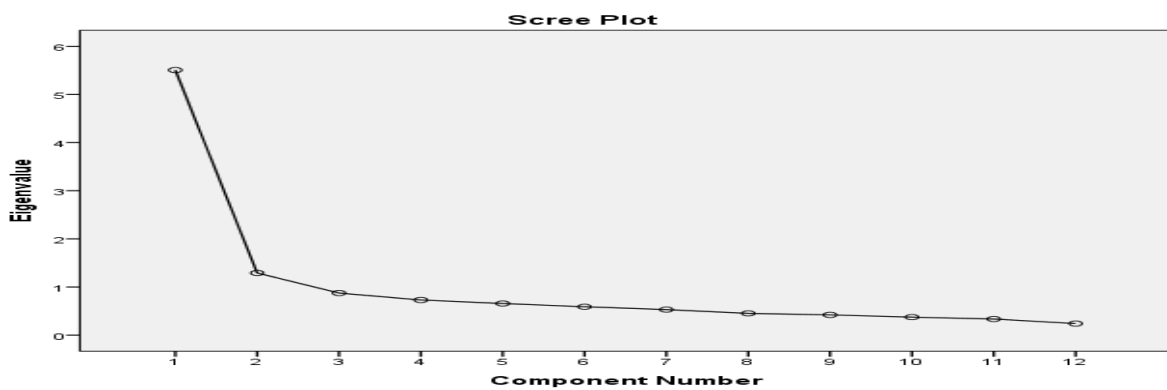

Figure 2. Scree Plot Chart of OSDCT for Pre-service Teachers

In Figure 2. it is seen that a flattening started in the graph after the second factor and this continues. It shows that there is no new factor after the point where the graph starts to flatten (Büyüköztürk, 2003). Accordingly, the graph gives the idea that the scale can consist of two factors.

Table 7. Factors Obtained from Varimax Rotation of OSDCT for Pre-Service Teachers and Loads of Items Underneath These Factors

	Factors			
	1	2	Cronbach Alpha Value	Percentage of Variances Explained
M1	.590			
M2	.666			
M5	.576			30,013
M10	.522	.815		
M16	.742			
M29	.682			
M35	.676			
M38	.687			
M22		.732		
M23		.818	.860	26,639
M24		.842		
M25		.819		

Variance Explained by Three Factors = % 56,652
Cronbach Alpha = .866

The remaining items were placed under two factors. After these processes, it was seen that there were 12 items on the scale. The variance explained by the items under the first factor is %30,013; The variance explained by the second factor was % 26.639, and the total explained variance rate of the scale was % 56.652. The Cronbach–Alpha internal consistency coefficient of the first factor

of the scale was .815; The Cronbach-Alpha internal consistency coefficient of the second factor was .860 and the Cronbach-Alpha internal consistency coefficient of the scale was found to be .866. In this case, it can be said that all items have a high contribution to reliability (Özdamar, 2013).

According to the Table 7:

- Items 1, 2, 5, 10, 16, 29, 35 and 38 constitute the first sub-dimension (first sub-dimension),

- Items 22, 23, 24, and 25 constitute the second dimension (second sub-dimension).

The inventory was finalized as a result of the exploratory factor and reliability analysis on *OSDCT for Pre-Service Teachers.* According to this;

- Items 1, 2, 5, 10, 16, 29, 35 and 38' are renumbered as items 1, 2, 3, 4, 5, 6, 7 and 8**.** The sub-dimension formed by these items is "*The nature and structure of the Curriculum*",

- Items 22, 23, 24 and 25 have been renumbered as items 9, 10, 11, and 12**.** The sub-dimension formed by these items was named " *The role of the teacher in the context of curriculum* " sub-dimension.

EFA Results of the Inventory Related to OSCECT for Pre-service Teachers

OSCECT for pre-service teachers As a result of the exploratory factor analysis using the factor analysis method, 1, 2, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 20, 23, 24, 26, 27, 28, 30, 32, 33, 34, 35, 36, 37, 39, 40, 43, 47, 48, 50 and 51 numbered items have low item-total correlation, they do not show sufficient factor load (those with a factor load below .400) and factor structures It was decided to exclude them from the scale due to Item factor load values and item-total correlations are given in Table 7, and the anti-image correlation values of the items are given in Table 8.

Table 8. Factor Analysis Primary Factor Load Values and Item Total Correlation Results of OSCECT for Pre-service Teachers

Item No.	First Factor Load Value	Item-Total Correlation	Item No.	First Factor Load Value	Item-Total Correlation
M12	.680	.641	M31	.744	.557
M13	.652	.685	M37	.777	.547
M14	.633	.727	M40	.702	.532
M16	.628	.486	M41	.757	.582
M30	.653	.472	M43	.688	.567
M33	.600	.425	M44	.752	.639
M24	.760	.582	M45	.769	.693
M25	.787	.625	M46	.739	.617
M27	.542	.421	M47	.697	.568
M29	.750	.567			

According to Table 8, it was determined that as a result of the exploratory factor analysis, the primary factor loads of the remaining items in the scale did not fall below .542 and the item-total correlations did not fall below .421. It is seen that the primary factor loading values of the items vary between .542 and .787. The item-total correlations vary between .421 and .727.

Table 9. Anti-image Correlation Values of OSCECT's Items

Item No.	Anti–Image Correlation	Item No.	Anti–Image Correlation
M12	.923	M31	.765
M13	.896	M37	.944
M14	.887	M40	.913
M16	.937	M41	.931
M30	.929	M43	.934
M33	.922	M44	.905
M24	.738	M45	.880
M25	.748	M46	.927
M27	.866	M47	.938
M29	.761		

According to Table 9; it was determined that the anti-image correlation values of the items varied between 0.738 and 0.944. This result shows that the contribution of the load values of the items to the factor structure is high.

The Scree Plot obtained because of the exploratory factor analysis and given in Figure 3 gives the impression that the scale has three factors.
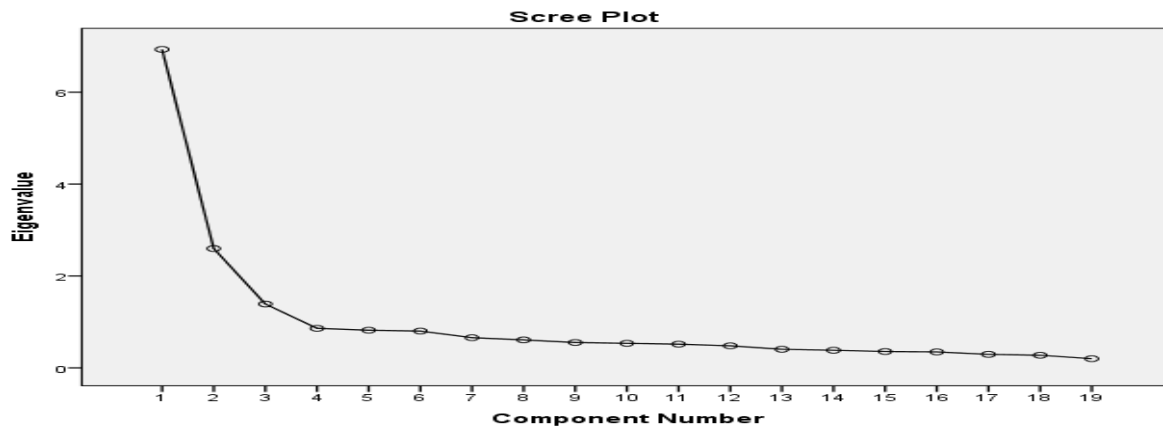

Figure 3. Scree Plot Chart Showing the Factor Count of OSCECT

In the figure, after the third factor, the graph shows that a flattening has started and continues. Accordingly, the graph gives the idea that the scale may consist of three factors. In exploratory factor analysis, the "Varimax" rotation method was applied to the data set to show whether there are sub-dimensions in the scale and if there are sub-dimensions, which items are gathered under which sub-dimensions (Büyüköztürk, 2003; Özdamar, 2013). The applied "Varimax" rotation results are shown in Table 9.

Table 10. For Pre-service teachers Factors Obtained from Varimax Rotation of OSCECT and Loads of Substances Underneath These Factors

	Factors			Cronbach Alpha Valu	Percentage of Variances Explained
	1	2	3		
M44	.754				
M45	.791				
M46	.752				
M37	.746			.906	20,026
M43	.734				
M47	.729				
M40	.678				
M41	.659				
M14		.834			
M13		.774			
M12		.745			
M16		.617		.836	17,750
M30		.561			
M33		.498			
M25			.787		
M24			.760		
M29			.749	.788	13,673
M31			.742		
M27			.449		

Variance Explained by Three Factors = %57.449
Cronbach Alpha = .875

According to the Table 10. the remaining items were placed under three factors. After these processes, it was seen that there were 19 items in the scale. The variance explained by the items under the first factor is % 20.026; The variance explained by the second factor is %17.750; the variance explained by the third factor. The total explained variance rate of the scale was %57.449, of which 13.673. The Cronbach–Alpha internal consistency coefficient of the first factor of the scale was .906; Cronbach–Alpha internal consistency coefficient of the second factor was .836; The Cronbach-Alpha internal consistency coefficient of the second factor was .788 and the Cronbach-Alpha internal consistency coefficient of the scale was .875. In this case, it can be said that all items have a high contribution to reliability (Özdamar, 2013).

Thus, the total score for the scale was obtained.

- Items 37, 40, 41, 43, 44, 45, 46 and 47 constitute a sub-dimension (first sub-dimension),

- Items 12, 13, 14, 16, 30 and 33 constitute a sub-dimension (second sub-dimension),

- It was determined that items 24, 25, 27, 29 and 31 constitute a sub-dimension (third sub-dimension).

For Pre-service teachers, the inventory was finalized because of the exploratory factor and reliability analysis performed on the OSCECT.

- Items 37, 40, 41, 43, 44, 45, 46 and 47 have been renumbered as items 1, 2, 3, 4, 5, 6, 7 and 8. The sub-dimension formed by these items, "*Characteristics of learners in the education pr*ocess",

- Items 12, 13, 14, 16, 30 and 33 have been renumbered as items 9, 10, 11, 12, 13 and 14. The sub-dimension created by these items is "*Awareness of implicit and established oppression, discrimination and inequality*".

- Items 24, 25, 27, 29 and 31 have been renumbered items 15, 16, 17, 18 and 19. The sub-dimension formed by these items was named as the sub-dimension of " *Awareness of deterministic curriculum***".**

Testing the Requirements of the IOCT for Pre-service Teachers for Confirmatory Factor Analysis of the Data Sets of OSPCT, OSDCT and OSCECT

OSPCT, which is the first scale of the inventory, confirmatory factor analysis was performed to determine whether the resulting structure was confirmed or not. Since confirmatory factor analysis is a parametric test, it is necessary to reveal whether the requirements are met. In this context, it was examined whether the requirements of normality, multivariate normality, linearity, extreme value and multicollinearity were met.

When the descriptive statistics of the study group were examined, skewness= -.263 and kurtosis= -.171 for OSPCT; The values of skewness= .281, kurtosis= -.573 for OSDCT, and skewness= -.198, kurtosis= .072 for OSCECT indicate that normality is achieved. To determine the extreme values, the total scores were converted into standardized z scores. Data exceeding -4 and +4 values were accepted as extreme values. Another study is to determine multidirectional extreme values. Mahalanobis distances were tested using Regression to determine multi-directional extreme values. Outliers exceeding the critical chi-square value were deleted from the resulting values.

It has also been examined whether there is a multicollinearity problem in the data pattern. In this context, variance increase factors (VIF), tolerance values for independent variables, and state condition index (CI) were examined. VIF values for OSPCT are 1.014 and 1.120; It can be said that there is no multicollinearity problem since it is between 1.542 and 1.426 for OSDCT and between 1.123 and 1.196 for OSCECT and these values are VIF<10. Tolerance values for independent variables are .875 and .941 for OSPCT; It was found between .705 and .802 for OSDCT and between .845 and .935 for OSCECT. The fact that these values are greater than .10 can be said to indicate that there is no multicollinearity problem. 11,337 and 12,564 for CI's OSPCT; 13.456 and 18.124 for OSDCT and 7.653 and 14.127 for OSCECT between them were determined. The fact that these values are less than 30 can be shown as another sign that there is no multicollinearity problem. To examine the multivariate normality and linearity, the matrices formed from the scatter diagram were examined. It has been revealed that the shapes of the diagrams in the matrix are close to the ellipse. On the other hand, linear, logarithmic, inverse, quadratic and cubic values of variable distributions were examined. High linearity scores among these values can be seen as another proof. These values show that confirmatory factor analysis can be performed on data sets.

Confirmatory Factor Analysis Results of OSPCT, OSDCT, and OSCECT for Pre-service Teachers

Confirmatory factor analysis was performed by applying the developed scale to different samples. Figures 5, 6 and 7 show the models resulting from Confirmatory Factor Analysis.
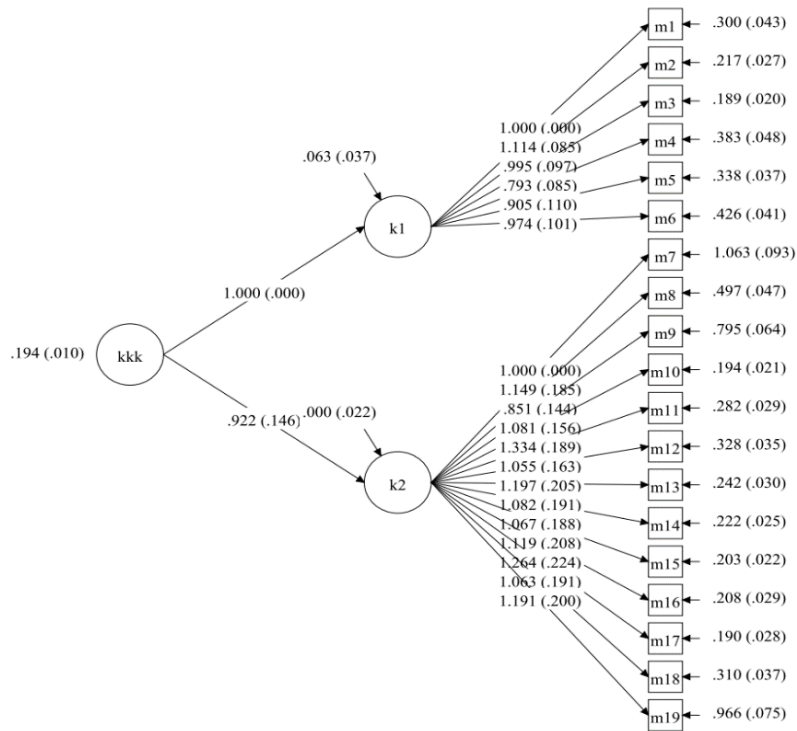
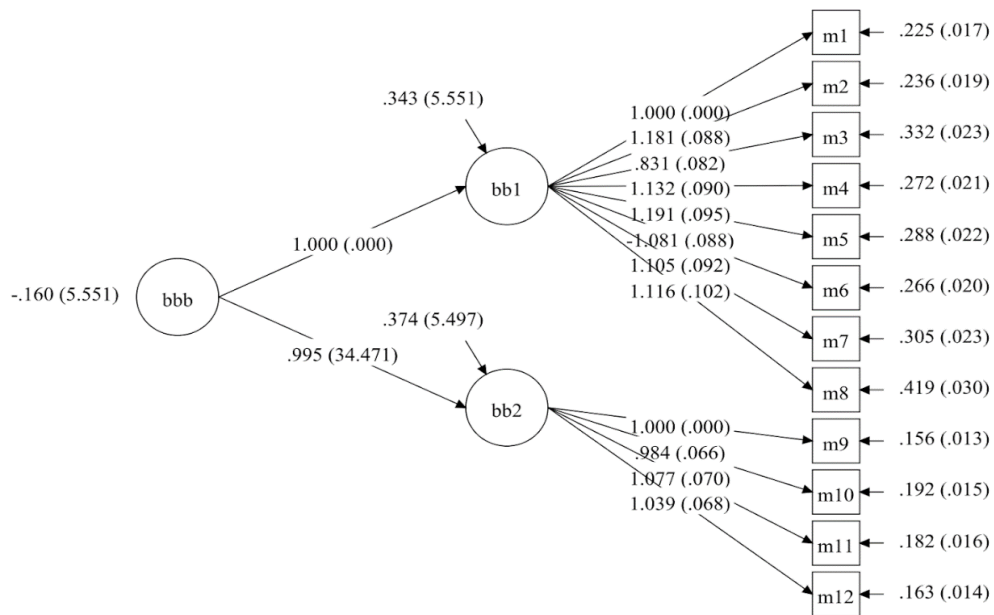**Figure 4. Confirmatory Factor Analysis Model of OSPCT for Pre-service Teachers**

Figure 5. Confirmatory Factor Analysis Model of OSDCT for Pre-Service Teachers
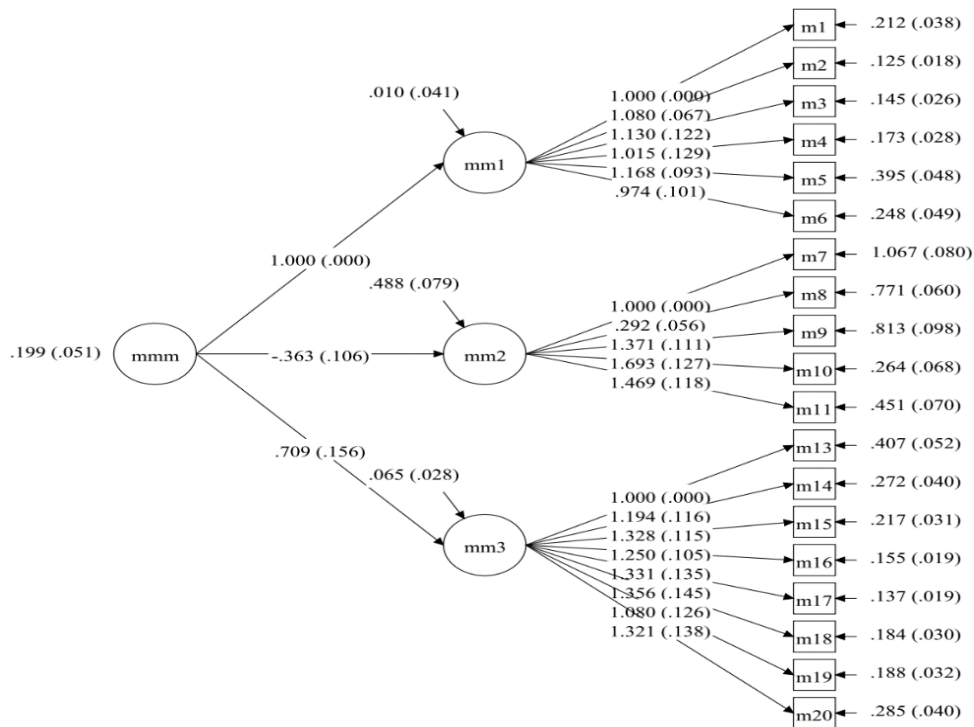
Figure 6. Confirmatory Factor Analysis Model for OSCECT for Pre-Service Teachers

According to the Figure 4, it is seen that the Chi-square and degrees of freedom values obtained because of CFA for OSPCT are $\chi2=428.812$, (sd=150, p<.01) and a ratio of $\chi2/sd=$ 2.86 was obtained. When Figure 5 is examined, it is seen that the Chi-square and degrees of freedom values obtained because of CFA for OSCECT are $\chi2=198.270$, (sd=52, p<.01) and the ratio is $\chi2/sd=$ 3.81. When Figure 6 is examined, it is seen that the Chi-square and degrees of freedom values obtained because of CFA for OSCECT are $\chi2=389.323$, (sd=149, p<.01) and a ratio of $\chi2/sd=2.61$ was obtained.

The fact that these ratios are below 4 indicates an acceptable fit (Jöreskog and Sörbom, 1993; Sümer, 2000; Kline, 2005). In this study, it can be said that the fit between the model obtained as a result of CFA and the data is acceptable.

The fit values obtained because of CFA are summarized in Table 11.

Table 11. Fit İndices Obtained as a result of CFA.

	χ^2	h_d	χ^2/s_d	RMSEA	SRMR	TLI	CFI
OSPCT	428.812	150	22.86	.064	.059	.855	.872
OSDCT	198.270	52	3.81	.079	.042	.917	.935
OSCECT	389.323	149	2.61	.060	.086	.888	.903

It can be said that one of the most used indices of lack of fit in CFA is RMSEA. The fact that the RMSEA index is .05 and less than this value is an indicator of model-data fit; however, it is stated that this value can be accepted up to .08 (Browne& Cudeck, 1993; Hu & Bentler, 1999; Şimşek, 2007; Vieira, 2011). The RMSEA value in this study was .064 for OSPCT; The values of .079 for OSDCT and .060 for OSCECT can be accepted as an indicator of fit for these models.

It can be said that the SRMR value lower than "0.08" in CFA (Şimşek, 2007) is acceptable for the model to be compatible with the real data. As a result of CFA, the concordance values for OSPCT were SRMR= .059; SRMR= .042 for OSDCT and SRMR= .086 for OSCECT. According to these results, it can be said that the data fit of the models is acceptable.

TLI and CFI values of .95 and above in DFA indicate that model data fit corresponds to "perfect fit", CFI values close to .90 (Hu & Bentler, 1998) and TLI values above .85 (Doğan, 2013). It is an indicator that it is acceptable (Bentler, 1990; Sümer, 2000; Şimşek, 2007). As a result of the analysis, TLI= .855, CFI= .872 for OSPCT; TLI=.917, CFI=.935 for OSDCT and TLI=.888, CFI=.903 for OSCECT. According to these results, it can be said that the data fit of the models is acceptable.

The main purpose of CFA is to show the level of fit of a defined model with the data obtained (Sümbüloğlu & Akdağ, 2009). In this context, it can be said that the two-dimensional structure of OSPCT and OSDCT and the three-dimensional structure of OSCECT are acceptable according to the fit statistics obtained from confirmatory factor analysis.

CONCLUSION AND DISCUSSION

In this study, a measurement tool was developed to determine the orientations of pre-service teachers regarding curriculum theories. A new culture-specific measurement tool has been developed that can contribute to the teacher training process. The IOCT for prospective teachers consists of three scales: OSPCT, OSDCT and OSCECT. OSPCT for pre-service teachers consists of 19 items, OSDCT for pre-service teachers consists of 12 items and OSCECT for pre-service teachers consists of 19 items. The highest score that can be obtained from OSPCT for pre-service teachers is 95, and the lowest is 19. The highest score that can be obtained from OSDCT for pre-service teachers is 60 and the lowest is 12; The highest score that can be obtained from the OSCECT for pre-service teachers is 95 and the lowest is 19. All three scales are evaluated within themselves. Thus, it can be determined to what extent a teacher has a prescriptive, descriptive, or critical-explanatory curriculum orientation.

The reason why Marsh and Willis (2003) classification for curriculum specialists/theorists was used in this study is that this classification is thought to have a stronger distinction. This inventory was carried out on pre-service teachers who took the Curriculum course. Therefore, having taken the Curriculum course during the application process of the inventory should be accepted as a criterion. This is because, for the development of an orientation towards curriculum theories, pre-service teachers need to have experienced the concept of curriculum for at least one semester.

When the Turkish literature is examined, it is seen that Eren (2010) adapted the "Educational Programs Orientation Inventory" to Turkish culture through teacher candidates. This inventory, which was later adapted to Turkish culture, was used in the sample of pre-service teachers by Bay, Gündoğdu, Ozan, Dilekçi & Özdemir (2012), Tanrıverdi & Apak (2014), Yeşilyurt (2012), Abakay, Şebin & Şahin (2013), Eren & Çetin (2018) and Şahin (2020). It is noteworthy that in research conducted in Turkey, a measurement tool developed on a sample of teachers, whose structure varies in different cultures, is used in the sample of teacher candidates.

In the studies conducted in the field of education in Turkey, it is seen that the samples generally concentrate on the pre-service teachers studying at the faculties of education. For this reason, a measurement tool has been developed to determine the orientations of pre-service teachers regarding curriculum theory in Turkey.

It has been revealed that the structure and items of the scales in the IOCT developed for pre-service teachers differ from the structure and items of the scales in the IOCT developed for teachers by Türe (2023) and Türe & Bıkmaz (2023). Because there are structural differences between the teacher sample and the undergraduate student sample. Faculty of Education undergraduate students are individuals who continue to be trained with the aim of training teachers. On the other hand, the participants of the sample in which the scale could be developed and applied were selected from third and fourth-year undergraduate students who had completed the course on "Curriculum". Due to the structural differences of the participants, the IOCT for Pre-service teachers, the sample of which was undergraduate students of the Faculty of Education. For this reason, the item pool of the scales in the inventory was prepared again.

As a result of the analysis conducted on the data collected from the undergraduate student sample, it was reported that the number of factors of the scales and the number of items in the factors changed. Therefore, IOCT was developed for teachers by Türe (2023) and Türe & Bıkmaz (2023) has one-dimensional structure of OSPCT and OSDCT and the three-dimensional structure of OSCECT. But in this study, IOCT was developed for per-service teachers by researcher has the two-dimensional structure of OSPCT and OSDCT and the three-dimensional structure of OSCECT. Therefore, the importance of creating a new scale specifically tailored to pre-service teachers can be emphasized.

Conflicts of Interest: No potential conflict of interest was declared by the authors.

Funding Details: The authors did not receive any funding or financial support for the research, authorship, and/or publication of this article.

CRediT Author Statement: The author confirms sole responsibility for the following: study conception and design, data collection, analysis and interpretation of results, and manuscript preparation.

Ethical Statement: It was accepted with the decision numbered 11/17 taken at the session numbered 11, dated 30 November 2022, of the EBYU Human Research Educational Sciences Ethics Committee.

REFERENCES

Abakay, U., Şebin, K. ve Şahin, M.Y. (2013). Curriculum Orientation of Pre-Service Physical Education Teachers. *Life Sci J, 10* (3): 2161-2166.

Bay E, Gündoğdu K, Ozan C, Dilekçi D. ve Özdemir D., (2012). İlköğretim Öğretmen Adaylarının Program Yaklaşımlarının Analizi. *Uluslararası Eğitim Programları ve Öğretim Çalışmaları Dergisi; 2*(3), 15-28.

Brown, G. T. L., Lake, R. and Matters, G. (2011). New Zealand and Queensland teachers' conceptions of curriculum: Potential jurisdictional effects of curriculum policy and implementation. *Curriculum Perspectives, 31*(3), 33-48.

Büyüköztürk, Ş. (2003). Sosyal *bilimler için veri analizi el kitabı istatistik, araştırma deseni spss uygulamaları ve yorum*, Ankara: PegemA Yayıncılık.

Chant, R. H. (2002). The impact of personal theorizing on beginning teaching: Experiences of three social studies teachers. *Theory and Research in Social Education, 30* (4), 516-540.

Cheung, D. (2000). Measuring teachers' meta-orientations to curriculum: application of hierarchical confirmatory factor analysis. *Journal of Experimental Education, 68*, 149–165.

Cheung, D. and Ng, P. H. (2000). Science teachers' beliefs about curriculum design. *Research in Science Education* (30), 357–75.

Cheung, D. ve Wong, H. W. (2002). Measuring teacher beliefs about alternative curriculum designs. *Curriculum Journal, 13* (2), 225–248.

Clark, M. C. ve Peterson, P. L. (1986). *Teachers' thought processes*. In M. C. Wittrock (Ed.), Handbook of research on teaching (255-298). New York: Macmillan

Cornett, J. W. (1990). Teacher thinking about curriculum and instruction: A casestudy of a secondarysocialstudiesteacher. *Theory and Research in Social Education*, *18* (3), 248-273.

Crummey, M. (2007). Curriculum orientations of alternative education teachers. University of Kansas. ProQuest Dissertations and Theses, Retrieved from http://search.proquest.com/docview/-304860138?accountid=8403

Dommoyer, R. (1989). Theory, practice and the double-edged problem of idiosyncrasy. *Journal of Curriculum and Supervision, 4,* 257-270.

Eren, A., (2010). Öğretmen adaylarının program inançlarının görünüm analizi. *Kastamonu Eğitim Dergisi, 18*(2), 379-388.

Erkuş, A. (2011). *Davranış bilimleri için bilimsel araştırma süreci*. Ankara: Seçkin Yayıncılık.

Harste, J., Leland, C., Schmidt, K., Vasquez, V. and Ociepka, A. (2002). Practice makes practice, or does it? The relationship between theory and practice in teacher education.(An educology of teacher education.). *International Journal of Educology, 16*, (2), 116-191.

Hasweh, M. Z. (2003). Teacher accommodative change. *Teaching and Teacher Education*, *19*, 421-434.

Henson, K. (1995*). Curriculum development for education reform*. New York: Harper Collins College.

Hu L. T. and Bentler P.M. (1999). Cut off criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, (6)*1, 1-55

Jackson, P. W. (1992). Conceptions of Curriculum and Curriculum Specialists in: P.W.Jackson, (Ed.) *Handbook of Research on Curriculum: A project of the American Educational Research Association,* Part 1, Macmillan: New York.

Jenkins, S. B. (2009). Measuring teacher beliefs about curriculum orientations using the modified-curriculum orientations inventory. *Curriculum Journal, 2* (20), 103-120.

Klein, F. (1992). A Perspective on the gap between curriculum theory and practice. *Theory Into Practice, 31* (3), 191-197.

Killion, J. P. and Guy R. T. (1991). A process for personal theory building. *Educational Leadership*, *48* (6), 14-16.

Macdonald, J. B. (1971). Curriculum theory. *The Journal of Educational Research, 64,* 196-200.

Marsh, J. C. and Willis, G. (2003). *Curriculum: Alternative approaches, ongoing issues*. Prentice Hall: New Jersey.

McNeil, J. D. (1977). *Curriculum: A comprehensive introduction*. New York, NY: Harper-Collins.

McCutcheon, G. (1985). Curriculum theory/curiculum practice: A gap or the Grand Canyon? In A. Molnar (Ed.), *Curent thought on curiculum* (45-52). Alexandria, VA.

Miller, D. L. (2011). Curriculum theory and practice: What's your style? *Phi Delta Kapan, 92*, 32-39.

Ornstein, A. C. and Hunkins, F. P. (1998). *Curriculum: Foundation, principles, and issues*. Pearson Education Inc.: Boston

Özdamar, K. (2013*). Paket programlar ile istatistiksel veri analizi* (9. Baskı). Nisan Kitabevi: Eskişehir.

Pajares, M. F. (1992). Teachers' beliefs and educational research: Cleaning up a messy pro-duct. *Review of Educational Research, 62*, (3), 307-332.

Peacock, M. (2001). Pre-service ESL teachers" beliefs about second language learning: A longitudinal study. *System, 29* (2), 177-195.

Peercy, M. M. (2012). Problematizing the theory-practice gap: How ESL teachers make sense of their preservice education. *Journal of Theory and Practice in Education, 8* (1), 20-40.

Reding, C. (2008). *Curricular orientations of catholic school teachers and administrators.* University of Kansas. ProQuest Dissertations and Theses, Retrieved from http://search.proquest.com/docview/-304616634?accountid=8403

Rice, S., & Mahlios, M.C., (2004). Teachers' Views of Curriculum Orientations: The Hedgehog V. the Fox. Paper presented at the American Educational Studies Association Annual Meeting. Kansas City

Stipek, D. J., Givvin, K. B., Salmon, J. M. and MacGyvers, V. L. (2001). Teachers beliefs and practices related to mathematics instruction. *Teaching and Teacher Education*, *7* (2), 213-226.

Sümbüloğlu K. ve Akdağ B. (2009). *İleri biyoistatistiksel yöntemler*. Ankara: Hatipoğlu

Sümer, N. (2000). Yapısal eşitlik modelleri: Temel kavramlar ve örnek uygulamalar. *Türk Psikoloji Yazıları, (3)*6, 49-73

Şimşek, Ö.F. (2007). *Yapısal eşitlik modellemesine giriş: Temel ilkeler ve LISREL uygulamaları.* İstanbul: Ekinoks Yayınları

Tanrıverdi, B. ve Apak, Ö. (2014).Pre-service teachers' beliefs about curriculum orientations. *Procedia - Social and Behavioral Sciences,* 116, 842 – 848.

Türe, E. (2017). *Öğretmenlerin eğitim programı teorilerine ilişkin yönelimleri ve öğrenme-öğretme sürecine yansımaları*. (Unpublished doctorate dissertation). Ankara Üniversitesi, Ankara, Türkiye.

Ture, E. & Bikmaz, F. (2023). Development Study of The Inventory of Orientations in Curriculum Theories (IOCT) (From Qualitative Cluster Analysis to Quantitative Confirmatory Factor Analysis). *Educational Policy Analysis and Strategic Research, 18*(2), 107-132. doi: 10.29329/epasr.2023.548.6

Vallance, E. (1982). The practical uses of curriculum theory. *Theory into Practice, 21* (1), 4-10.

Vieira A.L. (2011). *Preparation of the analysis. Interactive LISREL in practice*. London: Springer

Yeşilyurt, E. (2013). Program Geliştirme Dersinin Öğretmen Adaylarının Program Geliştirmeye İlişkin Bilişsel Farkındalık Düzeyine Etkisi. *Kuramsal Eğitimbilim Dergisi*, 6 (3), 316-342.