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Research Article

Development of Pamukkale Piano Learning Style Scale

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Abstract: In musical instrument training, piano has been taught as a compulsory instrument in all departments of Music Education. It is thought that as a major instrument, piano plays a crucial role in music education. Without question, it is highly vital to raise individuals' awareness of learning styles towards learning piano in effort to practice piano courses more efficiently and effectively. In this respect, the present study is of utmost importance as it will be a pioneer study and make a great deal of contributions to the relevant field. The current study was designed to develop a valid and reliable scale. The population of the study consisted of 170 music teacher candidates majoring in Music Education, including those who already took piano lessons. Although the study successfully accessed to the whole sample, only 133 scales were included to the research, due to inaccurate or incomplete data in subjects' responses. To test the construct validity of the scale, explanatory factor analysis (EFA) and confirmatory factor analysis (CFA) were used. The original scale consists of four sub-dimensions, namely, independent, analytical, dependent and affective learning styles.

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KEYWORDS

Learning,
Learning styles,
Individual Differences,
Piano training

1. INTRODUCTION

Individuals living in an age of information are compelled to learn on their own to achieve key elements of learning such as information, skill, attitude and understanding as these learning elements increase and change day by day. In such an age of information in which the information is easily distributed along with the easy access to information, learning and teaching processes should leverage students' individual developments and allow them to adapt innovations. In this context, individual differences should not be ignored and we should strive to find out each student's learning styles and help them to set up a learning infrastructure in their learning process. Today, in modern day education, there is a known fact that what's important is not what a teacher teaches, but how and to what extent a student can learn. An efficient and effective learning will only be achieved as long as such sense of education is adopted. Erden & Akman (2002) highlighted that the one of the critical aspects distinguishing humans from other living creatures is their learning capacity. As biological

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creatures, humans learn several behaviours in a short time. Firstly, new born humans consciously start to smile to everyone, to learn, to walk and to speak. Then, humans learn to wear, to play with their friends, to read, to write, to play football. Each of them has its own process and each behaviour exhibited in this process is a learned behaviour.

Students are those who achieve learning and all kinds of students' personality traits influence their learning process positively or adversely. Neuropsychological, psychological and physiological aspects of students will shape their future of learning process. Thus, the concept of individual differences becomes prominent. According to Süral (2008); Ryan, (1974); Kulik, (1974); Swanson & Denton (1977), several studies were conducted to investigate how effective individualized teaching was. In previous studies, academic achievements of students who attended courses using direct and critical instruction methods were compared with those of students learning in an individualized teaching system. In this respect, the results revealed that students learning through individualized teaching methods exhibited a high success (Senemoğlu, 2003).

Individualized teaching is a method of teaching in which students do not perform under time pressure; pace of learning is based upon each learner's interest and abilities; individual learning tools, instruments and warning options are delivered to students pertaining to their learning styles; and a continuous feedback is presented to keep students updated about their learning improvements (Tandoğan, 2002).

The concept of individual differences refers to various individual aspects. The very first aspects that come to mind are intelligence, ability and skills, personality traits and learning styles. Individual differences have drawn for many years the attention of the researchers. Educationalists felt the need to explain individual differences. While the concept of individual differences encouraged educationalists to further carry out theoretical studies, individual differences were often neglected in practice. Yet, the fact that each person has a unique character should be considered (Aydoğdu & Kesercioğlu, 2005). As it is known, there is no fixed standard for learning information in the same way. Individuals' learning styles also are different from each other, which should not be ignored and learning environments should be arranged and diversified in this sense. If teaching is performed in such an environment, it will not only contribute to students' academic success but also strengthen their attention span in the learning process. Thus, it is highly vital to identify students' learning styles to achieve these goals. Both teachers and students should be aware of learning styles.

Each person learns in a different way. Each individual is inclined to adopt natural, easy and comfortable learning styles for themselves like the same way they do when they prefer their hairstyles, clothes and food choices. These learning styles allow individualists to effectively access to information with minimum energy and time. Thus, each individual has their own learning styles. As it is an inborn ability, it influences every moment and dimension of human behaviours through their life (Aydoğdu & Kesercioğlu, 2005). Learning style is related to student's individual aspects and preferences. Whereas each individual has unique learning style, they also react to learning. A sense of education in harmony with a student's psychology and environment is the best learning environment for a student (Şimşek, 2007).

Several studies were conducted in the field (Altun, Yurga, Zahal, Gürpınar, 2015; Arslan & Babadoğan, 2005; Aşkar & Akkoyunlu, 1993; Babacan, 2010; Baş & Beyhan, 2013; Bozkurt & Aydoğdu, 2009; Demirtaş, 2017; Duman, 2008; Deniz, 2011; Gencel, 2007; Hasırcı, 2006; Kaleli-Yılmaz, Koparan,; Hancı, 2016; Kaya, Bozaslan, Durdukoca, 2012; Kulaç, Sezik, Aşcı, Gürpınar, 2015; Koçak, 2007; Kolb & Kolb, 2005; Kurtuldu & Aksu, 2015; Okay, 2012; Pehlivan, 2010; Süral, 2008; Sarıtaş & Süral, 2010; Şimşek, 2007; Zahal, 2014;) and many researchers developed learning style models. However, previous studies showed that existing learning styles was based on cognitive success of students or they were

developed to identify individual differences in a general sense. The current study examined learning styles from a different point of view and aimed to find out to what extend learning styles of students talented in art activities were shaped. In this sense, the purpose of the study was to identify learning styles of those individuals talented in playing piano.

As stressed by Say (2001), we can understand piano is important and necessary in music education as a branch of art education. In the phase of musical instrument training, piano has been taught as a compulsory instrument in all departments of Music Education. It is thought that as a major instrument, piano plays a crucial role in music education. Besides, piano is one of the most common instruments used in typical, private and vocational music training. Piano is commonly used because of its high technical capacity, polyphonic feature and broad repertoire (Ömür & Gültek, 2013). As clearly seen, piano will be in the centre of education for an individual who aims to attend fine arts education. Without question, it is highly vital to raise individuals' awareness of learning styles towards learning piano in effort to practice piano courses more efficiently and effectively. In this respect, Pamukkale Piano Learning Styles Model was developed by Demirtaş & Süral to fill the gap in the field.

2. METHOD

The present study was designed to develop a valid and reliable scale.

2.1. Study Group

The population used in this study consisted of 170 music teacher candidates majoring in Music Education, including those who already took piano lessons. Although the study successfully accessed to the whole sample, only 133 scales were included to the research, due to inaccurate or incomplete data in students' responses.

2.2. Data Gathering Instrument

After review of the relevant literature, the scale developed by Karasar (2002) ve Balcı (1995) was selected to use. Accordingly, the following stages were tracked:

1. Pool of Items
2. Expert Opinion
3. Item Analysis
4. Construct Validity of Learning Style Scale
5. Determination of Reliability

The stages mentioned above were outlined as follows:

***Pool of Items*:** In the early stage of scale development process, the following open-ended question was asked of students concerning their thoughts: "What have been your experiences in learning the piano since polyphonic instruments were introduced to you?". The research was administrated to 3rd grade students majoring in Music Education at the Pamukkale University, Faculty of Education, Department of Fine Arts Education.

Item Analysis: The collected compositions were closely reviewed and similar statements were selected. After analysing the statements, scale items were formed and four different learning styles were identified. Afterwards, the scale was called as "Pamukkale Piano Learning Styles Scale (PPLSS)". This study is only applicable to high school and university students due to the sampling group and item content.

Expert Opinion: Experts were consulted to review the item pool. Accordingly, draft scale items were finalized.

Construct Validity of Learning Style Scale: In order to test construct validity of the learning style scale, factor analysis was performed. "Plenty of measurable and observable questions were prepared in an effort to measure psychological aspects of individuals such as

attitude, motive, performance and ability. The question of to what extent scale items measure above-mentioned psychological aspects is related to construct validity" (Büyüköztürk, 2015). Then, the remaining questions were applied to Pamukkale University students in a pilot study. Validity level of the scale were analysed through this pilot study. Therefore, construct validity analysis was carried out via factor analysis technique. After running the factor analysis, four learning styles were determined; 25 out of 55 items were excluded and the original 30 item scale was developed.

Given the scale items measuring learning style, items measuring independent, analytical, dependent and affective learning styles are 1-5-9-13-17-21-25-29, 2-6-10-14-18-22-26, 3-7-11-15-19-23-27-30 and 4-8-12-16-20-24-28, respectively.

Table 1. Reliability Coefficients of the Scale and its sub-dimensions

Factors	Cronbach's Alpha Values
Independent Learning Style	.792
Analytical Learning Style	.792
Dependent Learning Style	.758
Affective Learning Style	.646
Overall	.773

Given the scales are to be used, the level of reliability for preliminary test is expected to be 0.60 as it is 0.80 for fundamental studies. On the other hand, reliability level for practical studies should range between 0.90 and 0.95 (Şencan, 2005). While reliability confidents vary according to types of research in social sciences, reliability confidents for scientific studies are expected to be 0.70 and the level of 0,85 is expected for studies based on ability, interest and skill (Şencan, 2005). All scale items were included and Cronbach's Alpha reliability coefficient of the scale was found to be .773.

2.3. Data Analysis

Initially, draft scale items were transferred into the computer environment according to 133 teacher candidates' responses. The score of each item and the total survey score were calculated. Explanatory factor analysis (EFA) was utilized to test construct validity of the scale and Confirmatory Factor Analysis (CFA) were carried out to evaluate fit indices of the factors obtained. The suitability of the data for factor analysis was determined by running the Kaiser-Meyer-Olkin (KMO) and Bartlett's tests.

3. FINDINGS

Initially, factor analysis was performed using anti-image correlation matrix. The diagonal of anti-image correlation matrix should be greater than .50 (Can, 2014). Items showing a correlation of less than .50 were removed from the survey. The remaining items were subjected to factor analysis. In light of the anti-image correlation matrix results, the diagonal values presented in Table 2 vary between .554 (4th item) and .942 (2nd item).

Table 2. Anti-Image Correlation Matrix

M18	M17	M16	M15	M14	M13	M12	M11	M10	M9	M8	M7	M6	M5	M4	M3	M2	M1	
-,106	,112	-,104	,072	-,035	-,275	,005	,137	-,115	-,001	-,068	-,061	-,124	-,070	,291	-,123	-,459	**,841[a]**	Item 1
,114	-,318	,096	-,112	-,084	,032	,072	,019	-,156	-,215	-,077	-,074	,046	,066	-,084	-,214	**,942[a]**	-,459	Item 2
-,060	,068	-,026	,008	-,153	-,048	-,114	,107	,331	-,111	-,229	,216	-,184	,102	-,375	**,762[a]**	-,214	-,123	Item 3
-,024	-,152	,129	-,171	,071	-,211	-,002	,156	-,404	,034	,349	-,338	,312	-,272	**,554[a]**	-,375	-,084	,291	Item 4
-,181	,014	,141	,050	-,025	,078	,383	-,295	,059	-,205	-,087	-,283	-,019	**,746[a]**	-,272	,102	,066	-,070	Item 5
,020	-,061	-,001	,160	,093	-,041	,206	-,073	-,125	-,192	,020	,037	**,887[a]**	-,019	,312	-,184	,046	-,124	Item 6
,146	,180	-,267	,232	-,044	,066	-,089	-,004	-,027	,027	-,131	**,766[a]**	,037	-,283	-,338	,216	-,074	-,061	Item 7
,080	-,106	,207	-,184	,020	,051	-,129	,040	-,115	-,205	**,881[a]**	-,131	,020	-,087	,349	-,229	-,077	-,068	Item 8
,014	,236	-,087	-,285	-,059	-,300	-,231	,110	-,064	**,897[a]**	-,205	,027	-,192	-,205	,034	-,111	-,215	-,001	Item 9
-,054	,031	-,047	,120	,029	,185	-,067	-,450	**,643[a]**	-,064	-,115	-,027	-,125	,059	-,404	,331	-,156	-,115	Item 10
,060	-,064	,006	-,214	-,013	-,341	-,198	**,590[a]**	-,450	,110	,040	-,004	-,073	-,295	,156	,107	,019	,137	Item 11
,134	-,264	,232	,292	-,285	-,029	**,774[a]**	-,198	-,067	-,231	-,129	-,089	,206	,383	-,002	-,114	,072	,005	Item 12
-,028	-,189	,014	,136	,183	**,869[a]**	-,029	-,341	,185	-,300	,051	,066	-,041	,078	-,211	-,048	,032	-,275	Item 13
-,318	,275	-,272	-,070	**,794[a]**	,183	-,285	-,013	,029	-,059	,020	-,044	,093	-,025	,071	-,153	-,084	-,035	Item 14
,064	-,060	-,422	**,657[a]**	-,070	,136	,292	-,214	,120	-,285	-,184	,232	,160	,050	-,171	,008	-,112	,072	Item 15
-,138	-,230	**,598[a]**	-,422	-,272	,014	,232	,006	-,047	-,087	,207	-,267	-,001	,141	,129	-,026	,096	-,104	Item 16
-,281	**,816[a]**	-,230	-,060	,275	-,189	-,264	-,064	,031	,236	-,106	,180	-,061	,014	-,152	,068	-,318	,112	Item 17
,740[a]	-,281	-,138	,064	-,318	-,028	,134	,060	-,054	,014	,080	,146	,020	-,181	-,024	-,060	,114	-,106	Item 18
-,028	,110	-,239	-,073	,033	-,050	-,130	,062	-,206	,176	-,049	-,060	-,230	,002	-,113	,036	-,005	,139	Item 19
,016	-,078	,123	-,270	,051	-,149	-,166	,284	-,423	-,003	,128	-,063	,030	-,274	,210	-,316	,359	-,088	Item 20
-,344	-,020	,171	-,248	-,103	-,206	-,147	-,031	,056	,082	,175	-,182	-,051	-,028	,087	,003	,028	,000	Item 21
,155	-,114	-,001	,139	-,054	,002	,128	,001	-,132	-,172	-,106	-,009	-,092	,104	,044	-,166	,000	,054	Item 22
-,100	,016	-,106	-,128	,124	-,039	-,345	,159	,120	,091	,118	,006	-,038	-,212	,051	,202	-,149	,012	Item 23
-,026	-,285	-,184	,232	,160	-,285	-,184	,232	,160	-,130	,062	-,206	,176	,359	-,005	,114	-,318	,096	Item 24
,129	-,087	,207	-,267	-,001	-,087	,207	-,267	-,001	-,166	,284	-,423	-,003	-,316	,036	-,060	,068	-,026	Item 25
,141	,236	-,106	,180	-,061	,236	-,106	,180	-,061	-,147	-,031	,056	,082	,210	-,113	-,024	-,152	,129	Item 26
-,001	,014	,080	,146	,020	,014	,080	,146	,020	,128	,001	-,132	-,172	-,274	,002	-,181	,014	,141	Item 27
-,267	,176	-,049	-,060	-,230	,176	-,049	-,060	-,230	-,345	,159	,120	,091	,030	-,230	,020	-,061	-,001	Item 28
,207	-,003	,128	-,063	,030	-,003	,128	-,063	,030	-,130	,062	-,206	,176	-,063	-,060	,146	,180	-,267	Item 29
-,087	,082	,175	-,182	-,051	,082	,175	-,182	-,051	-,166	,284	-,423	-,003	,128	-,063	,180	-,061	,014	Item 30

M30	M29	M28	M27	M26	M25	M24	M23	M22	M21	M20	M19
,032	,040	-,004	-,073	-,295	,156	,054	,012	,054	,000	-,088	,139
-,084	-,129	-,089	,206	,383	-,002	,000	-,149	,000	,028	,359	-,005
-,112	,051	,066	-,041	,078	-,211	-,166	,202	-,166	,003	-,316	,036
,096	,020	-,044	,093	-,025	,071	,044	,051	,044	,087	,210	-,113
-,318	-,184	,232	,160	,050	-,171	,104	-,212	,104	-,028	-,274	,002
,114	,207	-,267	-,001	,141	,129	-,092	-,038	-,092	-,051	,030	-,230
-,005	-,106	,180	-,061	,014	-,152	-,009	,006	-,009	-,182	-,063	-,060
,359	,080	,146	,020	-,181	-,024	-,106	,118	-,106	,175	,128	-,049
,028	-,049	-,060	-,230	,002	-,113	-,172	,091	-,172	,082	-,003	,176
,000	,128	-,063	,030	-,274	,210	-,132	,120	-,132	,056	-,423	-,206
-,149	,175	-,182	-,051	-,028	,087	,001	,159	,001	-,031	,284	,062
-,124	-,106	-,009	-,092	,104	,044	,128	-,345	,128	-,147	-,166	-,130
-,088	,139	-,106	,112	-,104	,072	,002	-,039	,002	-,206	-,149	-,050
,359	-,005	,114	-,318	,096	-,112	-,054	,124	-,054	-,103	,051	,033
-,316	,036	-,060	,068	-,026	,008	,139	-,128	,139	-,248	-,270	-,073
,210	-,113	-,024	-,152	,129	-,171	-,001	-,106	-,001	,171	,123	-,239
-,274	,002	-,181	,014	,141	,050	-,114	,016	-,114	-,020	-,078	,110
,030	-,230	,020	-,061	-,001	,160	,155	-,100	,155	-,344	,016	-,028
-,063	-,060	,146	,180	-,267	,232	-,279	,255	-,279	,154	-,059	**,686[a]**
,128	-,049	,080	-,106	,207	-,184	,142	-,073	,142	,023	**,727[a]**	-,059
-,003	,176	,014	,236	-,087	-,285	-,365	,104	-,365	**,853[a]**	,023	,154
-,423	-,206	-,054	,031	-,047	,120	,417	-,711	**,837[a]**	-,365	,142	-,279
,284	,062	,060	-,064	,006	-,214	-,051	**,812[a]**	-,711	,104	-,073	,255
-,009	-,182	-,063	-,060	,146	,180	**,789[a]**	-,115	-,316	,036	-,060	,068
-,054	-,103	,051	,033	,020	**,814[a]**	-,168	-,156	,210	-,113	-,024	-,152
-,009	-,092	,104	,044	**,652[a]**	-,073	-,073	,331	-,274	,002	-,181	,014
-,073	-,295	,156	**,585[a]**	,255	-,100	,016	-,404	,030	-,230	,020	-,061
-,212	,104	**,714[a]**	,036	-,060	,068	-,026	,059	-,063	-,060	,146	,180
-,357	**,625[a]**	-,038	-,092	-,051	,030	-,230	-,125	,128	-,049	,080	-,106
,811[a]	,129	-,087	,207	-,267	-,001	-,087	-,027	-,003	,176	,014	,236

3.1. Construct Validity of the Measurement Tool (Explanatory Factor Analysis)

The suitability of the data for analysis and sampling adequacy was determined by utilizing the Kaiser-Meyer-Olkin (KMO) test. The result of our KMO testis .684 and this value shows that the magnitude of the sample can be characterized as " excellent" for factor analysis and sample adequacy is very high (Kalaycı, 2010; Şencan, 2005; Tavşancıl, 2006;). On the other hand, the results of Bartlett's test indicate that the chi square value (χ^2= 1357.200 ($p< .01$) was significant. In conclusion, the correlation between variables is high. The test results are presented in Table 3.

Table 3. *Kaiser-Meyer-Olkin Test Results*

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.684
Bartlett's Test of Sphericity	Approx. Chi-Square	1357.200
	Degrees of freedom(df)	435
	Sig.	.000

The Varimax rotation technique was performed and items with factor loadings less than .40, items taking place in more than one factor and small items with factor loadings less than 0.10 were extracted from the scale. Yavuz (2005), Bütüner & Gür (2007) proposed that scale

items should not be take place in more than one factor, the criteria for ideal value regarding the difference between the factor loadings should be at least 0.10 and items with factor loadings less than 0.10 should be called as similar items.

Table 4. Factor Loadings of Pamukkale Learning Style Scale

ITEMS	Factors			
	1	2	3	4
Item55	.725			
Item21	.711			
Item29	.642			
Item18	.629			
Item26	.603			
Item53	.573			
Item43	.542			
Item10	.515			
Item7		.750		
Item36		.729		
Item19		.661		
Item39		.641		
Item38		.629		
Item23		.470		
Item15		.420		
Item1		.420		
Item50			.726	
Item52			.716	
Item48			.716	
Item37			.680	
Item2			.637	
Item46			.626	
Item22			.433	
Item32				.742
Item12				.654
Item16				.631
Item28				.583
Item20				.557
Item17				.503
Item47				.422

As the absolute value below was determined as 0.40, values less than .40 was suppressed in items sorted by descending. For this reason, factor loadings given in Table 4 refer to only those factor loadings more than 0.40" (Can, 2014). Factor loadings were determined as 0.40 to make scale items more qualified and distinctive.

Table 5. Eigenvalues of Pamukkale Piano Learning Styles Scale

Factors	*(Initial Eigenvalues)*			*(Extraction Sums of Squared Loadings)*			*Descriptive Statistics*	
	Total	Explained Variance (%)	Cumulative variance (%)	Total	Explained Variance (%)	Cumulative Variance (%)	Mean Factors	Standard Deviation
Independent	4.702	15.672	15.672	4.702	15.672	15.672	38.55	7.263
Analytical	3.536	11.786	27.458	3.536	11.786	27.458	21.22	4.898
Dependent	2.878	9.594	37.052	2.878	9.594	37.052	11.68	3.568
Affective	2.071	6.904	43.956	2.071	6.904	43.956	10.65	2.798

The findings obtained from the factor analysis suggested the presence of four factors with eigenvalues greater than one. Therefore, we can define "Pamukkale Piano Learning Style Scale" as a four-factor Scale. As seen in Table 5, eigenvalues of these four factors and their explained variances were shown. The factors were: "independent learning style" (eight items), "analytical learning style" (seven items), "dependent learning style" (eight items), "affective learning style" (seven items). The eigenvalues of these factors, respectively, are 4.702, 3.536, 2.878 and 2.071 and the results of their explanatory factor analysis demonstrated that these factors, respectively, explained 15.672%, 11.786%, 9.594% and 6.904% of the Pamukkale Learning Style Scale.

It was determined from the explanatory factor analysis (EFA) that these extracted four factors explained 43.956% of the total variance. Şencan (2005) and Can (2014) argued that this variance rate is acceptable. Pearson correlation coefficients were calculated to investigate the relation of the four factors to each other and to the total scale score and the results are shown in Table 6. Based on the findings presented in Table 2, we see that the relation of the four factors to each other and to the total scale score was found significant. Depending on the correlation coefficients of the scale, its reliability is characterized as follows: if it ranges between 0.70 - 1.00, the reliability of the scale is highly reliable; if it ranges between 0.69 - 0.30, the reliability of the scale is moderately reliable; if it ranges between 0.29-0.00, the reliability is low (Büyüköztürk, 2006).

Table 6. Correlation of the four factors with each other and total scale

Factors	Factor 1	Factor 2	Factor 3	Factor 4	Total
Independent L.S. (F1)	*				
Analytical L.S. (F2)	.711	*			
Dependent L.S. (F3)	.687	.654	*		
Affective L.S. (F4)	.598	.705	.688	*	
Total	.857	.811	.768	.741	*

* All correlations have p< 0.01

According to the correlation analysis of four factors with each other and total scale, the correlation coefficients between total score and each factors were determined as follows: "independent learning style" (factor 1) sub-dimension is r= .857; "analytical learning style" (factor 2) subdimension is r= .811; "dependent learning style" (factor 3) sub-dimension is r=.768 and affective learning style (factor 4) sub-dimension is r= .741. Consequently, the fact that the relation between the four factors in the scale and total scale is highly significant

supports the construct validity of the Pamukkale Learning Styles Scale. The results of the KMP and Bartlett's tests were supported as well.

3.2. Language Validity of Pamukkale Piano Learning Style Scale

Pamukkale Piano Learning Style Scale is 5-likert scale of 30 items composed of four sub-dimensions. In this context, independent and affective learning styles consist of eight items and dependent and analytical learning styles consist of seven items. The scale was adapted to English language by three-people team. Afterwards, four out of eight-people group majored in English Literature and Language was asked to translate English items to Turkish and the rest of the group were asked to translate Turkish items to English. As a result of the findings obtained, the scale was finalized in English. Then, English version of the scale was administrated to 60 students majoring in English Teaching. After 10 days passed, the Turkish version of the scale was carried out and the relationship between two versions was compared. In light of the data obtained, significance level was determined using Pearson's Product Moment Correlation Coefficient test. In this context, the significance level was calculated as .714.

Table 7. Explanatory Factor Analysis

Fit Indices	Fit Range	Research Model Four-Factors Model
Total Fit Index		
χ^2/sd	$0 \leq \chi^2/sd \leq 3$	522.17 / 217= 2.40
Comparative Fit Index		
NFI	.90 ≥ - ≥ .94	.92
NNFI	.90 ≥ - ≥ .94	.91
IFI	.90 ≥ - ≥ .94	.91
CFI	≥ ,95	.95
RMSEA	0.05 ≤ - ≤ 0.08	0.071
Absolute Fit Indices		
GFI	≥ .90	.90
AGFI	≥ .85	.85
Residual Based Indexes of Compliance		
SRMR	.06 ≤ - ≤ .08	.069
RMR		.074

As seen in Table 7 to test the reliability of the four sub-dimensions identified through explanatory factor analysis, a confirmatory analysis was performed. Results from confirmatory factor analysis indicated that chi-square was (χ^2=522.17), degree of freedom (df=217, p=0.00) was χ^2/df=2.40, SRMR= .069, RMR=.074, AGFI= .85, GFI=.90, RMSEA= 0,071, CFI=.95, NNFI=.91, NFI=.92, IFI=.91. CFA revealed that χ2 /df ratio is lower than 3. Other goodness for fit indices computed by CFA were: IFI= .90 ≥ - ≥ .94; NFI = .90 ≥ - ≥ .94; NNFI =.90 ≥ - ≥ .94; CFI= ≥ .95; RMSEA= 0.05 ≤ - ≤ 0.08 and GFI= ≥ .90 AGFI =≥ .85 and lastly SRMR and RMR = .06 ≤ - ≤ .08. Consequently, the values mentioned above indicate acceptable fit.

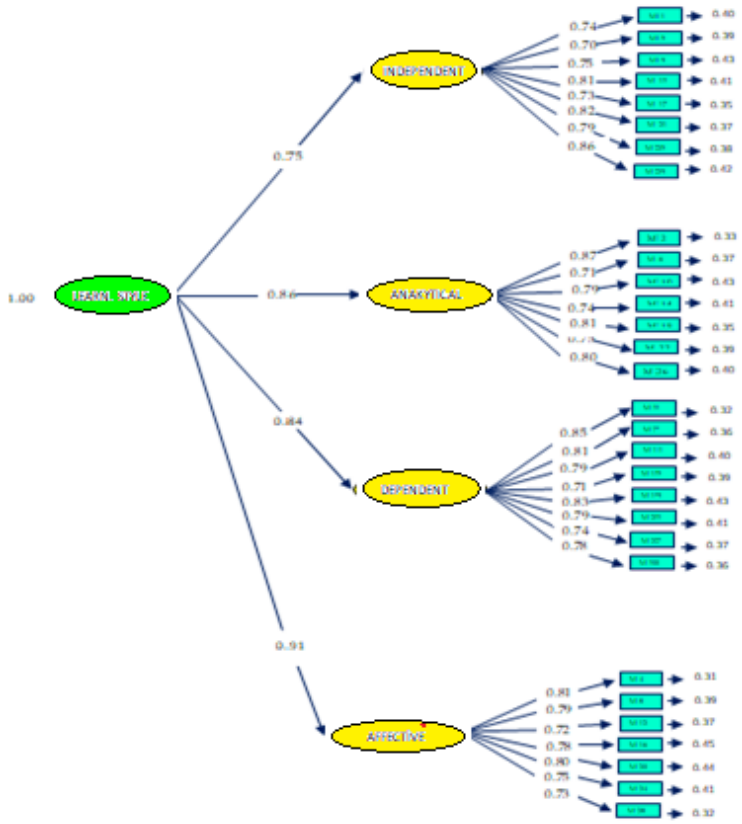

Figure 1. PPÖSÖ Four-Factor Path Diagram

From this data, it can be said that four dimensional constructions about Pamukkale piano learning style scale is appropriate. Substance factor coefficients calculated by confirmatory factor analysis are presented in Figure 1. According to this, item factor direct correlation coefficients ranged from .70 to .87. The error variances of the items ranged from .31 to .45. The observed item was found to be significant in scale relations.

4. RESULTS

As a result of the findings obtained, a learning style model was developed to find out learning style of students playing piano. According to the model, it was understood that students used four different learning styles while learning the piano. These four learning styles were named as “independent”, “analytical”, “dependent” and “affective”.

It was observed that students who prefer independent learning style are individual learners. They don’t need any external factor, a teacher or a friend. Such students can categorize pieces of music they practice, analyse and interpret them from their own point of views. They prefer to learn on their own and exhibit high self-confidence. However, since an individual learner will not benefit from a teacher experience or knowledge, independent learning style can have some drawbacks in terms of students’ vocational experience and performance.

Students who prefer analytical learning style adopt a conceptual view. They don’t work pieces of music as a whole, divide them into sections. Students try different methods and adopt solution-oriented approach in an effort to reach a solution. They prefer individual learning as well. Such students like to work in safe learning environments and they like to divide their works into smaller parts by analysing challenges they encounter. They are good at reading musical scores. They can decipher musical notation quickly. Such students learn in a

planned way and thereby learn pieces more systematically and faster. This can be seen as an advantage in students' learning process. Yet, when students work musical pieces as a whole, they can barely finish playing in time and they are delayed due to passage works, which is seen as a disadvantage in terms of analytical learning style.

Students in a dependent learning group wait for an external warning. Guidance of someone else comforts students and makes students work better when they organize their studies. As such students always are looking for other resources; they cannot read the musical notation very well. When they start to decipher a new notation, they first need to hear it from someone else. They always consult their works to be checked by someone else. In the stage of working on a musical piece, they try to reach audiovisual resources and they play them by imitating. A student using a dependent learning style has a more artistic and musical character as they access to various resources. On the other hand, they have lower self-confidence as they depend on an external factor and they cannot read the notation very well. They complete a musical piece of work in a longer period.

A student adopting affective learning style looks for a familiar tune in a musical piece. Such students can better work if they like pieces of music they play. If they don't like musical piece, they cannot perform effectively. They mostly prefer to play their pieces over and over in a wholly way. They always expect to take positive feedbacks during piano courses and if they take a negative feedback, they alienate themselves from the course. Such students who play their preferred melodies and pieces can easily learn as they have high levels of motivation. They can be successful when they find suitable conditions for themselves. On the other hand, as they always demand to play their favourite pieces, we cannot expect an efficient and qualified training. Students adopting affective learning style cannot accept their teachers' criticism.

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APENDIX 1. Pamukkale Piano Learning Styles Scale

	ITEMS	Strongly Disagree	Disagree	Moderately Agree	Agree	Strongly Agree
1	When I learn a new piece of music, I try to find out the period of the piece and its background and then study accordingly.					
2	Playing a piece in 2/2 measure allows faster progress for me.					
3	It is easier for me to play a piece after I hear it from a friend of mine for the first time.					
4	I love to practice my favourite melodies on the piano.					
5	When I learn a new piece of music, I always examine composers' characteristics.					
6	I practice passage by breaking up a musical paragraph into smaller group of notes.					
7	I try to play musical pieces by ear rather than reading notes.					
8	I can be a quick learner if I have a chance to practice my favourite piece of work.					
9	I prefer to use metronome for piano practice.					
10	I practice piano by splitting musical pieces into staves.					
11	I get motivated to play a piece after I hear it from a friend of mine.					
12	If lecturers make us to love piano lessons, we study harder and learn better.					
13	When practicing piano, I pay attention to work a piece phrase by phrase.					
14	I go through a musical pieces phrase by phrase and then combine them.					
15	As I don't read sheet music very well, I prefer to memorize a piano piece.					
16	I get motivated if I like the melody of a piece.					
17	I certainly pay attention to nuances of a musical work.					
18	When I learn a new piece, I divide it into measures.					
19	I feel confident enough to practice piano only after I hear a piece from someone else.					
20	I always learn faster if I like piano lessons.					
21	I do finger exercising before playing piano.					
22	I always try to divide a piece into 4/4 measure.					
23	To check myself before class, I perform in front of a friend of mine and ask my friend's opinion about my performance.					
24	I firstly analyse a piece and then consider its level of difficulty.					
25	When a new piece of music is assigned to me, I always analyse its harmonic structure.					
26	When I learn a new piece of music, I work on my right and left hands separately.					
27	I try to play pieces by imitating other's works.					
28	When practicing, I mostly repeat a piece over and over again.					
29	It is important for me to decipher notation by using finger numbers.					
30	I always try to memorize notation.					

Turkish version of the scale

APENDIX 2. Pamukkale Piano Öğrenme Stili Ölçeği

	MADDELER	Hiç Katılmıyorum	Katılmıyorum	Az Katılıyorum	Katılıyorum	Tamamen Katılıyorum
1	Yeni bir parça çalışırken o parçanın hangi döneme ait olduğuna bakıp o dönemin özelliklerini öğrenerek çalışırım.					
2	Parçalarımı ikişer ölçü biçiminde çalışmak beni daha hızlı ilerletir.					
3	Parçalarımı başka bir arkadaşımdan dinlemek daha kolay çalışmamı sağlar.					
4	Hoşuma giden melodileri çalışmayı isterim.					
5	Çalışacağım eserin bestecisinin özellikleri hakkında inceleme yapıp araştırırım.					
6	Çalıştığım parçayı küçük birimlere bölerek pasaj çalışması yaparım.					
7	Nota okumaya çalışmaktansa parçalarımı kulaktan dinleyerek çalmaya çalışırım.					
8	Sevdiğim bir eser olursa daha iyi çalışıp çabuk öğrenirim.					
9	Çalışırken metronom kullanmayı tercih ederim.					
10	Eserlerimi dizeklere bölerek çalışırım.					
11	Çalışacağım parçayı bir başka arkadaşımdan dinlemek beni güdülendirir.					
12	Hoca dersi sevdirirse öğrenci daha iyi çalışır ve öğrenir.					
13	Çalarken eserin cümlelerini bularak cümle çalışması yapmaya dikkat ederim.					
14	Her zaman parçalarımı cümle cümle çalışıp sonra birleştiririm.					
15	Notaları iyi okuyamadığım için ezber yapmayı tercih ederim.					
16	Çalışma isteğim eserin ezgisini sevmeme bağlıdır.					
17	Bir eserin nüanslarına mutlaka dikkat ederim.					
18	Yeni bir parça öğrenirken ölçü ölçü çalışırım.					
19	Kendime güvenerek çalışmam için parçamı bir başkasından dinlemem gerekir.					
20	Eğer dersi seversem her zaman daha hızlı öğrenirim.					
21	Çalışmaya başlamadan önce parmak egzersizi yaparım.					
22	Yeni parçalarımı her zaman dört ölçüye bölerek çalışmayı tercih ederim.					
23	Derse gitmeden önce kontrol amacı ile bir başka arkadaşıma parçamı çalarak fikrini alırım.					
24	Çalacağım parçayı inceleyip zorluk derecesini düşünürüm.					
25	Bir parça aldığımda hemen o parçanın armonik yapısını incelerim.					
26	Yeni bir parçayı öğrenmeye çalışırken sağ eli ayrı sol eli ayrı çalışmayı tercih ederim.					
27	Eserlerimi başkalarının çaldıklarını taklit ederek çıkarmaya çalışırım.					
28	Çalışmalarım bir eseri başından sonuna çok defa tekrar etmekle geçer.					
29	Deşifre yaparken parmak numarasına bakarak uygulamak benim için önemlidir.					
30	Her zaman notaları ezberlemeye çalışırım.					