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An Empirical study of learning styles used by undergraduate English learners in public sector colleges in Pakistan

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Abstract. The current study aims at exploring the learning styles used by undergraduate English learners in public-sector colleges in Pakistan. The study is descriptive and expository as it uses the quantitative approach. There is dearth of empirical evidence in Pakistani context available to determine the learning styles used by undergraduate English learners, therefore, the current study is an endeavour to bridge the gap. There are normally three categories of English learners who study English at undergraduate level. These categories are based on the respective discipline of learners and categories are students of Arts (BA), students of Sciences (BSc.) and students of Commerce (BCom.). The current empirical study using the survey approach was conducted by adopting the questionnaire developed by Oxford and has been widely used across the globe to explore the area of learning styles. The close-ended questionnaire developed on 4-point likert scale was administered to a sample of 300 English learners. Stratified sampling was done as each category of learners comprised equal proportion of respondents i.e. 100 learners from each stratum. In order to analyse the data, the researchers used independent sample t test, ANOVA, and bivariate correlation. The findings reveal that male were more prone towards using visual, verbal, and interpersonal learning styles whereas female respondents were in favour of intrapersonal and aural style. There was significant difference in using learning style by the undergraduate English learners hailing from rural or urban background except in using physical learning where there was no significant difference. The results of One-way ANOVA on the base of economic background reveals that only significant difference was there in choosing interpersonal and intrapersonal learning style otherwise there was no statistical difference among other leaning styles. It is concluded from the study that the students of Arts and the students of Sciences have similar learning style choice while the choice of learning styles by students of Commerce were quite different. The study implicates that the findings of the study can be incorporated in dealing with each category of students in order to yield productive results.

Keywords: Learning Style, undergraduate learners, English, college

Introduction

Learning styles are the prime factor for learners to decide how they will learn something whether it is a language or something else. So, it is really important for them to use it to enhance their learning experience. There are various learning style typologies which are used in the world, but the current study will use VAK/VARK model of learning styles developed by Oxford (1996) as it is suitable to determine the learning styles of undergraduate learners. Other learning style models are more prone towards knowing the learning experience of professionals and learners in the process of becoming a professional. Oxford (1990) stated that there are six important types of learning styles, which are memory related, affective, cognitive, compensatory, social and metacognitive. There are multiple researches available to analyze the influence of different factors on the selection of learning styles; these factors are gender, cultural differences, age, stage of learning, proficiency, experience of learning, and aptitude (Rubin,

1975, et al., cited by Lee, 2010). The learners of English language make their learning better choose different learning styles whether consciously or based upon their unconscious efforts. In second language acquisition studies, it is shown that cultural influences are so deep that they influence choices of English learners in preferring certain learning styles (Oxford, 1996). The purpose of this study is to find out the learning styles chosen by the undergraduate English learners enrolled in public sector colleges in Lahore, Pakistan. It is also an effort to analyze whether there is any interdependence of learning styles so that the teaching methodology could be improved through the inclusion of such learning styles. In Pakistan, learners are not properly trained to determine their learning styles; hence, they are unable to use them to enhance their learning experience. The current study will not only determine the learning styles of undergraduate learners at different government colleges in Lahore but also try to find out the relationship of one learning style with another so that the learners could properly be trained to use different styles to augment their learning experience.

Literature Review

The teaching methods used in modern world are not applied in a proper manner in the Pakistani education system. This is the reason that the percentage of failure of the students is increasing day by day, so it provides a challenge to the teaching community about coping this problem of failure (Umar & Siddique, 2013). There is a common practice of using two types of teaching methods at most of the public sector colleges those are innovative and traditional teaching styles/methods. Innovative teaching methods are to involve students in the quest of learning so that they could be improved through the multiple activities used by the teacher (Khurshid & Ansari, 2012). It is good for the comprehension and an easy way to solve the issues of the students. Besides that, it supports the students to live further in their practical life (Boud & Feletti, 1997). Definitely, applying different techniques for knowledge transfer results in measured improvement in the learning potential of students in comparison to the traditional style of teaching where the task to simply complete the syllabus and get good results and there is no focus on the perception ability of the students which could be improved by using activities including learning styles which are good for the students' perception and learning (Doyle, 1993; Sajjad, 2009).

It is very surprising that some students get good marks others badly failed despite being taught by the same teacher, in the same classroom, having teaching system same for both kinds, even subjects and days for the course are same but still the difference. There are multiple factors which caused this difference. One should think what the best approach could be to bridge this gap so that all students perform equally well in the examination or at least as per the expectation of their teachers (Cernal & Pavliushchenko, 2015). It was found out by Moghadam & Cheraghian (2009), and Oxford (2003) that study habits of the students are not in the same order or in same quality which is the reason of their difference; hence, it is a need to be emphasized on students' process of studying in an effective manner. Despite perceived importance of the students' habits of studying to achieve academic results, the institutions are not paying attention to implement the factors which are helpful for the students (Baquiran, 2011).

Study habits are those habits which are developed by an individual regarding his activities for learning some kind of subject (Nagaraju, 2004; Oxford, 2003). Ways of students while practicing and exercising the abilities they have for learning are known as study habits used by the learners. Kohli (1977), and Oxford (1989) recommended that these habits should have practical as well as theoretical importance in any academic field. It is also reported in a study that good

relationship between performance and positive study habits are a guarantee for success in the subject of economics (Okpala, Okpala, & Ellis, 2000). It was also recommended that the study habits, attitudes, and skills can have good and positive effect on their grades (Crede & Kuncel, 2008). Blake (1954) noted that study skills training can be consequential for the good improvement in adopting study habits. In another study conducted on secondary level students found substantial association between study habits and academic achievement (Oxford, 1990; 2003; 2016; Fleming, 1995; 2012; Cherry, 2019).

Fleming in 1987 presented VARK model which is widely used in different academic scenarios to determine study habits/styles/strategies being used by the students in their studies. Oxford (1990) presented four different dimensions of learning strategies: Sensory preferences, personality types, desired degree of generality, and biological differences that was an extension to the model given by Fleming in 1987 as Fleming's model was only taking sensory preferences and considering learners on these domains: Visual, Auditory, Rearing & Writing, and Kinesthetics, this model is known as VARK model and widely used in psychology and applied linguistics to know the styles of learning by the students (Cherry, 2019).

Visual learners are those who feels easy to learn through pictures, illustrations, videos and diagrams but auditory learners are bound to remember things by hearing the information. Their way of learning is listening so audio tapes, recording and tapes are good source of their learning. Reading and writing learners are good at taking information displayed through texts or words; hence they are called reading and writing learners. The last category is kinesthetics who are good at actions. They learn the best through doing and touching something. Though there is enough criticism on VARK model and Oxford learning strategies model but VARK model is preferred in academia and considered a good measure to determine learning styles of the students (Fleming, 2012); (Cherry, 2019).

We can say that learners are important in any education model and in our country, it is badly needed to work out the ways to enhance the learning of the students. That is possible through knowing what kind of learners we mostly have in our colleges. So that the teachers could incorporate those activities which can support the learning styles of students. That might be finite, but its impacts are abundant. There is a need to discover that finite treasure within every learner in order to improve the learning of students. The current study is an effort to explore that finite treasure hidden in every learner so that one could achieve one's best.

The current research is designed for undergraduate English learners and the teachers teaching at undergraduate classes in public sector colleges at Lahore. It is to determine the learning styles used by undergraduate learners in learning their subjects and achieving good results. This could be helpful for them to determine their favoured learning styles which will be good for them to decide which learning style they should adopt for their learning to make it a habitual practice in their day to day requirement of learning. Teacher could get benefit out of this study through including such activities which promote the concerned learning styles in the related disciplines. It is also good the text book developers to add such practices in exercise section of their books to enhance the learners results and add good capital in academic economy of their country. Ultimately it is good for the academia to have good results and illuminate their annual funding and named in the good books of higher echelon. Education department could use this study to implement the activity in concerned colleges.

Research Methodology

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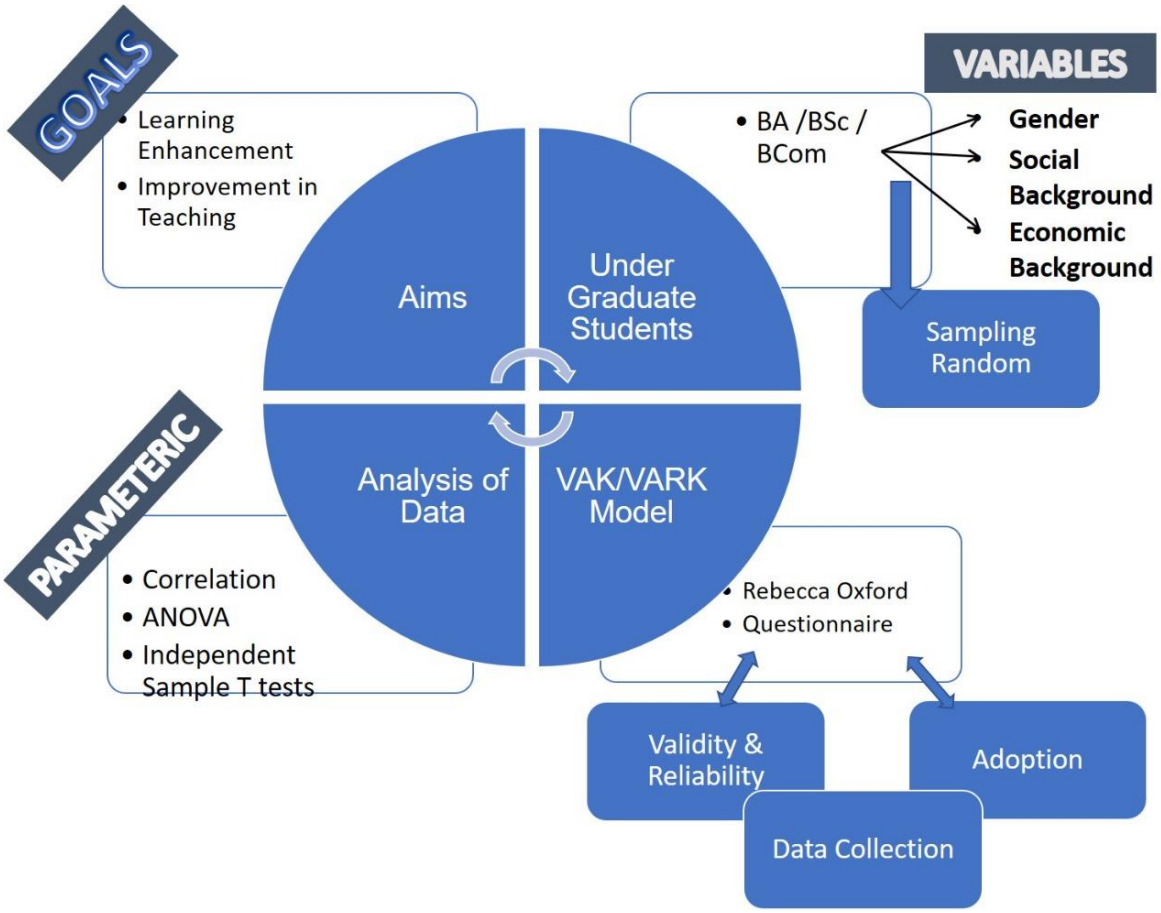
The current empirical study using the survey approach was conducted by adopting the questionnaire developed by Oxford and has been widely used across the globe to explore the area of learning styles. The close-ended questionnaire developed on 4-point likert scale was administered to a sample of 300 English learners. Stratified sampling was done as each category of learners comprised equal proportion of respondents i.e. 100 learners from each stratum. The samples belong to three different undergraduate strands available in public sector colleges i.e. students of Arts, students of Sciences, and students of Commerce. The researchers chose three independent variables to analyse their effect on the selection of learning styles: gender, social background and economic background.

Research Framework:



(Figure 1.1) not adopted

The data for the current study was collected from a sample of 300 undergraduate learners from government colleges of Lahore. The sample was selected on equal representation basis using stratified sampling. There were equal number of male and female (150 each) as well as equal number of learners from rural and urban background (150 each) while the representative ratio in terms of economic background was also in equal proportion. There were 100 respondents from low income parents, 100 from lower middle parents and 100 learners from economic background of middle middle parents. The representation of the discipline of students was also in equal proportion. Closed ended questionnaire based upon an adaptation of learning style battery by Oxford (1996) was used for collection of data. The reliability alpha value for the

Ilkogretim Online - Elementary Education Online, 2021; Vol 20 (Issue 5): pp. 1-12
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learning style battery was found to be 0.75 which is considered good in this kind of this kind of survey studies. In order to analyse the data, the researchers used independent sample t test, ANOVA, and bivariate correlation.

Results of the study

The purpose of the current study was to explore the learning styles used by undergraduate English learners in public-sector colleges in Pakistan. The demographic information which was collected from respondents comprised information regarding gender, social background, economic background and the category of their discipline. Table 1.1. shows the descriptive statistics of the learning styles adopted by the respondents in learning English language.

Table 1.1: **Descriptive statistics of leaning styles**

	N	Minimum	Maximum	Mean	Std. Deviation
Visual learning style	300	4.20	16.80	3.4427	3.96296
Aural learning style	300	4.20	17.00	0.3267	3.97106
Verbal learning style	300	4.20	16.80	1.4747	2.95973
Physical learning style	300	4.40	16.80	0.8653	2.84447
terpersonal learning style	300	4.20	16.80	2.4173	4.79054
trapersonal learning style	300	4.20	16.80	).1667	4.69427
Valid N (listwise)	300				

The above table clarifies that for all six learning styles the ratio at the minimum level was same i.e. 4.20 but the maximum was changed only for aural learning styles i.e. 17 otherwise the maximum level is same i.e. 16.80. The mean score shows that most of the learners' favourite style of learning is visual (13.44) then interpersonal (12.42) and at 3rd is verbal learning style (11.47). Aural and physical learning styles have almost the same mean score i.e. 10.86 for physical and 10.33 for aural. Intrapersonal seems to be the less favoured style of learning as its mean score 9.17 shows.

Table 1.2: Independent sample t test: **Gender wise difference in learning styles**

Learning Style	Gender	N	Mean	Std. Deviation	T Value	Sig. (2-tailed)
Visual	Male	150	14.1813	3.21065	2.316	.022
	Female	150	12.7040	4.49533		
Aural	Male	150	9.4160	3.68338	-2.876	.005
	Female	150	11.2373	4.06244		
Verbal	Male	150	12.0587	3.05637	2.457	.015
	Female	150	10.8907	2.75785		
Physical	Male	150	11.0133	2.82562	.636	.526
	Female	150	10.7173	2.87451		
Interpersonal	Male	150	13.9307	3.98409	4.066	.001
	Female	150	10.9040	5.06886		
Intrapersonal	Male	150	7.8080	3.96572	-3.692	.001
	Female	150	10.5253	4.99013		

Male and female are not significantly different in using physical learning styles as the 2-tailed value is greater than .05 i.e. the cut value of significance; here the means are showing that male learners are more prone towards using physical style than the female learners as the means

Ilkogretim Online - Elementary Education Online, 2021; Vol 20 (Issue 5): pp. 1-12
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11.01 and 10.71 with the std. Deviation 2.82 and 2.87 respectively of both genders are telling us. Other than this in all the learning styles male and female are significantly different. The means of male and female in using visual style are 14.18 and for female 12.70 with significant value of .022, and for verbal style it is 12.06 for male and 10.89 for female with the significant value of .015, and in interpersonal style male are 13.93, female are 10.90 with the 2-tailed value of .001, which means that in these styles male are more favouring than the female. Whereas in aural male are 9.41, female are 11.27 with the significant value of .005 and same happened in intrapersonal style where male are 7.81 and female are 10.52 with the significant value of .001 which means these styles are favoured by female more than male learners.

Table 1.3: Independent sample t test: **Difference of social background in adopting learning styles**

Learning Style	S. Bk gr	N	Mean	Std. Deviation	T Value	Sig. (2-tailed)
Visual	Urban	150	12.7040	4.49533	-2.316	.022
	Rural	150	14.1813	3.21065		
Aural	Urban	150	11.2373	4.06244	2.876	.005
	Rural	150	9.4160	3.68338		
Verbal	Urban	150	10.8907	2.75785	-2.457	.015
	Rural	150	12.0587	3.05637		
Physical	Urban	150	10.7173	2.87451	-.636	.526
	Rural	150	11.0133	2.82562		
Interpersonal	Urban	150	10.9040	5.06886	-4.066	.001
	Rural	150	13.9307	3.98409		
Intrapersonal	Urban	150	10.5253	4.99013	3.693	.001
	Rural	150	7.8080	3.96572		

Independent t test was applied to know the different of using learning style by the learners of having rural or urban social background, which rendered the above table. As per the results there is a significant difference in adopting different learning styles by the learners belong to rural background or urban background except in using physical learning style in which there is no significant difference which is shown by the significant value of .526 which is higher than the cut value of .05, it is also proved from the mean different i.e. .29 which is very minutely tilted towards more rural learners as its negative t value is also showing the same thing. The negative t value of visual, verbal, and interpersonal learning styles is also showing that rural learners are more prone towards these styles as there mean values are for visual 14.18 with the significant value of .022, for verbal, 12.06 with the p value of .015 and for interpersonal it is 12.93 with the p value of .001. Mostly urban learners are in favour of using aural, and intrapersonal learning styles as their mean values are for Aural 11.24 with the significant value of .005 and for intrapersonal it is 10.52 with the p value of .001.

Table 1.4: **One Way ANOVA Test for effect of Economic background in using learning styles**

Group Statistics (Descriptive) **ANOVA Main**

		N	Mean	evene Stat. Sig.		f Squares	uare			
Visual	10-20k	100	13.2640	.027	etween Groups	6				

Ilkogretim Online - Elementary Education Online, 2021; Vol 20 (Issue 5): pp. 1-12
http://ilkogretim-online.org.tr
doi: 10.17051/ilkonline.2021.04.01

	20-30k	100	13.8280		Within Groups	891	
	30k<	100	13.2360		Total	047	
Aural	10-20k	100	11.1560	.458	Between Groups	1	
	20-30k	100	9.9200		Within Groups	042	
	30k<	100	9.9040		Total	633	
Verbal	10-20k	100	11.1920	.946	Between Groups		
	20-30k	100	11.7680		Within Groups	941	
	30k<	100	11.4640		Total	244	
Physical	10-20k	100	10.8880	.191	Between Groups		
	20-30k	100	10.7440		Within Groups	311	
	30k<	100	10.9640		Total	560	
Inter-personal	10-20k	100	11.2360	.001	Between Groups	06	
	20-30k	100	14.2280		Within Groups	929	
	30k<	100	11.7880		Total	435	
Intra-personal	10-20k	100	10.5680	.001	Between Groups	30	
	20-30k	100	7.4160		Within Groups	863	
	30k<	100	9.5160		Total	393	

0.01 = small, 0.06 = medium, 0.13 = large (Cohen, 1987 effect size for eta squared calculation)

A one-way between groups analysis of variance was conducted to explore the impact of economic background on using learning style out of six different styles. Participants were divided into three groups according to their economic background (10-20k/pm, 20-30k/pm, more than 30k/pm). There was a statistically significant difference for using interpersonal and intrapersonal learning styles for three different backgrounds F (2, 147) = 0.59, p > .003; F=(2, 141)=6.26, p > .002 respectively. Despite reaching statistical significance in these two learning styles, the actual difference in mean scores between groups was quite small but effect size calculated using eta squared is medium with .07 and .08. Post-hoc comparisons using the descriptive indicated that the mean score for <20k(M=11.23), <30k (M=14.22) and 30k<(M=11.78) for interpersonal; <20k(M=10.56), <30k (M=7.42) and 30k<(M=9.52) for intrapersonal were significantly different from each other shown by the Levene Statistics Sig. of .001 for both styles. The other learning styles are not significantly different as their p values are .704, .196, .626, .927, respectively for visual, aural, verbal and physical. The mean different between groups was quite small and the effect size calculated by eta squared is also small as it was .005, .02, .006, .001 respectively for the four learning styles. The mean score for visual <20k(M=13.26), <30k (M=13.83) and 30k<(M=13.24) with Lavene significance of .027, aural <20k(M=11.16), <30k (M=9.92) and 30k<(M=9.9) with Lavene p value of .458, verbal <20k(M=11.19), <30k (M=11.77) and 30k<(M=11.46) with the Lavene significance of .946, physical <20k(M=10.89), <30k (M=10.74) and 30k<(M=10.96) with Lavene p value of .191 which shows there is insignificant difference.

Table No 1.5: **Correlations matrix of interdependence of learning styles**

	Learning styles	Visual	Aural	Verbal	Physical	Inter-Personal	Intra-personal
Visual	P Correlation	1	-.682**	.323**	.091	.234**	-.230**
	Sig. (2-tailed)		.000	.000	.270	.004	.005
	N	300	150	150	150	150	150
Aural	P Correlation	-.682**	1	-.494**	-.108	-.223**	.231**
	Sig. (2-tailed)	.000		.000	.188	.006	.004

Ilkogretim Online - Elementary Education Online, 2021; Vol 20 (Issue 5): pp. 1-12
http://ilkogretim-online.org.tr
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	N	300	150	150	150	150	150
Verbal	P Correlation	.323**	-.494**	1	.386**	.160	-.170*
	Sig. (2-tailed)	.000	.000		.000	.050	.037
	N	300	150	150	150	150	150
Physical	P Correlation	.091	-.108	.386**	1	-.078	.084
	Sig. (2-tailed)	.270	.188	.000		.340	.307
	N	300	150	150	150	150	150
Inter-Personal	P Correlation	.234**	-.223**	.160	-.078	1	-.915**
	Sig. (2-tailed)	.004	.006	.050	.340		.000
	N	300	150	150	150	150	150
Intra-Personal	P Correlation	-.230**	.231**	-.170*	.084	-.915**	1
	Sig. (2-tailed)	.005	.004	.037	.307	.000	
	N	300	150	150	150	150	150

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Correlation matrix was applied on using learning styles by the undergraduate learners at public sector colleges to analyse the interdependence of learning styles which rendered the above shown table. The table shows that visual learning style is strongly correlated with all other learning styles except physical style as it has insignificant difference of showing p value of .270. Aural leaning style is also strongly negatively correlated with all learning style except physical here its p value is .188. Verbal style is strongly correlated with visual, aural, and physical but weakly correlated with intrapersonal except intrapersonal where is has no strong or weak correlation. Though it is showing significant value for interpersonal learning style that is .05. The physical learning style is only strongly correlated with verbal style as its insignificant values are showing i.e. for visual .27, for aural .18, for interpersonal .34 and for intrapersonal .31. Interpersonal learning style is also strongly correlated with visual, aural, and intrapersonal. It is also not correlated with verbal and physical where it has significance values of .05 and .34 which are showing insignificant difference among these three styles. The last intrapersonal learning style is strongly correlated with visual, aural, and interpersonal and weakly correlated with verbal learning style. It is not correlated with physical learning style.

Table 1.6: **One Way ANOVA Test for adoption of learning styles by undergraduate learners**

Group Statistics (Descriptive) **ANOVA Main**

		N	Mean	evene Stat. Sig.		of Squares	a Square	Df		
Visual	BA	100	14.7160	.001	etween Groups	199.396	.08	2	5	
	BSc	100	13.6880		Within Groups	2140.651		147		
	BCom	100	11.9240		Total	2340.047		149		
Aural	BA	100	8.7600	.001	etween Groups	196.900	.08	2	3	
	BSc	100	10.7520		Within Groups	2152.734		147		
	BCom	100	11.4680		Total	2349.633		149		
Verbal	BA	100	12.4520	.660	etween Groups	102.330	.07	2	3	
	BSc	100	11.5400		Within Groups	1202.914		147		
	BCom	100	10.4320		Total	1305.244		149		
Physical	BA	100	11.3400	.860	etween Groups	41.500	.03	2		

Ilkogretim Online - Elementary Education Online, 2021; Vol 20 (Issue 5): pp. 1-12
http://ilkogretim-online.org.tr
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	BSc	100	11.1240		Within Groups	1164.060		147)
	BCom	100	10.1320		Total	1205.560		149
r-personal	BA	100	13.2080	.001	etween Groups	240.097	.07	2 1
	BSc	100	13.4120		Within Groups	3179.338		147
	BCom	100	10.6320		Total	3419.435		149
a-personal	BA	100	8.2320	.001	etween Groups	185.204	.05	2 1
	BSc	100	8.5400		Within Groups	3098.190		147
	BCom	100	10.7280		Total	3283.393		149

0.01 = small, 0.06 = medium, 0.13 = large (Cohen, 1987 effect size for eta squared calculation)

A one-way between groups analysis of variance was conducted to explore the impact of discipline on adopting from six different learning styles. Participants were taken from three different undergraduate disciplines (BA, BSc, and BCom). There was a statistically significant difference for selecting all learning styles except in physical style F (2, 147) = 6.85, p > .001 for visual; F=(2, 147)=6.72, p > .002 for aural; F=(2, 147) = 6.25, p> .002 for verbal; F=(2, 147) = 5.55, p > 005 for interpersonal; and for intrapersonal it is F=(2, 147) = .014. In all these five learning styles, the actual difference in mean scores between groups was quite small but effect size calculated using eta squared is medium i.e. between .07 and .08 only for intrapersonal effect size is small where it is .05. Post-hoc comparisons using the descriptive indicated that the mean score for for visual BA(M=14.71), BSc(M=13.69) and BCom(M=11.92) with Lavene statistics of .001; for aural BA(M=8.76), BSc(M=10.75) and BCom(M=11.46) with Lavene significant score of .001; for interpersonal BA(M=13.20), BSc(M=13.41) and BCom(M=10.63) with Lavene significant score .001; for intrapersonal BA(M=8.23), BSc(M=8.54 and BCom(M=10.72) with Lavene significant score .001, here the score is significant. The learning style with insignificant difference are verbal BA(M=12.45), BSc(M=11.54) and BCom(M=10.43) with Lavene significant score .660; and physical BA(M=11.34), BSc(M=11.12), and BCom(M=10.13) with Lavene significance .860. The mean different between groups was quite small and the effect size calculated by eta squared is also medium for verbal i.e. .07 and small for physical i.e. .03.

Findings and Conclusion of the study

The major research findings of the current study are:

1. Male undergraduate learners are more favoring visual, verbal and interpersonal learning styles
2. Female learners are in favor of aural and intrapersonal learning styles.
3. There was no significant difference in using physical learning style between male and female learners
4. There was also significant difference in using all learning styles by the learners having rural or urban social background.
5. Use of physical learning style was same for the learners whether from urban or rural background.
6. Based upon the difference of economic background the learners have only significant difference in choosing interpersonal and intrapersonal learning style.
7. Other learning style selection has no impact of economic background of undergraduate learners.
8. Visual and interpersonal learning styles have strong correlation and interdependence.
9. Verbal and physical learning styles have no interdependence, not on each other nor on any other learning style.

10. Results also show that interpersonal and intrapersonal learning styles have strong correlation but that is due to the outlier tendency.
11. BA and BSc learners have almost same choice for learning styles but Bcom learners have difference choices except in choosing aural where the choice of BSc and BCom learners is same.
12. Interpersonal and intrapersonal learning styles are not favored by BCom learners.

The study was designed with the purpose of investigating the learning styles of the undergraduate learners learning at public sector colleges at Lahore, and whether any interdependence is available among different learning styles. The questionnaire developed by Rebecca Oxford was adopted and adapted based upon cultural norms. The study concludes that social background has significant effect on selection of learning styles but economic background does not affect in selection of learning styles. Gender difference has strong effect on the choice of which learning style should be adopted to learn in a better way. It was also concluded that students of Arts as well as Sciences of English have similar choices for different learning styles, but Commerce learners of English are different in their point of view as interpersonal and intrapersonal styles are totally rejected by them.

Recommendation

The study recommends that:

1. The teachers of undergraduate classes should encompass activity based upon their favored learning styles so that their learning could be improved.
2. The learners should adopt these learning styles to learn in a better way.
3. If the heads of department might conduct a kind of workshop of how to adopt such kind of activities in the undergraduate classes by their respective teachers the results could be improved a lot.
4. The teaching methodology at public sector colleges at Lahore should be improved through the inclusion of respective activities for the concerned undergraduate disciplines.
5. The textbook boards should include exercises at the ends of chapters based upon the activities having the favored learning styles by the undergraduate learners of different disciplines.

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