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Scale for determining learning approaches to piano lesson: development, validity and reliability

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Abstract

The purpose of this study is to develop a valid and reliable instrument for defining music education students' learning approaches to piano lessons based on their own responses. The sample of the study is composed of 348 students who are enrolled to the 1st, 2nd, 3rd and 4th year classes of music education at 6 different institutions during the 2011-2012 academic year in Turkey. The measurement tool developed in this study is based on the scale for learning approaches by Biggs, Kember and Leung (2001). This scale consists of two main dimensions: deep learning approach and surface learning approach and both include the sub-dimensions of strategy and motive. The statements in the scale were determined through student essays and the relevant literature. The hypothesis of each item measuring the related psychological structure is tested by conducting an exploratory factor analysis. The sub-dimensions of the 25-item scale are distributed as 5 deep motive, 9 deep strategy, 6 surface motive and 5 surface strategy items. The factor loadings of the sub-dimensions are 0.598-0.729 for deep motive, 0.533-0.761 for deep strategy, 0.611-0.774 for surface motive, and 0.612-0.779 for surface strategy. Reliability coefficients (Cronbach's alpha) for the sub-dimensions of the scale are 0.84 for deep motive, 0.91 for deep strategy, 0.90 for surface motive, and 0.84 for surface strategy. It could be concluded that the 25-item scale developed in this study is a reliable and has structural validity.

Keywords: Piano education lesson, approaches to learning, deep learning approach, surface learning approach, scale.

1. Introduction

Piano education is a continuous basic lesson provided to music teacher candidates throughout four years at the departments of music education. Piano education lessons aim at acquainting the students with music literature through the studies and works appropriate for their technical and musical levels and developing sufficiently their piano playing techniques which might be necessary throughout their career as a teacher.

The studies during the piano education lessons could be summarized as learning techniques, learning a new study/work, developing a study/work already studied, and deciphering new studies or works (Fenmen, 1947). The steps in this process could be listed as "internalization of all the details in the study/work, mental imagination of the psycho-motor movements necessary for the transfer of the image of music to the piano, execution of these movements on the piano through accurate and fast reflexes, and criticizing the resulting image of music" (Pamir, 1984).

It could be inferred that the level of accomplishing the aims of piano lessons is related to the realization of each of these steps. It is observed in the realization of these steps that some students make an effort to learn completely,

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whereas some only seek to get a passing grade from the exam. These differences observed in students indicate that students adopt different approaches to learning based on their perceptions of the learning task during the piano lessons.

The concept 'approach to learning' was coined by Marton and Saljö (1976) in a qualitative study they conducted. The researchers found out that the students processed the text they were asked to read at two distinct levels: deep and surface. The results of the study showed that the learning efforts of the students who processed the text at the deep level were related to reading comprehension, while the students who processed the text at the surface level aimed only at exhibiting a satisfactory performance during the exam (Marton and Saljö, 1976; cited in Yılmaz, and Orhan, 2011).

In terms of students' viewpoint on the topic, the approach to learning suggests that the student asks a motivation question (Why do I study this?) and a strategy question (What should I do to learn?) (Tang et al., 2000, cited in Yılmaz, 2009). Thus, it is observed that the scales developed for approaches to learning are composed of items that measure the strategies used by students and the types of motivations that students have for studying or not studying.

Approaches to learning are one of the important variables of the learning process. Approaches to learning are also an important variable of the learning process during piano lessons. The measurement of this variable requires the development of an appropriate scale. The purpose of this study is to develop a valid and reliable measurement tool for determining the approaches to learning of students of department of music education.

2. Method

This study is a scale development study conducted through the scanning model. Whereas the scale aiming at determining university students' learning approaches in Biggs, Kember and Leung (1987) consisted of 43 items and 3 dimensions, the scale developed in the current study is based on the Study Process Questionnaire (R-SPQ- 2F) (2001) which re-developed the original as a 20-item and 2-dimension scale. This scale is composed of two main dimensions: deep learning approach and surface learning approach. Each of the two dimensions has the motive and strategy sub-dimensions.

The scale developed by Biggs, Kember and Leung has been widely used in several studies aiming to measure university students' learning approaches. Thus, the scale for determining the learning approaches to piano lesson was developed within the framework of the main and sub-dimensions of the abovementioned scale.

Sample

The sample of this study consists of 348 students enrolled to the 1st, 2nd, 3rd and 4th year classes at 6 departments of music education in Turkey during the fall semester of 2011-2012 academic year. The departments of music education are at Abant Izzet Baysal University, Atatürk University, Gazi Osman Paşa University, İnönü University, Niğde University and Selçuk University.

59.8 percent (n=208) of the students in the sample were female, while 40.2 percent (n=140) were male. The distribution of the students according to the universities they are enrolled to is as follows: 16.7 percent at Abant Izzet Baysal University (n=58), 16.4 percent at Atatürk University (n=57), 11.2 percent at Gazi Osman Paşa University (n=39), 16.1 percent at İnönü University (n=56), 25.6 percent at Niğde University (n=89), and 14.1 percent at Selçuk University (n=49). The distribution of the students according to the grade level is 28.2 percent (n=98) 1st grade, 24.7 percent (n=86) 2nd grade, 24.7 percent (n=86) 3rd grade, and 22.4 percent (n=78) 4th grade.

Procedure

Preparation of the Candidate Form of the Scale

The statements in the scale used in this study regarding the students' deep and surface learning approaches to the piano lessons were developed by examining student essays, the relevant literature and the scales for measuring students' approaches to learning. First, 40 students at the Department of Music Education, Niğde University during the fall semester of 2011-2012 academic year were asked to write an essay on "learning motives and study methods in piano lessons". Through the examination of the student essays, the common expressions were written down as scale statements. Then, the relevant literature and the scales for learning approaches were examined to determine the statements in the scale.

The studies that were consulted in order to write the scale statements are as follows:

• Biggs, Kember and Leung (2001) Study Process Questionnaire (R-SPQ-2F), the original scale and the form in Turkish (reliability and validity of the Turkish version of the form: Yılmaz, 2009; Önder and Beşoluk, 2010; Yılmaz and Orhan, 2011a, 2011b),

• 22-item scale by Biggs, Kember and Leung (2004) to determine the learning approaches of students of secondary (reliability and validity of the Turkish version of the form: Çolak and Fer,2007),

• Qualitative study by Cantwell and Millard (1994) "The Relationship Between Approach to Learning and Learning Strategies in Learning Music",

• 54-item scale developed by Ekinci (2008) in order to determine the university students' levels of learning approaches, composed by 3 sub-dimensions, namely, deep, surface and strategic (Ekinci, 2008, 2009),

• 30-item scale called "Learning Approaches Scale" by Ellez and Sezgin (2002) (Ellez and Sezgin, 2002; Sezgin, Çalışkan and Erol, 2007),

• 67-item "The Approaches and Study Skills Inventory for Students" (ASSIST) scale developed by Entwistle (1997) (Senemoğlu, 2011),

• 18-item short form entitled "Learning and Studying Approaches Inventory" by Hounsell, Entwistle, Anderson et al. (2002) (reliability and validity of the Turkish version of the form: Topkaya, Yaka and Öğretmen, 2011),

• "The Relationship between Approaches to Learning and Reflection upon Practice" by Leung and Kember (2003), and

• "Learning Approaches to Science Scale" developed by Ünal-Çoban and Ergin (2006, 2008), based on Entwistle and Ramsden's (1983) Approaches to Learning Scale (Aydoğdu and Ergin, 2010).

The scale items were developed by adding the Likert-type rating options to the statements determined through the examination of the student essays, the relevant literature and the scales for learning approaches. Likert-type ratings were "always", "often", "sometimes", "rarely" and "never". The scale was composed of 40 items and two main dimensions of deep and surface learning approach. These main dimensions include the motive and strategy sub-dimensions.

In order to determine the structural validity and the reliability of the scale, it was applied to 348 students who constituted the sample. Table 1 presents the quantitatively coded values of the scale according to the positive and negative statements.

Table 1. *Quantitative values of the positive and negative statements in the scale*

Option	Positive Statement Score	Negative Statement Score
Always	5	1
Often	4	2
Sometimes	3	3
Rarely	2	4
Never	1	5

These values on learning approaches were entered as data using SPSS software. In order to determine the validity, reliability and internal consistency reliability of the scale, exploratory factor analysis and Cronbach's alpha were used, and the mean and standard deviation values of the scale were calculated.

3. Results

This section presents the results of the analyses conducted to reveal the reliability, validity and internal consistency reliability of the "scale for determining learning approaches to piano lessons".

Reliability

To determine the reliability and validity of the scale, first the item-total statistics obtained at the first stage of the study were examined. Table 2 presents the first distribution of the item-total statistics.

Table 2.*Item statistics I*

Item-Total Statistics				
Item	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's alpha value if item deleted
1	137.59	1135.511	.779	.967
2	137.31	1141.914	.698	.968
3	137.24	1124.120	.829	.967
4	139.01	1226.406	-.339	.972
5	137.71	1140.408	.695	.968
6	137.71	1129.482	.796	.967
7	138.21	1149.447	.541	.968
8	137.96	1184.745	.139	.970
9	138.11	1133.414	.694	.968
10	137.54	1140.987	.746	.967
11	137.15	1137.321	.701	.968
12	137.27	1120.565	.824	.967
13	137.22	1126.729	.843	.967
14	137.78	1133.353	.758	.967
15	137.34	1119.481	.843	.967
16	137.65	1138.746	.650	.968
17	137.94	1154.654	.523	.968
18	137.64	1142.358	.708	.968
19	137.33	1122.425	.800	.967
20	137.35	1132.925	.719	.967
21	137.59	1135.557	.659	.968
22	138.13	1144.966	.625	.968
23	137.35	1141.924	.652	.968
24	137.68	1138.038	.650	.968
25	137.57	1148.407	.613	.968
26	137.43	1145.215	.656	.968
27	137.71	1134.874	.704	.968
28	137.47	1125.823	.769	.967
29	137.21	1142.524	.668	.968
30	137.59	1130.012	.777	.967

31	137.87	1162.966	.386	.969
32	137.65	1144.309	.642	.968
33	137.66	1151.043	.620	.968
34	138.11	1153.583	.523	.968
35	137.60	1134.401	.636	.968
36	137.35	1150.419	.567	.968
37	137.13	1134.432	.784	.967
38	137.58	1137.812	.708	.968
39	137.24	1121.476	.808	.967
40	137.71	1142.545	.601	.968

As shown in Table 2, the reliability coefficient of the whole scale, the Cronbach's alpha value is approximately 0.97. The value being greater than 0.60 shows that the scale is reliable. Moreover, none of the values in the last column of the table increases the value 0.97 significantly. However, the corrected item-total correlations resulting below 0.30 affect negatively the reliability of the scale, so the analyses should be repeated after removing the items with the corrected item-total correlation value below 0.30. (Büyüköztürk, Çakmak, Akgün, Karadeniz and Demirel, 2010: 125).Thus, the items 4 and 8 were removed from the scale and the reliability analysis was repeated. Table 3 presents the redistribution of the results of the item-total statistics.

Table 3. *Item statistics II*

Item-Total Statistics				
Item	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's alpha value if item deleted
1	132.27	1147.211	.783	.972
2	131.99	1153.380	.705	.972
3	131.92	1135.872	.831	.972
5	132.39	1151.938	.701	.972
6	132.39	1140.900	.803	.972
7	132.89	1161.268	.543	.973
9	132.79	1144.950	.699	.972
10	132.22	1152.239	.756	.972
11	131.83	1149.757	.696	.973
12	131.95	1132.519	.824	.972
13	131.89	1138.337	.847	.972
14	132.46	1144.877	.763	.972
15	132.02	1131.406	.843	.972
16	132.33	1151.144	.645	.973
17	132.62	1166.104	.531	.973
18	132.32	1154.044	.712	.972
19	132.01	1134.346	.800	.972
20	132.03	1145.103	.716	.972
21	132.26	1148.011	.654	.973
22	132.81	1156.842	.627	.973
23	132.03	1154.498	.646	.973
24	132.36	1150.030	.651	.973
25	132.25	1160.538	.613	.973
26	132.11	1156.653	.664	.973
27	132.39	1147.230	.700	.972
28	132.15	1137.805	.769	.972
29	131.89	1154.186	.673	.973
30	132.27	1141.915	.778	.972
31	132.55	1175.528	.381	.974
32	132.33	1156.624	.639	.973
33	132.34	1162.795	.624	.973
34	132.79	1165.531	.525	.973
35	132.28	1146.497	.635	.973
36	132.03	1162.780	.563	.973
37	131.81	1146.177	.787	.972

38	132.26	1149.332	.714	.972
39	131.92	1133.242	.810	.972
40	132.39	1154.734	.599	.973

As shown in Table 3, corrected item-total correlations of the remaining 38 items of the scale are above 0.30. In this case, the reliability coefficient of the scale, the Cronbach's alpha value is 0.97. it could be concluded that the 38-item scale has high reliability.

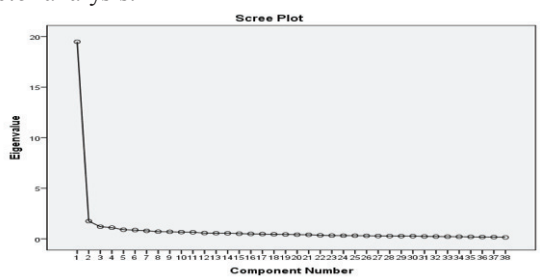
Validity

The results of the factor analysis conducted to examine the structural validity of the 38-item scale are presented below. Before proceeding, the adequacy of the data for factor analysis should be tested. The results of the KMO and Bartlett tests used for this purpose are presented in Table 4.Conclusion and Discussion

Table 4. *Tests for adequacy for factor analysis*

KMO and Bartlett Tests		
Kaiser-Meyer-Olkin Sampling Adequacy		0.976
Bartlett sphericity test	Chi-square	9783.891
	sd	703
	p	0.00

It is seen in Table 4. that the KMO adequacy value is 0.976. The value of CME being greater than 0.60 and the result of the Barlett being significant show that the data are appropriate for factor analysis (Büyüköztürk, 2008, p. 126). The KMO value is higher than 0.60 and the result of the Barlett test is significant ($p < 0.05$). It could be inferred that the scale is appropriate for factor analysis. Graph 1 shows the graph of the eigenvalues of the components obtained after the factor analysis.



Graph 1. *Component eigenvalues*

It could be stated that the scale consists of two components according to Graph 1. However, the component matrix composed of components with eigenvalues higher than 1 was obtained in four dimensions, as seen in Table 5.

Table 5. *First component matrix of the factor analysis*

Rotated component matrix				
	Component			
Item	1	2	3	4
1		.688		
2		.718		
3		.575		
5		.608		
6		.658		
7	.513	.570		
9		.579		
10		.539		
11	.636			
12	.600			
13	.525	.557	.426	
14			.590	

15	.571			
16	.529			
17			.685	
18			.593	
19	.592			
20	.587			
21	.467			
22			.606	
23	.589			
24	.612			
25	.628		.481	
26			.518	
27				.550
28	.462	.556		
29	.539			
30		.512		
31				.746
32				.679
33			.532	
34			.751	
35				.452
36	.562			
37	.580	.474		
38			.518	
39	.460	.494		.406
40				.529

As seen in Table 5, the loadings of some items show that the items could be found in more than one component. Removal of these items is suggested to ensure independence between the components. (Johnson and Wichern, 1992: 433). In addition, the items with loading factors below 0.40 affect the validity. These items are marked in the table. Accordingly, the items 7, 13, 25, 28, 37 and 39 should be removed from the scale. The rotated component matrix obtained after removing these items is presented in Table 6.

Table 6. Second component matrix of the factor analysis

Rotated component matrix			
	Component		
Item	1	2	3
1	.589		
2	.587		
3	.710		
5		.555	
6		.636	
9		.578	
10		.622	
11	.765		
12	.767		
14		.674	
15	.726		
16	.631		
17		.722	
18		.666	
19	.659		
20	.687		
21	.500	.428	
22		.623	
23	.609		
24	.510		

26		.563	
27	.502		.540
29	.585		
30	.541		
31			.773
32			.672
33		.582	
34		.758	
35	.500		
36	.536		
38		.555	
40			.570

As shown in Table 6, the loadings of the items 21 and 27 show that these items could be in more than one component. To ensure independence between the components, these items must be removed. In addition, the items 31, 32 and 40 gather in the same component. By removing these items, the number of components could be reduced to two, as presented previously in Graph 1. The rotated component matrix obtained after removing these items is presented in Table 7.

Table 7. Third component matrix of the factor analysis

Rotated component matrix		
	Component	
Item	1	2
1		.614
2		.533
3	.728	
5		.593
6		.673
9		.614
10		.647
11	.772	
12	.781	
14		.696
15	.750	
16	.665	
17		.729
18		.692
19	.724	
20	.756	
22		.630
23	.682	
24	.611	
26		.585
29	.560	
30	.562	
33		.601
34		.760
35	.609	
36	.628	
38		.579

The items 29 and 30 belonging to deep learning approach seem to be in the first component in Table 7. However, the first component is composed of items that represent surface learning approach. Thus, these items should be remove from the components. The results of the factor analysis after removing these items are presented below. In Table 8, the numbers in parentheses show the new item numbers.

Table 8.*Fourth component matrix of the factor analysis*

Rotated component matrix		
	Component	
Item	1	2
1 (1)		.615
2 (2)		.533
3 (3)	.728	
5 (4)		.598
6 (5)		.673
9 (6)		.616
10 (7)		.649
11 (8)	.774	
12 (9)	.779	
14 (10)		.697
15 (11)	.752	
16 (12)	.664	
17 (13)		.729
18 (14)		.695
19 (15)	.726	
20 (16)	.757	
22 (17)		.630
23 (18)	.686	
24 (19)	.612	
26 (20)		.586
33 (21)		.604
34 (22)		.761
35 (23)	.611	
36 (24)	.625	
38 (25)		.580

As seen in above table, the factor loadings of item 25 range between 0.53 and 0.78. The scale composed of 25 items and 2 dimensions explains 59.19 percent of the variance. Table 9 presents the distribution of the items of the components and their factor loadings.

Table 9. *The distribution of the items of the components and their factor loadings*

Dimension	Sub-dimension	Item number	Items	Factor loading
Deep Learning Approach	Deep Motive	5	1, 4, 6, 13, 21	0.598-0.729
	Deep Strategy	9	2, 5, 7, 10, 14, 17, 20, 22, 25	0.533-0.761
Surface Learning Approach	Surface Motive	6	3, 8, 11, 15, 18, 23	0.611-0.774
	Surface Strategy	5	9, 12, 16, 19, 24	0.612-0.779

Table 10 shows the distribution of the reliability coefficients according to the sub-dimensions of the scale.

Table 10. *Reliability coefficients for the sub-dimensions*

Dimension	Sub-dimension	Item number	Reliability coefficients
Deep Learning Approach	Deep Motive	5	0.84
	Deep Strategy	9	0.91
Surface Learning Approach	Surface Motive	6	0.90
	Surface Strategy	5	0.84

Internal consistency reliability

Table 11. *Arithmetic mean and standard deviation values of the learning approaches to piano lessons scale*

Deep Learning Approach				Surface Learning Approach			
Item No	n	Mean	SD	Item No	n	Mean	SD
1	348	3.56	1.19	3	348	3.91	1.33
2	348	3.84	1.19	8	348	4.00	1.28
4	348	3.44	1.23	9	348	3.88	1.40
5	348	3.44	1.28	11	348	3.81	1.39
6	348	3.03	1.38	12	348	3.49	1.35
7	348	3.61	1.14	15	348	3.81	1.40
10	348	3.36	1.27	16	348	3.80	1.34
13	348	3.20	1.22	18	348	3.79	1.27
14	348	3.51	1.17	19	348	3.46	1.36
17	348	3.02	1.26	23	348	3.54	1.47
20	348	3.71	1.19	24	348	3.79	1.24
21	348	3.49	1.13				
22	348	3.03	1.25				
25	348	3.57	1.26				
Toplam		47.81	17.16			41.28	14.83

Table 11 shows that the mean of the items related to deep learning approach is 3.415 (47.81/14), while the mean of the items related to surface learning approach is 3.753 (41.28/11). In line with the five options used in the scale, the evaluation intervals were calculated in order to interpret the arithmetic means. Accordingly, the interval 1.00-1.79 signifies “never”, 1.80-2.59 “rarely”, 2.60-3.39 “sometimes”, 3.40-4.19 “often”, and 4.20-5.00 signifies “always”. It was observed that the responses in both dimensions accumulate in the statement “often”.

4. Conclusions and Recommendations

This study developed a scale aiming to determine the learning approaches to piano lessons. The scale was composed of two main dimensions: deep learning approach and surface learning approach. These main dimensions include the motive and strategy sub-dimensions. The 25-item scale consisted of deep motive sub-dimension with 5 items, deep strategy with 9 items, surface motive with 6 items and surface strategy with 5 items. The factor loadings of the sub-dimensions were as follows: 0.598-0.729 for deep motive, 0.533-0.761 for deep strategy, 0.611-0.774 for surface motive and 0.612-0.779 for surface strategy. The reliability coefficients for the sub-dimensions were found as 0.84 for deep motive, 0.91 for deep strategy, 0.90 for surface motive, and 0.84 for surface strategy. To conclude, it could be stated that the 25-item scale developed for this study is reliable and has structural validity. It is suggested that the tests related to the validity and reliability of the scale be repeated with larger samples and using different methods of analysis.

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APPENDIX

SCALE FOR DETERMINING LEARNING APPROACHES TO PIANO LESSON

Item No	*Items*	Always	Often	Sometimes	Rarely	Never
1	Studying for a piano lesson gives me an intense sense of personal satisfaction.					
2	I am satisfied only after I reach the performance I have aimed at through practicing a study/work given in the piano lesson.					
3	I aim at passing the piano class by studying as little as possible.					
4	I find studying almost all studies/works given in the piano lesson an interesting experience.					
5	I find the new studies/ works in the piano lesson interesting; I spend extra time to perform them in the best manner.					
6	I find practicing a new piano study/ work as exciting as visiting a city for the first time.					
7	I test my piano performance of a new study/work until I fulfil the technical and musical elements in the study/work completely.					
8	I think it is loss of time trying to accomplish more when a slapdash performance is enough to pass the piano class.					
9	I find it unnecessary to do extra work for the piano lesson; I continue my studies so as to get a passing grade.					
10	I do not practice a study/work given in the piano lesson for only having played or studied, but rather I try to grasp the message that the composer of the study/work tries to convey.					
11	I keep my efforts towards the piano lesson at a minimum level, as I am not interested in the piano lesson.					
12	I keep my piano practices limited to the mandatory learning tasks given in the lessons					
13	I come to the piano lesson with questions in my mind for which I want answers.					
14	I test the effectiveness of the suggested training ways in the piano lesson and of the technical/musical exercises on my piano performance.					
15	I find it unnecessary to practice more than the tasks given in the piano lessons.					
16	I do not study for the technical/musical exercises other than studies/works given in the piano lesson, as I do not think they will be asked in the exam.					
17	Although not mandatory in the piano lesson, I am interested in and do research about several subjects, such as piano pedagogy, different interpretations of the study/work I practice, different examples of piano music, etc.					
18	I believe it is confusing to have detailed technical and musical knowledge about a piano study/work.					
19	I do not do research on topics like the characteristics of the period and the composer of the study/work given in the piano lesson, as I do not think they will be asked in the exam.					
20	I seek for new ways if the methods I apply during practicing a study/work given in the piano lesson prove to be unsuccessful.					
21	What I learn in the piano lesson helps me form interrelated thoughts in my mind.					
22	I try to relate the study/work given in the piano lesson to real life situations as I practice them.					
23	I find myself asking “Why do I have to play/practice the piano?”.					
24	I prefer practicing studies/works well below my technical and musical level during the piano lesson.					
25	If I find out that I do not sufficiently learn what I should have learnt while practicing a piano study/work, I ask the reason why.					