

**ASSOCIATION BETWEEN AGE AND LEARNING STYLE  
PREFERENCES -EXPERIENTIAL EVIDENCE PERTAINING TO  
STUDENTS OF PG AND UG BACKGROUND**

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**ABSTRACT**

*Learning is a lifelong process and age is no bar for learning. Human beings will have several styles of learning preferences in acquiring the knowledge. This paper makes an earnest attempt to understand Association between age and learning style preferences of students of PG and UG Background. The study makes use of Fleming's VARK learning model to understand the learning style preferences of the respondent students. The study also gives an insight regarding the importance of understanding the learning styles by the students so as to make learning effective and useful. VARK inventory provides a valuable measure of learning style as it directly assesses how students prefer to learn, rather than indirectly predicting their learning strengths through a personality assessment. Age is neither a barrier to learn nor a facilitator, but certainly gives maturity to the students to understand their innate learning styles. Understanding one's learning style makes the learning effective and meaningful. The combination of learning styles viz., Visual, Auditory, Read-write and Kinesthetic may be better from all practical perspective to make the learning a pleasurable exercise.*

**Key Words:** Visual, Auditory, Read-write, Kinesthetic, VARK inventory, Uni-modal, Multi-modal

**Introduction**

Learning is a lifelong process and age is no bar for learning. Human beings will have several styles of learning preferences in acquiring the knowledge. Learning styles are a popular concept in psychology. Education is supposed to identify how people learn best. In this respect, the

concept of learning styles remains extremely popular. Kolb's model of learning styles is one of the best-known and widely used learning style theories. Kolb (1984) developed a theory of experiential learning and a learning style inventory. He believed that our individual learning styles emerge due to our genetics, life experiences, and the demands of our current environment. Kolb (2001) explained four different learning styles. Mark K. Smith (2001) argued that Kolb's model was supported only by weak empirical evidence and that the learning process was actually far more complex than the theory suggested. He also noted that the theory failed to fully acknowledge how different experiences and cultures might impact the learning process. Another learning style theory was based on the work of analytical psychologist Carl Jung, who developed a theory of psychological types designed to categorize people in terms of various personality patterns. Jung's theory focused on four basic psychological functions: viz., Extraversion vs. Introversion, Sensation vs. Intuition, Thinking vs. Feeling, and Judging vs. Perceiving (Kendra Cherry, 2010). This theory later led to the development of the now-famous Myers-Briggs Type Indicator. Person's learning style might include elements of extroversion, sensing, feeling, and perceiving learning styles. In 1987, Fleming developed an inventory designed to help students and others learn more about their individual learning preferences (Fleming, N.D. & Mills, C. 1992). In this respect Neil Fleming's VARK model is one of the most popular representations to understand the learning preferences of the individuals. This paper makes an earnest attempt to understand Association between age and learning style preferences of students of PG and UG Background. The study makes use of Fleming's VARK learning model to understand the learning style preferences of the respondent students. The study also gives an insight regarding the importance of understanding the learning styles by the students so as to make learning effective and useful. The study relies on the VARK inventory to assess learning styles. This inventory provides a valuable measure of learning style as it directly assesses how students prefer to learn, rather than indirectly predicting their learning strengths through a personality assessment.

There are many methods available for assessing learning styles, with each method offering a distinctly different view of learning style preferences. The method used in this study defines the preference in learning style in terms of the sensory modality in which a student prefers to take in new information. Four sensory modalities of learning have been defined: visual, auditory, read-

write and kinesthetic (Forest, 2004). Visual learners prefer the use of symbolic devices such as diagrams, graphs, flow charts and models that represent printed information. Auditory learners prefer to hear information and, thus, learn better through discussions, lectures, tutorials and talking through material with themselves or others. Read-write learners prefer printed words and texts as a means of acquiring new information; they thus prefer textbooks, lecture notes, handouts, lists and glossaries. Kinesthetic learning employs a combination of sensory functions; such learners have to feel or live the experience to learn; they prefer simulations of real practices and experiences, lessons that emphasize on performing an activity, field trips, exhibits, samples, photographs, case studies, real-life examples, role-plays, and applications to help them understand principles and advanced concepts. The learning style can be assessed by using the visual, auditory, read/write and kinesthetic (VARK) questionnaire developed by Neil Fleming. The validity of the VARK model as well as other learning style theories has been questioned and criticized extensively. One large scale look at learning style models suggested that the instruments designed to assess individual learning styles were questionable, while other critics have suggested that labeling students as having one specific learning style can actually be a hindrance to learning. Despite the criticism and lack of empirical support, the VARK model remains fairly popular among both students and educators. Many students immediately recognize that they are drawn to a particular learning style. Others may find that their learning preferences lie somewhere in the middle. For example, a student might feel that both visual and auditory learning is the most appealing. The excerpts of other authors who have done substantial work in learning style of the students are given below.

Learning style is defined as the composite of characteristic cognitive, affective and physiological characters that serve as relatively stable indicators of how a learner perceives, interacts with, and responds to the learning environment (Baykan Z, Nacar M, 2007). Educational researchers postulate that each individual has a unique learning style (Murphy RJ, et. al, 2004). Students learn best when teaching methods match their learning style. Researchers in other fields have studied the impact of learning styles on student performance in introductory courses (see, for example Bartlett, Hallock, Kellogg *et al* 1996, and Thomas *et al* 2002). Their results are mixed; some conclude that learning style can impact Student success, while others find no significant relationship. Charkins et al (1985) searched for a link between teaching styles and learning

styles, and tried to identify any impact of such a link on student learning. These authors use a questionnaire that classifies teacher and student learning as dependent, independent or collaborative. Borg and Shapiro (1996) use the Myers-Briggs Type Indicator (MTBI) to evaluate macroeconomic principles students and professors to see if personality type affects student grades and if students with personality types similar to those of their professor perform better. They conclude that students whose personality type suggests a preference for a structured learning environment perform significantly better in macroeconomic principles courses than those whose personality type suggests a preference for either independent learning or extensive interaction during class. In addition, consistent with Charkins *et al* (1985), these authors find that students who share a personality type with their professor perform significantly better. Ziegert (2000) tests the hypothesis that faculty and student personality types affect student abilities to understand economics, as measured by the TUCE (Test of Understanding of College Economics) and course grade. Like Borg and Shapiro, she uses the Myers-Briggs personality type indicator and finds that "thinking" students (those that make objective judgments) outperform feeling "students" (those that make decisions based on personal values). Her research also suggests that "intuitive" students (those that focus on the larger picture prior to details and learn from insight) outperform "sensing" students (those that prefer experience-based learning). Ziegert(2000) finds no evidence of a gender gap in her study; once personality differences have been accounted for. Gender is not a statistically significant predictor of success in economics. Finally, contrary to Borg and Shapiro (1996) and Charkins *et al* (1985), Ziegert's (2000) research does not suggest that commonality between instructor and student personality type improves student performance.

. By analyzing the literature in the area of VARK learning styles, there exists a wide gap in the area of micro study on learning styles of students at the PG and undergraduate levels and the association of learning style with the age of the students.

### **Relevance of VARK and Achievable Result**

The VARK questionnaire developed by Neil Fleming (1995) version 7.0 has sixteen questions that generate the profile of modal preferences regarding information processing, presentation and learning. These preferences are about the ways in which they want to take-in and give-out information. The modalities are: visual, aural/auditory, read/write, and kinesthetic. Each VARK

question presents a situation likely to be within the respondent's experience and asks him to select from among alternative actions. Each answer represents a modal preference. Respondents may select multiple answers and all answers are counted. The questionnaire was developed to identify which sensory modalities subjects prefer to employ when learning or presenting information.

Students are able to explore their weaker preferences and enhance them by using all the VARK strategies associated with them. A student with a strong Read-Write preference might learn to use visual strategies for note-taking or expressing his or her learning. A student with a strong Visual preference might attend a course to assist with kinesthetic ways of taking information in or for expressing it. VARK provides students with an indication of their preferences for learning and as such it will indicate stronger and weaker preferences. Some students seek opportunities to learn new strategies at every opportunity that is not general. Application of VARK also helps them in venturing in to unknown areas where the opportunities and challenges are more in terms of learning and growth.

### **Statement of the problem**

There is a strong intuitive appeal in the idea that teachers and course designers should pay closer attention to students' learning styles by diagnosing them, by encouraging students to reflect on them and by designing teaching and learning interventions around them. However aligning teaching strategies to learning styles may or may not be effective as the research has found that matching teaching methods to learning styles had no influence on educational outcomes. Students need to find that understanding their own learning preferences is very important. However, the students fail to make a deep understanding of the concept as they are not aware of their true learning styles. The superficial understandings of the subjects make them struggle in the examination as they come out with poor performance. Once students are no longer struggling with a subject as they know how to prepare for it, they will feel better about themselves and won't be stressed out about tests or papers. Keeping this view in mind, study focuses on the learning style and preferences of students. The study also tries to understand the relationship between the age of the students and their learning style preferences.

## **Objectives**

Keeping the above problem areas in mind, the study, 'Association between age and learning style preferences -experiential evidence pertaining to students of PG and UG Background' is carried on with the following objectives.

1. To compare the learning style of the students assessed by self and through VARK
2. To understand the learning preferences of the students by understanding the strength of the learning modes
3. To understand the association between age and learning modes adopted by the students
4. To understand the correlation between the age and mean marks of three exams, viz., SSLC, PUC and University exam marks
5. To understand the relationship between the marks scored by PG and UG students in SSLC, PUC and University exams and their VARK mode

Some learners have a preference for any one of these learning modalities (uni-modal learners), whereas multimodal learners do not have a strong preference for any single method. They rather learn via two or more of the modalities. Multimodal learners thus are sub-classified as bi-, tri-, and quad-modal learners, who prefer to use two, three, or four styles, respectively (Fleming, N.D. & Mills, C. 1992).

## **Methodology**

The study is a micro study and has been confined to Mangalore region of Dakshina Kannada District of Karnataka state, India. The study was conducted in PG departments of the affiliated colleges as well as the UG departments in Mangalore. The responses were received from 250 UG students and 250 PG students. The UG students comprised of Engineering graduates from the Electrical, Electronics, Mechanical and civil background. The PG students are comprised from M.Com, MBA, Journalism and MCA background. The sample respondents were interested in finding out their learning style as per VARK and took interest in filling the questionnaire promptly. The questionnaire VARK version 0.7 developed by Neil D. Fleming (2001) with 16 questions to test the learning styles and preferences was administered to students. The

permission was taken from Neil Fleming as the study was making use of the copyright version of the VARK questionnaire developed by him. Along with the VARK questionnaire another structured questionnaire was also prepared to understand the background of the students. The questions were asked to understand their scoring pattern in SSLC (X<sup>th</sup> STD), PUC as well as University marks. The nature of the students in matching their study habits to their learning preferences was also understood. Influence of gender in learning style preferences were assessed. SPSS version 21 was used and t-test, Chi-square, ANOVA, Pearson's Correlation and Regression analysis were applied to analyze the data.

### **Findings and Discussion:**

**1. VARK style, learning style assessed by self and the strength of VARK style:** The Table 5 states certain important observations such as VARK style, learning style assessed by self and also the strength of VARK style. There is some gap between VARK style according to the study developed by Neil D Fleming and the learning style assessed by self in real terms. Respondents who have opted for all four modes of learning such as Visual, Auditory, Reading and Kinesthetic learning styles in different combinations were 128 but according to the self assessment VARK mode were adopted by 64 respondents. Respondents who fell in the category of K, A, R, V were 52, 98, 27 and 03 respectively through VARK study though the self assessment of learning for K, A, R, V comprised of 36, 24, 69 and 44 respondents which leaves a substantial gap between VARK assessment and self assessment. There is little research on the quality, reliability of the VARK questionnaire. However, in their review of learning style instruments Hawk and Shah (2007) note that the VARK model is the only one of five studied that contains the read/write and kinesthetic dimensions. According to the VARK website 58 percent of individuals report a match between the questionnaire results and their own perceptions of learning preferences. This finding corroborates the finding of the present study that either there could be some bias by the respondents in responding or as the VARK study takes in to account the learning styles in various permutations and combinations it feels that there is gap in real assessment and VARK assessment of learning style.

The findings also state that 317 respondents were multimodal and 183 respondents were uni-modal with mild, strong and very strong attributes. These results are based on the Algorithm

developed by Fleming for interpreting the VARK score. It says that if the difference between the scores for the respondent's highest and the next highest mode score is 2, 3, 4 and 5 the preference is 'mild', the difference score 4, 5, 6 and 7 the preference is 'strong', the difference score 6, 7, 8 and 9 the preference is 'Very Strong' viz- a- viz the total VARK score that lies between 14 and 21, 22 and 27, 28 and 32 and 32 and above respectively. VARK scoring system is preferable to those of other learning style inventories. According to Boatman, Courtney, and Lee (2008) as the study distinguishes between mild, strong and very strong preferences, we can assess the importance not only of learning style preference, but that of preference strength. Second, the scoring system identifies respondents with multimodal preferences, rather than forcing them into a particular category. This scoring feature adds a subtle dimension to the inventory that is lacking in other learning style assessment methods. Thus the present study has categorized respondents based on their preference towards 'mild', 'strong' and 'very strong' as well as multimodal preference.

**Table 1: Descriptives on VARK style, learning style (self) and the strength of VARK style**

VARK style	Frequency	Per cent	Self style	Frequency	Per cent	Strength of VARK	Frequency	Per cent
AK	1	.2	A	24	4.8	Multimodal	317	63.4
K	52	10.4	AK	20	4.0	Mild 'A'	68	13.6
A	98	19.6	AR	10	2.0	Mild 'K'	42	8.4
AK	28	5.6	AV	2	.4	Mild 'R'	24	4.8
AKR	8	1.6	K	36	7.2	Mild 'V'	1	.2
AKRV	17	3.4	KA	4	.8	Strong 'A'	10	2.0
AKV	7	1.4	KV	1	.2	Strong 'K'	20	4.0
AKVR	27	5.4	R	69	13.8	Very strong 'A'	15	3.0
AR	13	2.6	RK	18	3.6	Very strong 'R'	3	.6
ARK	18	3.6	RV	1	.2	Total	500	100.0
ARKV	23	4.6	V	44	8.8			
ARVK	9	1.8	VA	44	8.8			
AV	2	.4	VAK	18	3.6			
AVK	1	.2	VAR	29	5.8			
AVKR	6	1.2	VARK	64	12.8			
AVR	2	.4	VK	39	7.8			
AVRK	7	1.4	VR	72	14.4			
KA	14	2.8	VRK	5	1.0			
KAR	6	1.2	Total	500	100.0			
KARV	18	3.6						

KAV	3	.6
KAVR	4	.8
KR	7	1.4
KRA	4	.8
KRAV	8	1.6
KRVA	7	1.4
KVA	7	1.4
KVAR	9	1.8
R	27	5.4
RAK	4	.8
RAKV	2	.4
RAVK	8	1.6
RK	3	.6
RKA	3	.6
RKAV	7	1.4
RKVA	6	1.2
RVAK	6	1.2
RVKA	1	.2
V	3	.6
VA	5	1.0
VAK	5	1.0
VARK	4	.8
VK	1	.2
VKA	5	1.0
VRK	3	.6
VRKA	1	.2
Total	500	100.0

**2. Learning preferences of the students through the strength of learning modes:** Table 2 shows that the students learning preferences can be assessed through the strength of the learning modes. Students who opted for unimodal learning preferred just one of the learning styles viz., Visual, Auditory, Read-write and Kinesthetics. In the present study students preferred mostly Auditory style followed by Kinesthetics. Read and write was less preferred though valued better than just Visuals.

**Table 2: Learning preferences of the students through the strength of learning modes**

Strength of learning modes	Frequency	Percent
Unimodal	183	36.8
Bi-Modal	70	14.0
Valid Tri-Modal	78	15.4
Quada modal	169	33.8
Total	500	100.0

**3. Association between age and learning modes adopted by the students:** With a view to understand whether age has role any in influencing the learning modes of the students chi square and ANOVA were used .Table 3 depicts the crosstab regarding the age and the VARK mode adopted by the students in this study. The outputs show that 183 students who fall in the category of 20-22years, 23-25years and 26-28years turned out Unimodal and next in order was the group of 169 students who were in all these three age groups were Quadri modal as per the application of VARK. With a view to finding out the association between the VARK mode and age of the students Chi square test was used and the output is shown in the table 4.

**Table 3: Age and VARK Mode Crosstabulation**

	Age	VARK Mode				Total
		Unimodal	Bi-Modal	Tri-Modal	Quadri- modal	
	20-22Y	137	60	64	136	397
	23-25Y	43	9	13	31	96
	26-28Y	3	1	1	2	7
	Total	183	70	78	169	500

Table 4: Chi square test showing the association between the Age and the VARK mode adopted by the students

	Value	df	Asymp. Sig. (2-sided)	Monte Carlo Sig. (2-sided)			Monte Carlo Sig. (1-sided)		
				Sig.	99% Confidence Interval		Sig.	99% Confidence Interval	
					Lower Bound	Upper Bound		Lower Bound	Upper Bound
Pearson Chi-Square	6.411 <sup>a</sup>	6	.379	.377 <sup>b</sup>	.364	.389			
Likelihood Ratio	7.475	6	.279	.339 <sup>b</sup>	.327	.351			
Fisher's Exact Test	5.850			.399 <sup>b</sup>	.386	.412			
Linear-by-Linear Association	2.133 <sup>c</sup>	1	.144	.157 <sup>b</sup>	.148	.167	.080 <sup>b</sup>	.073	.087
N of Valid Cases	500								

a. 4 cells (33.3%) have expected count less than 5. The minimum expected count is .98.

Output from Table 4 shows that 4 cells (33.3%) have expected count less than 5, Fisher's Exact Test is applied.  $P=0.399 > 0.05$  and there is no significant association between the age and the VARK mode exhibited by the respondents. With a view to strengthen the study in the relevant area of finding the link between the age and the VARK mode adopted by the students ANOVA was applied and the outputs are depicted in Table 5.

Table 5: ANOVA showing the relationship between the age group of the students and their VARK mode

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.695	2	1.848	1.111	.330
Within Groups	826.583	497	1.663		
Total	830.278	499			

Out of the total of 500 respondents, 397 respondents belonged to the age group of 20-22years, 96 respondents belonged to 23-25 years and just 7 respondent students belonged to the age group of 26-28 years.

Output from Table 5 shows that F value is 1.111, df= 2 and the P value is 0.330 which is higher than the alpha ( $\alpha=0.05$ ) and thus the results are not significant. ANOVA also corroborates the fact that there is no relationship between the age of the students and the VARK mode adopted by the students. Thus age is not the determinant to influence the learning style of the students and the students opt for the learning styles as per their innate preferences. Post hoc test also states that there is no significant relationship between the three age groups, viz., 20-22years, 23-25years and 26-28years in opting for different learning modes.

**4. Correlation between the age and mean marks of three exams, viz., SSLC, PUC and University exam marks:** In order to understand the correlation between the age and the mean marks of three exams, viz., SSLC, PUC and Graduation, Pearson correlation test was applied and the out is shown in Table 6.

**Table 6: Correlation between the age and mean marks of three exams**

		Age	Mean marks of 3 exams
Age	Pearson Correlation	1	.106*
	Sig. (2-tailed)		.017
	N	500	500
Mean marks of 3 exams	Pearson Correlation	.106*	1
	Sig. (2-tailed)	.017	
	N	500	500

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

Interpretation: The test reveals that  $P=.017 < 0.05$  and Pearson  $r = .106$ ,  $\alpha=0.05$ , correlation results show that age of the respondent students has 0.106 correlation at the significant level of 5% with the mean marks of the three exams which means 10.6% correlation with each other and it states that there is a positive correlation between the age and mean marks of the students though it is considered to be weak. Since Pearson  $r = .106$  means that more the age level of the students more could be the level of marks scored by them. With a view to understand the extent of influence of independent variable (age) on the dependent variable (Mean marks of the three exams) regression analysis was used. The results are depicted in Table 7, 8 and 9 respectively.

**Table 7: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.106 <sup>a</sup>	.011	.009	6.79258

a. Predictors: (Constant), Age

**Table 8: ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	262.796	1	262.796	5.696	.017 <sup>b</sup>
	Residual	22977.297	498	46.139		
	Total	23240.093	499			

a. Dependent Variable: Mean marks of 3 exams

b. Predictors: (Constant), Age

**Table 9: Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	77.635	.883		87.883	.000
	Age	1.623	.680	.106	2.387	.017

a. Dependent Variable: Mean marks of 3 exams

Interpretation: The test states R squared is .011 which indicates that 1.1% of the level of mean marks of the three exams has been explained and adjusted r squared value is .009 which is close to r squared value .011. This level of predictability is low as mean marks of the three exams are affected by many other variables. This shows there is 1.1% (.011) variability of response data around its mean. The test shows that the equation  $Y=a+bx$  is interpreted as high mean marks score =77.635+1.623times of age of the respondent students which indicates that the mean marks of the three exams (constant) and age of student respondents (Incident variable). Hence we can interpret that the level of mean marks of the three exams is influenced by the age of the student respondents to the extent of (77.635+1.623times).

Since age is not the independent variable to influence the marks scored by the respondent students a correlation test was used to understand if the marks scored by the students in SSLC is in any way correlating with the marks scored by the students in PUC. The results are deicted in Table 10.

**Table 10: Correlation between SSLC and PUC marks**

	SSLC Marks	PUC Marks
SSLC Marks	Pearson Correlation	1
	Sig. (2-tailed)	.640**
	N	.000
PUC Marks	Pearson Correlation	500
	Sig. (2-tailed)	.640**
	N	.000

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

Interpretation: The test reveals that  $P=.000 < 0.05$  and Pearson  $r = .640$ ,  $\alpha=0.01$ , correlation results show that SSLC marks of the respondent students has 0.640 correlations at the significant level of 1% with the PUC marks of the student respondents which means 64.0% correlation with each other and it states that there is a positive correlation between the SSLC and PUC marks of the students. It cannot be considered as the weak correlation as the value 0.64 is near to the value of high positive correlation. Since Pearson  $r = .640$  means that more the marks scored by the students in SSLC more could be the level of marks scored by them in PUC as well. That means the scoring in the exam is irrespective of their learning mode and the VARK style. With a view to understand the extent of influence of independent variable (SSLC marks) on the dependent variable (PUC marks) regression analysis was used. The results are depicted in Table 11, 12 and 13 respectively.

**Table 11: Model Summary**

Model	R	R Square	Adjusted Square	Std. Error of the Estimate
1	.640 <sup>a</sup>	.410	.409	7.97721

a. Predictors: (Constant), SSLC Marks

**Table 12: ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21997.642	1	21997.642	345.680	.000 <sup>b</sup>
	Residual	31690.668	498	63.636		
	Total	53688.310	499			

a. Dependent Variable: PUC Marks

b. Predictors: (Constant), SSLC Marks

**Table 13: Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	20.714	3.339		6.203	.000
	SSLC Marks	.724	.039	.640	18.592	.000

a. Dependent Variable: PUC Marks

Interpretation: The test states R squared is .410 which indicates that 41.0% of the level of PUC marks of the respondents has been explained and adjusted r squared value is .409 which is close to r squared value .410. This level of predictability is low as PUC marks scored could be affected by many other variables. This shows there is 41.0 % (.410) variability of response data

around its mean. The test shows that the equation  $Y=a+bx$  is interpreted as high PUC marks score =20.714+.724 times of marks scored in SSLC by respondent students which indicates that the PUC marks of the students (constant) and SSLC marks of student respondents (Incident variable). Hence we can interpret that the level of PUC marks of the respondents is influenced by their SSLC to the extent of (77.635+1.623times).

**5. Relationship between the marks scored by PG and UG students in SSLC, PUC and University exams and their VARK mode:** With a view to understand if there is any relationship between the marks scored by PG and UG students in three important examinations viz., SSLC, PUC and University exams the Independent Samples T test was applied. The mean marks scored in three above said examinations are taken in to account. The output of T-test is shown in Table 14.

**Group Statistics**

	Unimodal OR Multimodal	N	Mean	Std. Deviation	Std. Error Mean
Mean marks of 3 exams	Uni modal	183	79.8372	5.60437	.41429
	Multimodal	317	79.4865	7.44376	.41808

**Table 14: Independent Samples T-Test showing the relationship between the marks scored and the VARK mode**

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Mean marks of 3 exams	19.228	.000	.553	498	.580	.35066	.63402	-.89502	1.59634
			.596	464.184	.552	.35066	.58858	-.80595	1.50727

The mean value of the Uni-modal respondents is on the higher side i.e.  $79.8372 \pm 5.60437$  compared with the mean value of multi modal respondents ( $79.4865 \pm 7.44376$ ). However, the

number of student respondents who have scored above 80 per cent average marks from the three previous examinations who were Uni-modal are only 113 out of 183 Uni-modal respondent students which is much lesser compared to 174 out of 317 multimodal respondent students who have scored above 80 per cent average marks. This shows that the students with multimodal learning style are high percentage scorers than the Uni-modal learning style. The T-test shows that  $t=0.553$ ,  $DF=498$ ,  $P=0.000$ ,  $\alpha=0.05$   $P=0.000 < 0.05$  which indicates there is a significance between the marks scored and the VARK mode adopted by the students.

**Conclusion:** No learning style is superior as it hardly plays a role in influencing the performance of the students. Since the learning in the preferred style only makes learning easier and more fun it will have a positive effect on performance of the students. There is no second thought that if learning is made pleasurable the performance in examinations will improve. Age is neither a barrier to learn nor a facilitator, but certainly gives maturity to the students to understand their innate learning styles. Understanding one's learning style makes the learning effective and meaningful. The combination of learning styles viz., Visual, Auditory, Read-write and Kinesthetic may be better from all practical perspective to make the learning a pleasurable exercise.

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