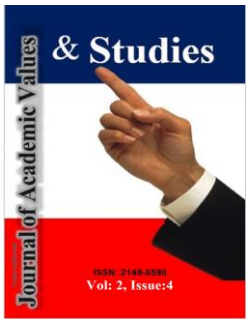

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Identifying the Perceptual Learning Styles Of Foreign Language Learners: A Comparative Study In TR63 (Osmaniye, Hatay And Kahramanmaras)*

Asst. Prof. Dr. Mehmet KURT[1]
[1] Kahramanmaras Sutcu ımam University, Faculty of Science and Letters
Asst. Prof. Dr. Hayriye BİLGİNER[2]
[2] Kahramanmaras Sutcu ımam University, Faculty of Science and Letters

Abstract

In the globalizing world economy, for the realization of international trade is increasing the need for foreign language learning. TR63 (Kahramanmaraş, Osmaniye and Hatay) region is increasing its export every day. Besides these advances, interest is awakening in foreign language education among the region. In preparing syllabus for this kind of an education detection of perceptual learning styles of the learner provides solutions for special areas. To do so, the present study aims to identify the perceptual learning styles of the foreign language learners in a comparative way. The results of the study will lead preparation of syllabus for language learning not only based on the language needs but also the perceptual learning styles of the learners. Thus, the present study is aimed to shed light to the efforts on forming educational programs for special solutions for specific areas.
In order to do so, a survey adapted from literature is applied to 580 students in foreign language students in state universities of Kahramanmaraş, Osmaniye and Hatay. Statistical analyses are applied to the data via the use of SPSS 18 and AMOS 16. The results of the study revealed that, students acquire language in different ways. So, more specified syllabi should be used in order to obtain better results in language teaching.

Keywords: Language Education, Perceptual Learning Styles, TR63 Region
JEL Classification: R11, R13, I21

1. INTRODUCTION

In language teaching it is essential to focus on the specific needs of the students (Briggs, 2000: 16). Because of this fact instructors should deploy specific techniques for different learning expectations (Hawk & Lyons, 2008: 200). This is only possible when specific syllabi is prepared and used for different purposes Poerksen, 2005: 475).

With this point of view, this study focuses on determining the specific learning styles of the foreign language learners within the Turkish context. In order to do so, a detailed literature review is conducted. The results of the literature review suggests that the prior studies focuses on only one context. So, the present study aimed to focus on the regional needs of the students. While doing so, the methodology, findings and the theory of the former studies are worked over. In the second stage of the study, a questionnaire adapted from the literature (Reid, 1984: 1) is applied to 580 students from three different cities located in TR63 region

* This studiy is based on a scientific Project which was conducted buy Ass.Prof.Dr.Mehmet Kurt and Ass.Prof.Dr.Hayriye Bilginer at Kahramanmaras Sutcu Imam Universtiy

(Kahramanmaraş (247), Hatay (219), Osmaniye (114)). The sample is formed randomly and the size is constituted according to the general number of students in state universities.

The third stage of the present study included a detailed analysis of the data via the use of SPSS 18 and AMOS 16. Initially the demographic features of the sample is handled. The results affirmed that the right sample is assessed by means of the age, city and sex. After that, the analysis covered some statistical analysis focusing on the reliability issues. Henceforward, a detailed factor analysis (CFA and EFA) is applied. The results verified that, there are certain differences among the perceptions of the students. Thence, it is crucial to implement specified syllabi for different needs. The study also focused on the relationships among different learning types. Thus, practical notices are derived for the use of the instructors in language teaching.

2. LITERATUR REVİEW

Although, individual differences is the hub of language teaching literature, the number of former studies are limited (Chan & Mak, 2010: 41). Howbeit, there are practical attempts focusing on the topic. Hawk & Lyons (2008: 197) investigated the effects of different learning styles in various learning environment by using the learner perceptions. The results of the study indicate that individualized learning environment is more efficacious on learners. Moreover, Papadopoulos, Demetriadis, Ioannis & Tsoukalas (2010: 198) approved that students with different learning styles can achieve more by directing them to more suitable learning environment to their own learning styles. Aslo, Chan & Mak (2010: 41) commentated on the use of learning styles questionnaires in Macao context. The study focused on a questionnaire and the results revealed that learners with distinctive learning styles behave differently. Besides these, gender, age, academic achievement and departments are found to be decisive in learner behavior.

Briggs (2000: 16) also conducted a deterministic study on learning styles of the students of vocational high school students. This study came up with some evidence confirming that students with different learning styles cannot be handled as the same. Moreover, the findings assert that instructors can benefit from different learning styles in teaching atmosphere.

Furthermore, Böstrom & Lassen (2006: 178) focused on learning styles and strategies. The throughput of the study affirmed that if students are approached according to their specific learning types, they can achieve more. Moreover, if the students are alert at their personal learning styles, they can generate individualized strategies for better learning. Another study focusing on the perceptions of the students is carried by Ghinea (2010:39) implies that perceptions shape the personality of the individual. Chan (1999: 294) conducted a study on identification of students' learning styles. The results of the study depict that local culture is affective in learning styles. With this point of view, the present study is expected to make a great contribution to the literature.

Boyatzis & Kolb (1995: 3) made the development of learning abilities via learning styles the center of their research. With a glance to the findings of this study, it is asserted that, learners should achieve more, by using various learning styles. Robotham (2003: 473) also focuses on improving learning ability via learning styles. The author claims that, students should be canalized according to their personal learning styles in order to obtain better learning results. Another study of the same author also alleges that personalized learning programs can provide a better learning environment.

The literature review also revealed some evidence on the perceptions and learning levels. Chow, Treena, Kelly & Woodford (2012: 544) conducted a comparative research and with the use of the same syllabus, the authors obtained different learning levels among students with different learning styles. On the other hand, Entwistle (2001: 593) adopted a deterministic

approach and tried to identify learning styles of the students. The findings of the research asserts that universities should apply personalized education programs. Another study in the university context (Becker & Tennent, 2007: 105) investigated the relationship between deployment of personalized learning programs and academic achievements. It is found that students aware of their learning styles can achieve more. The study also asseverates that online services should also be presented in a personalized way. Zajac (2009: 256) also focused on online services and similar results verifying the fact that personalized services can provide better achievement ambience. Besides these, Poerksen (2005: 471) zoomed in how to learn learning. The results of the study affirms that if individuals are aware of their learning styles, they can react and response much more easily.

Relationships among learning styles are also subject to the literature. Viola, Graf & Leo (2007: 7) examined the affairs amidst several learning styles. The results of this study are substantial as they can be used in development of new personalized syllabi for a sample with multicultural attributes. Another study, with this scope is made by Cools, Evans & Redmond (2009: 5). The authors, concluded that culture is decisive in development of learning styles. This finding verifies the findings of Chan (1999: 294)'s research in Chinese context. Similar research is accomplished by Eaves (2009: 61) and it asserts that technology and multiculturalism is determinative in learning styles. A detailed literature review on students' learning styles is carried out by Tickle (2001: 955) and valuable information is provided.

The recent studies on the topic are scanty, but the scope of the topic seems to be varied. For instance Lawter, Rua & Guo (2014: 580) examined the effects of learning styles on ethical issues.

To sum all, the literature is rich in deterministic and comparative studies. It can be derived that there is consensus on use of personalized syllabi can provide better learning environments. Moreover, the topic is up to date as it is being examined with ethical issues, online services and distance education. Lastly, the literature review also exposed the need for the present study.

3. LEARNING STYLES

Individual perceive the world in different ways and this fact shed light the development of intellectual property in many ways (Briggs, 2000: 17). With this perspective, human beings are able to transfer the knowledge created in educational institutions (Chan & Mak, 2010: 41). There are many researches based on identification of learning styles (Treena, Finney & Woodford, 2012: 545). All of these researches enable us to organize personalized educational syllabi (Poerksen, 2005: 475). In order to develop these programs, we need to assess how the learners perceive learning (Robotham, 1995: 5). Briggs (2000:17) classifies these styles in visual, auditory and kinesthetic dimensions. Yet, it is not efficient to determine all the learning styles. So, the groups that Demetriadis, Ioannis & Tsoukalas (2010: 198) used (visual, tactile, auditory, group, kinesthetic and individual) are more appropriate to cover all of the learning styles.

Table 3.1. Learning Styles And Distinctive Features

Learning Styles	Features
Visual	This group of learners are salient with recalling visual materials (Eaves, 2009: 629. They can remember any visual detail. These people can perform superior performance while being faced with any visible material.
Tactile	They are good at making handy jobs as they are good at estimating the names of the materials even if they are blindfold.
Auditory	This group of learners are good at listening activities and they can recall any sound better than the other groups.
Group	These are the ones which can perform better performance in a group activity.
Kinesthetic	They can learn psycho-motor activities with superior performance and they need to do

	what is being told in order to learn.
Individual	Contrary to the group learners this group can perform better performance while they are on their own.

4. EMPIRICAL STUDY

Empirical research shows that with personalized educational programs, students can effectuate themselves better in learning activities (Boström & Lassen, 2006: 183). Also, prior research reports that there is an association between approaches and outcomes (Entwistle, 20001: 598). With this point of view, the present study covers an empirical field study aiming to identify the learning styles of university students in Turkish context.

In order to so, a sample is randomly defined and a measure adopted from the literature is applied in three different cities. Data obtained from the questionnaire is analyzed via the use of some statistical techniques. The results of the study include some implications for practitioners of language teaching.

4.1. Sampling

Sampling is done randomly according to the methodology of former researches (Hawk & Lyons, 2008: 198; Boyatzis & Kolb, 1995: 8; Treena, Kelly & Woodford, 2012: 552). Total number of university students in state universities of three cities is approximately 110.000. By using the sampling methodology of the former literature, a sample size of 539 is adequate with %98 reliability level. The authors distributed 600 questionnaires and were able to obtain 580 usable forms. The return ratio of the questionnaire is 96,6. To sum all up, the authors were able to collect decent sample size.

4.2. Measure Development and Adaptation

The measures in the former literature made use of the measure developed by Reid (1984: 1). This questionnaire is translated into Turkish by skilled academics and they are asked to peer-correct their drafts in order to get the same notion of the original questionnaire. Besides, age, sex and the city are added to questionnaire forms. Also, academics and students are asked to fill in a pre-test and the results of this work were satisfactory (Papadopoulos, Demetriadis, Ioannis & Tsoukalas, 2010: 198).

4.3. Descriptive Statistics

The former literature is rich in studies including the descriptive statistics of the researches (Boyatzis & Kolb, 1995: 4; Treena, Kelly & Woodford, 2012: 549; Lawter, Rua & Guo, 2014: 586). So, the present study covered some statistics about the data obtained from the questionnaire.

Initially tests are applied in order to detect whether the right sample is assessed or not. Most of the sample includes males (444 (%76,6)), whereas the number of females are limited (136(%23,4)). This finding fits with the number of students in three cities. Although many attempts are being performed in order to throw women in education, their number is still scarce in education.

Age differs from min. 17 to max. 27. The majority of the students are 18-21 years old. This also shows that a good sample is achieved. TR63 region covers three cities and participants from the cities are parallel to the number of university students ((*Kahramanmaraş (247), Hatay(219), Osmaniye(114)*). Table 4.1. depicts detailed information.

Table 4. 1. Descriptive Statistics

	N	Min.	Max.	Mean	Std. Dev.
Gender	580	1,00	2,00	1,2345	,42404
Age	580	17,00	27,00	21,0000	2,46355
City	580	1,00	3,00	1,7707	,75552
Visual1	580	1,00	5,00	3,1707	1,64569
Visual2	580	1,00	5,00	3,3000	1,64658
Visual3	580	1,00	5,00	4,0466	1,19855
Visual4	580	1,00	5,00	3,4517	1,37812
Visual5	580	1,00	5,00	3,5466	1,42137
Tactile1	580	1,00	5,00	4,3310	,92969
Tactile2	580	1,00	5,00	4,1741	1,02761
Tactile3	580	1,00	5,00	4,0431	1,13198
Tactile4	580	1,00	5,00	3,6741	1,40282
Tactile5	580	1,00	5,00	3,8293	1,23709
Auditory1	580	1,00	5,00	4,0483	1,06657
Auditory2	580	1,00	5,00	3,7517	1,24416
Auditory3	580	1,00	5,00	3,9724	1,07697
Auditory4	580	1,00	5,00	3,9466	1,10997
Auditory5	580	1,00	5,00	3,8862	1,18314
Group1	580	1,00	5,00	3,7621	1,13293
Group2	580	1,00	5,00	3,6707	1,20312
Group3	580	1,00	5,00	3,5310	1,17284
Group4	580	1,00	5,00	3,7603	1,11023
Group5	580	1,00	5,00	3,6983	1,13372
Kinesthetic1	580	1,00	5,00	3,7379	1,19163
Kinesthetic2	580	1,00	5,00	3,7638	1,20494
Kinesthetic3	580	1,00	5,00	3,7397	1,20569
Kinesthetic4	580	1,00	5,00	3,8448	1,22018
Kinesthetic5	580	1,00	5,00	3,5879	1,33410
Individual1	580	2,00	5,00	3,8000	,91504
Individual2	580	1,00	5,00	3,6707	1,09489
Individual3	580	1,00	5,00	3,6793	1,13231
Individual4	580	1,00	5,00	3,9328	,86615
Individual5	580	1,00	5,00	3,9707	,88988
Valid N (listwise)	580				

The means and standard deviations are assessed in order to see whether there are missing parts in the data. The results indicate that usable results are obtained. The gender differs from male to female and the mean value is consistent with the sample dynamics. The items aimed to measure visual learning seems to have similar means except from Visual3. Moreover, items aimed to measure tactile learning have means alike. Items used for identification of auditory learners have similar means. Lastly, items for measuring group, kinesthetic and individual learners have also means alike. This shows that the sample performed well in filling the forms. The sample shows a great deal in tactile learning whereas the mean is the lowest in group learning. Turkish people are not very ready to cooperate and they are volunteer to touch anything they see. So, the results imply that a good sample is obtained.

4.4. Reliability and Validity and Interscale Correlation Issues

In this part of the study, it is aimed to assess the reliability and validity of the used survey. In order to do so, former literature is reviewed and the same methodology is used (Felder & Spurlin, 2005: 103; Eren, 2016: 47). The statements aimed to measure the same type of learning are checked by means of Cronbach alfas for inter-item reliabilities. The results are depicted in Table 4. 2.

Table 4.2. Reliability Statistics

Learning Styles	Cronbach's Alpha Score	N of Items
visual	0,909	5
tactile	0,883	5
auditory	0,885	5
group	0,869	5
kinesthetic	0,910	5
individual	0,951	5

All of the learning types reported high Cronbach alpha scores ranging from 0,883 to 0,951, which means that the used scale is reliable. As Felder & Spurlin(2005: 103) suggest, interscale correlations are assessed.

Table 4.3. Interscale Correlations

	visualmean	**tactilemean**	**auditorymean**	**groupmean**	**kinestheticmean**
Tactilemean	,326**				
Auditorymean	,533**	,533**			
Groupmean	,176**	,429**	,351**		
Kinestheticmean	,290**	,470**	,605**	,516**	
Individualmean	,433**	,473**	,597**	,253**	,544**

**. Correlation is significant at the 0.01 level.

The means of the statements for the same learning style is calculated and they are put into bivariate correlations. The results imply that, the correlations differ for different learning styles. The highest correlation is found to be among auditory and kinesthetic learners. Whereas, the lowest correlation is among visual and group learners. As expected there is a very low correlation between individual and group learners. These results are statistically significant ($p<0.01$) and show that syllabi should be prepared according to the different needs of the learners. Moreover, these results also depict some evidence for the sequence and order of the learning style related activities.

4.5. Assessment of Demographic Features

The age, sex and the cities are asked to fill in the questionnaire. Parallel to prior research, these variables are analyzed via the use of one way ANOVA test (Treena, Kelly & Woodford, 2012: 549; Becker, Kehoe & Tennent, 2007: 113; Eaves, 2009: 69). Former literature handles with comparably plain data sets, whereas the present study has many dimensions to consider. So, the authors decided to handle only the statistically significant results. Subsequent to ANOVA tests, cross tabulations are used in examining the perceptions of the students.

For the test applied for gender many items are found to be statistically significant. The males in the sample look much more decisive when compared to the females. The results revealed that men are not happy to be instructed compared to women. Also, women are more willing to do things in class and work with others. Males are reluctant to work with others, whereas females are happier with being told how to do something. Men are more capable of remembering things rather than reading and able to achieve more when the learning material is presented as a project and they also believe that they can achieve more when they work individually. The results of the ANOVA tests are presented in the appendix.

The ages of the students varied differently. So, the authors decided to group them in order to conduct the analysis in an easier way. The ages are grouped to 17-19 as fresh beginners, 20-22 advanced students and lastly 23-27 as mature groups. The mature ones are reported to be unhappy by being instructed in class and they are also unhappy for learning something by doing in class. Advanced students are found to be happier when they study in a group, whereas the fresh beginners are found to be happier when they see the learning material in the board. Besides these, advanced students are more capable when they are told how to make something and make a model. Whereas, mature students are reported to be eager to take part in projects, while fresh beginners are in role playing modes. Lastly, advanced students seems more capable of individual work, whereas the fresh beginners are happier when they work in a group.

Lastly, the cities are compared via ANOVA analysis and cross tabulations. Turkish government accepts the three cities in TR63 region for their similar attitudes. The results of the test verified this classification as the answers of students didn't resolved much. The findings imply that students in Hatay are not very happy for being in a group. Also, they are not willing to make drawings in the materials nor being lectured. However, the answers obtained from the samples in Kahramanmaraş and Osmaniye are more coherent.

4.6. Dimension reduction (Factor Analysis)

The present study employed a frequently used scale developed by Reid (1984:1). However, the number of items for different learning styles are numerous and there is need for assessment of the specific learning styles for syllabus development. So, in the light of the previous literature, the authors decided to conduct a two directional factor analysis (EFA and CFA) (Rita, Sabine, Kinshuk & Leo, 2007: 14). Initially, the data set is tested with exploratory factor analysis.

Table 4.4. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,831
Bartlett's Test of Sphericity	Approx. Chi-Square	18325,571
	df	435
	Sig.	,000

The results imply that efficient number of sample is obtained as the KMO Measure of Sampling Adequacy test score is 0.831. The total variance extracted is %75.384 which means that six the factors obtained has construct validity (Boyatzis & Kolb, 1995: 3; Poerksen, 2005: 478; Rita, Sabine, Kinshuk & Leo, 2007: 14; Eaves, 2009: 62). Statistical measures of this analysis is presented in the tables at appendix.

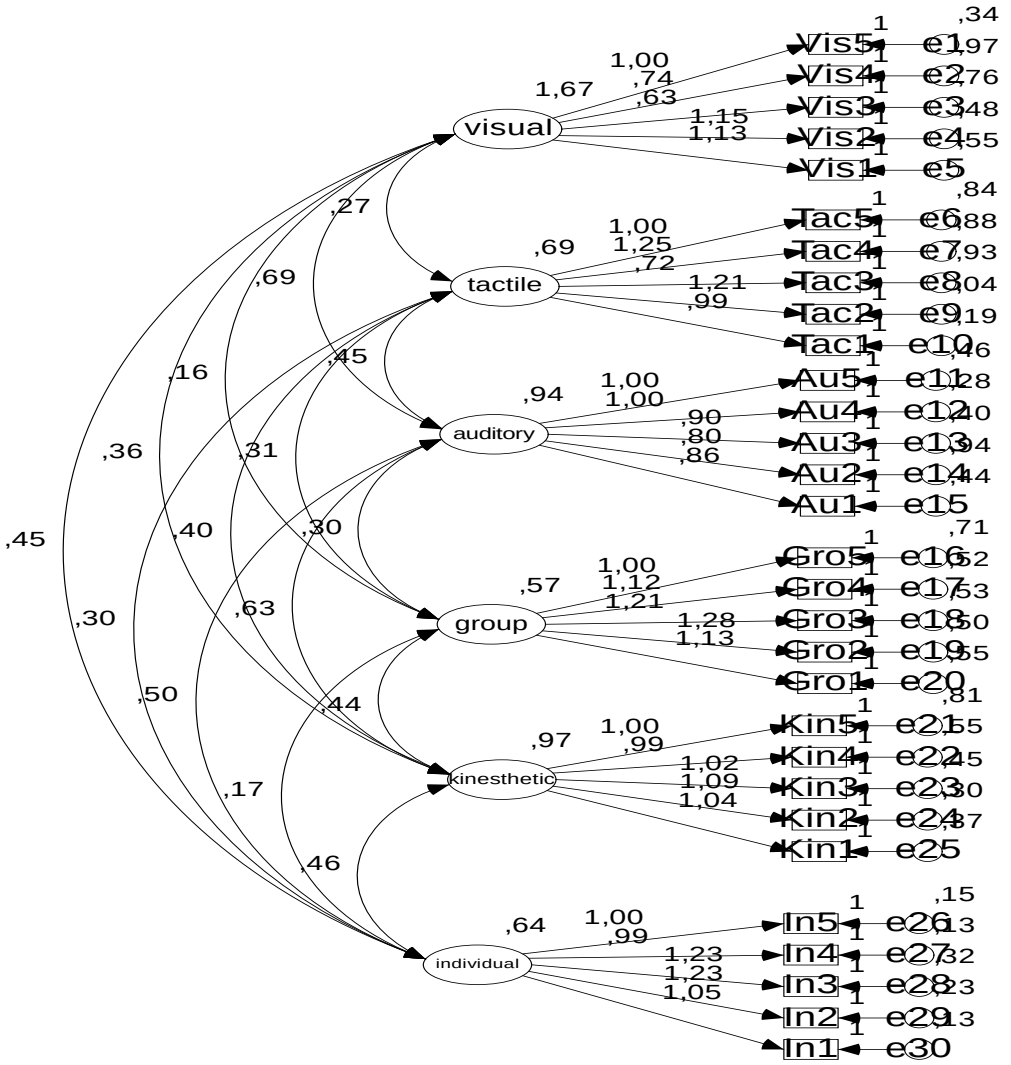
Table 4.5. Rotated Component Matrix[a]

	Component					
	1	2	3	4	5	6
Visual1		,924				
Visual2		,870				
Visual3		,584				
Visual4		,750				
Visual5		,833				
Tactile1						,729
Tactile2						,761
Tactile3						
Tactile4						,869
Tactile5						,860
Auditory1				,695		
Auditory2				,623		

Auditory3				,729		
Auditory4				,713		
Auditory5				,727		
Group1					,792	
Group2					,772	
Group3					,758	
Group4					,814	
Group5					,678	
Kinesthetic1			,717			
Kinesthetic2			,782			
Kinesthetic3			,801			
Kinesthetic4			,830			
Kinesthetic5			,580			
Individual1	,798					
Individual2	,822					
Individual3	,833					
Individual4	,891					
Individual5	,821					

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

The rotated component matrix shows that nearly all of the learning styles are differentiated. However, one item didn't provide decent factor load (0.5) and "Tactile3" should be omitted from the analysis. Besides EFA, Confirmatory Factor Analysis (CFA) is applied in order to see the exact differences and also if there is need for omitting "Tactile3". The results of CFA is depicted in Graph 4.1.



Graph 4.1. CFA results

Although the baseline comparisons are low (NFI: ,690; RFI: ,654; IFI: 704; TLI: 669 and CFI: 704; CMIN/df: 14,58; RMSEA: ,155) the model gives a great deal for the assessment of real factors. The relationships among factors tells a lot about the syllabi that can be derived from this study. For instance, the lowest covariance is obtained between individual and group learners. This finding should be taken into consideration while planning lectures. Besides these, the highest covariance is obtained between visual and group learners. The lecturers can take it into consideration and plan learning activities for groups by using visual materials.

Table 4.6. In-depth CFA Analysis Results

	NFI	*RFI*	*IFI*	*TLI*	*CFI*	*CMIN/df*	*RMSEA*
Visual/Tactile	0,951	0,908	0,953	0,912	0,953	17.508	0,169
Visual/Auditory	0,969	0,941	0,972	0,947	0,971	10.247	0,126
Visual/Kinesthetic	0,935	0,904	0,940	0,911	0,940	12.542	0,141
Auditory/Kinesthetic	0,935	0,913	0,942	0,924	0,942	7.777	0,108
Group/Kinesthetic	0,901	0,869	0,909	0,879	0,909	11.002	0,131

These findings imply that the CFA model should be fitted with data and in-depth analysis of the bivariate constructs are conducted. Statistically significant ones are depicted in Table 4.6. According to these findings the sample reports some kinesthetic activities besides visual, auditory and group activities. Besides these, tactile activities should be interpreted with visual materials.

4.7. Discussion

The analysis results demonstrate many useful implications for practitioners of language teaching. Parallel to the former literature, the findings can be used in generating for individualized syllabi (Entwistle, 2001: 596). Also, these findings can be used in deriving more personalized activities (Zajac, 2009: 257). The research had the limitation to gather information as the firm which is supposed to conduct surveys were inefficient and not able to give the dataset before the deadline. Thus, the researchers gathered the data by using their personal contacts.

The analysis revealed that;

- ✓ The authors were able to reach a good sample by means of its size and the quality of the data set;
- ✓ Descriptive statistics imply that the sample answered the questionnaire on purpose;
- ✓ Every variable has inter-item reliability;
- ✓ The inter-scale correlations verified parallel relationships with former studies;
- ✓ The ANOVA test proved some statistically significant tendencies differing according to age, sex and location;
- ✓ The factor analyses approved that a good sample size is attained. Furthermore, the theory of the research is verified and many implications for future research.

With this point of view, the present study revealed many useful information for the practitioners and theoreticians. They can make use of the inter-scale correlations and in-depth CFA analysis results for syllabus development.

5. CONCLUSION

This study aimed to determine the learning styles of university students at three different cities in the Turkish context. In order to do so, a detailed literature review is conducted. By doing so, the authors examined the theory, methodology and findings of the previous studies. Making use of the valuable accumulation, the authors were able to make sampling, measure development and analysis.

A questionnaire developed by Reid (1984: 1) is adapted and translated into Turkish. Academics made great contribution to the research by correcting and filling in the pre-test questionnaire forms (Papadopoulos, Demetriadis, Ioannis & Tsoukalas, 2010: 198). A randomly defined sample of 580 university students of three state institutions, filled in the questionnaire forms (Treena, Finney & Woodford, 2012: 547). The sample dynamics varied according to sex, age and location. The representation ratio is validated according to the general number of the students in the cities.

The analysis comprised initially some descriptive methods such as reliability and validity (Boyatzis & Kolb, 1995: 6; Treena, Kelly & Woodford, 2012: 549; Lawter, Rua & Guo, 2014: 586). The findings revealed that a good sample is achieved. The analysis maintained factor analysis affirming that the theory of the research is verified in a great extent (Rita, Sabine, Kinshuk & Leo, 2007: 14).

The findings proved that students perceive learning activities in different manners (Hawk & Lyons, 2008: 198; Boström & Lassen, 2006: 183). So, trainers can make use of them in order to boost performance in classes (Papadopoulos, Demetriadis, Ioannis & Tsoukalas, 2010: 203). Besides these there is evidence for future planning via learning styles. For instance, Becker & Tennent, (2007: 105) in agreement with Poerksen (2005: 471) imply that students can achieve more when they are aware of their learning styles. Moreover, this research indicated that learning styles may be an important consideration to be taken into account for students' future development (Chan & Mak, 2010: 44).

6. LIMITATIONS, ACKNOWLEDGEMENT AND IDEAS FOR FUTURE RESEARCH

As with all studies, there are some limitations associated with the present study (Eaves, 2010: 71). The results provide implications on the use of learning styles in the student sample at TR63 region. That's why there is need for new research on much bigger samples in order to generalize the findings. Moreover a male dominated sample is achieved which can't represent the whole. So, if practitioners are about to derive some evidence for development of new syllabi, they can make use of the same questionnaire on the target student groups and continue their work (Papadopoulos, Demetriadis, Ioannis & Tsoukalas, 2010: 209).

There is a call for some research on investigating in-depth relationships between different learning styles (Boström & Lassen, 2006: 179). Therewithal, there is need for qualitative and comparative research on the relationship between learning styles and academic achievements (Hawk &Lyons, 2008: 197). Lastly, the need for research on development of more personalized education programs are being addressed in the literature (Chan & Mak, 2010: 45).

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APPENDIX

ANOVA Gender

		Sum of Squares	df	Mean Square	F	Sig.
Visual1	Between Groups	45,447	1	45,447	17,252	,000
	Within Groups	1522,654	578	2,634		
	Total	1568,102	579			
Visual2	Between Groups	66,489	1	66,489	25,564	,000
	Within Groups	1503,311	578	2,601		
	Total	1569,800	579			
Visual3	Between Groups	37,723	1	37,723	27,460	,000
	Within Groups	794,020	578	1,374		
	Total	831,743	579			
Visual4	Between Groups	53,405	1	53,405	29,504	,000
	Within Groups	1046,243	578	1,810		
	Total	1099,648	579			
Visual5	Between Groups	23,696	1	23,696	11,951	,001
	Within Groups	1146,047	578	1,983		
	Total	1169,743	579			
Tactile2	Between Groups	4,365	1	4,365	4,156	,042
	Within Groups	607,047	578	1,050		
	Total	611,412	579			

ANOVA Gender

		Sum of Squares	df	Mean Square	F	Sig.
Tactile4	Between Groups	8,828	1	8,828	4,513	,034
	Within Groups	1130,584	578	1,956		
	Total	1139,412	579			
Tactile5	Between Groups	19,636	1	19,636	13,099	,000
	Within Groups	866,466	578	1,499		
	Total	886,102	579			
Auditory1	Between Groups	14,937	1	14,937	13,412	,000
	Within Groups	643,711	578	1,114		
	Total	658,648	579			
Auditory4	Between Groups	23,316	1	23,316	19,531	,000
	Within Groups	690,027	578	1,194		
	Total	713,343	579			
Kinesthetic2	Between Groups	19,558	1	19,558	13,768	,000
	Within Groups	821,082	578	1,421		
	Total	840,640	579			
Kinesthetic3	Between Groups	7,751	1	7,751	5,372	,021
	Within Groups	833,937	578	1,443		
	Total	841,688	579			
Kinesthetic5	Between Groups	23,101	1	23,101	13,254	,000
	Within Groups	1007,414	578	1,743		
	Total	1030,516	579			
Individual2	Between Groups	4,987	1	4,987	4,183	,041
	Within Groups	689,115	578	1,192		
	Total	694,102	579			
Individual3	Between Groups	10,853	1	10,853	8,575	,004
	Within Groups	731,499	578	1,266		
	Total	742,352	579			
Individual5	Between Groups	3,107	1	3,107	3,944	,048
	Within Groups	455,394	578	,788		
	Total	458,502	579			

ANOVA Age

		Sum of Squares	df	Mean Square	F	Sig.
Visual1	Between Groups	37,404	2	18,702	7,050	,001
	Within Groups	1530,697	577	2,653		
	Total	1568,102	579			
Visual2	Between Groups	21,351	2	10,675	3,978	,019
	Within Groups	1548,449	577	2,684		
	Total	1569,800	579			
Visual3	Between Groups	36,393	2	18,196	13,201	,000
	Within Groups	795,351	577	1,378		
	Total	831,743	579			
Visual4	Between Groups	134,252	2	67,126	40,120	,000
	Within Groups	965,396	577	1,673		
	Total	1099,648	579			
Visual5	Between Groups	49,712	2	24,856	12,805	,000
	Within Groups	1120,031	577	1,941		
	Total	1169,743	579			
Tactile1	Between Groups	6,864	2	3,432	4,012	,019

ANOVA Age

		Sum of Squares	df	Mean Square	F	Sig.
	Within Groups	493,578	577	,855		
	Total	500,441	579			
Tactile2	Between Groups	20,220	2	10,110	9,867	,000
	Within Groups	591,192	577	1,025		
	Total	611,412	579			
Tactile3	Between Groups	60,969	2	30,484	25,831	,000
	Within Groups	680,954	577	1,180		
	Total	741,922	579			
Tactile4	Between Groups	64,524	2	32,262	17,318	,000
	Within Groups	1074,888	577	1,863		
	Total	1139,412	579			
Tactile5	Between Groups	43,279	2	21,639	14,814	,000
	Within Groups	842,823	577	1,461		
	Total	886,102	579			
Auditory1	Between Groups	31,714	2	15,857	14,594	,000
	Within Groups	626,934	577	1,087		
	Total	658,648	579			
Auditory3	Between Groups	36,689	2	18,345	16,673	,000
	Within Groups	634,869	577	1,100		
	Total	671,559	579			
Auditory4	Between Groups	39,739	2	19,869	17,020	,000
	Within Groups	673,604	577	1,167		
	Total	713,343	579			
Auditory5	Between Groups	46,575	2	23,288	17,590	,000
	Within Groups	763,914	577	1,324		
	Total	810,490	579			
Group1	Between Groups	44,130	2	22,065	18,213	,000
	Within Groups	699,036	577	1,212		
	Total	743,166	579			
Group2	Between Groups	87,725	2	43,863	33,728	,000
	Within Groups	750,376	577	1,300		
	Total	838,102	579			
Group4	Between Groups	24,163	2	12,082	10,110	,000
	Within Groups	689,525	577	1,195		
	Total	713,688	579			
Kinesthetic1	Between Groups	96,128	2	48,064	38,198	,000
	Within Groups	726,037	577	1,258		
	Total	822,166	579			
Kinesthetic2	Between Groups	107,076	2	53,538	42,111	,000
	Within Groups	733,564	577	1,271		
	Total	840,640	579			
Kinesthetic3	Between Groups	105,601	2	52,800	41,389	,000
	Within Groups	736,087	577	1,276		
	Total	841,688	579			
Kinesthetic4	Between Groups	54,476	2	27,238	19,461	,000
	Within Groups	807,559	577	1,400		
	Total	862,034	579			
Kinesthetic5	Between Groups	111,315	2	55,658	34,937	,000
	Within Groups	919,200	577	1,593		
	Total	1030,516	579			
Individual1	Between Groups	61,409	2	30,705	41,844	,000
	Within Groups	423,391	577	,734		
	Total	484,800	579			
Individual2	Between Groups	66,327	2	33,164	30,481	,000

ANOVA Age

		Sum of Squares	df	Mean Square	F	Sig.
	Within Groups	627,775	577	1,088		
	Total	694,102	579			
Individual3	Between Groups	98,673	2	49,336	44,226	,000
	Within Groups	643,679	577	1,116		
	Total	742,352	579			
Individual4	Between Groups	27,743	2	13,871	19,683	,000
	Within Groups	406,635	577	,705		
	Total	434,378	579			
Individual5	Between Groups	37,158	2	18,579	25,443	,000
	Within Groups	421,343	577	,730		
	Total	458,502	579			

ANOVA City

		Sum of Squares	df	Mean Square	F	Sig.
Visual4	Between Groups	19,404	2	9,702	5,182	,006
	Within Groups	1080,244	577	1,872		
	Total	1099,648	579			
Group1	Between Groups	14,689	2	7,345	5,817	,003
	Within Groups	728,476	577	1,263		
	Total	743,166	579			
Group2	Between Groups	11,722	2	5,861	4,092	,017
	Within Groups	826,379	577	1,432		
	Total	838,102	579			
Group3	Between Groups	20,030	2	10,015	7,443	,001
	Within Groups	776,411	577	1,346		
	Total	796,441	579			

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	11,866	39,552	39,552	11,866	39,552	39,552	4,292	14,305	14,305
2	3,550	11,834	51,386	3,550	11,834	51,386	3,759	12,531	26,836
3	2,331	7,769	59,155	2,331	7,769	59,155	3,727	12,424	39,261
4	2,093	6,978	66,133	2,093	6,978	66,133	3,692	12,307	51,568
5	1,505	5,015	71,148	1,505	5,015	71,148	3,628	12,094	63,662
6	1,271	4,235	75,384	1,271	4,235	75,384	3,516	11,722	75,384
7	,918	3,060	78,443						
8	,778	2,595	81,038						
9	,681	2,271	83,309						

10	,607	2,023	85,333						
11	,536	1,788	87,120						
12	,478	1,595	88,715						
13	,420	1,401	90,116						
14	,360	1,200	91,316						
15	,352	1,173	92,489						
16	,313	1,044	93,533						
17	,283	,942	94,476						
18	,256	,853	95,328						
19	,254	,848	96,176						
20	,206	,688	96,864						
21	,195	,651	97,515						
22	,161	,538	98,053						
23	,131	,435	98,488						
24	,124	,414	98,902						
25	,097	,324	99,226						
26	,084	,279	99,505						
27	,061	,204	99,709						
28	,043	,145	99,854						
29	,025	,083	99,937						
30	,019	,063	100,000						