



EFFECTS OF CULTURE, GENDER AND STREAM ON LEARNING STYLES OF SCHOOL STUDENTS

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Abstract

The investigation was carried out with the objective to find out the effects of culture, gender and stream on learning styles of school students studying in Shimla and Dharamshala city of Himachal Pradesh. The survey was carried out among 555 senior secondary students of Indian and Tibetan culture. Sample was drawn by random cluster method. The tools for the collection of data were Kolb's learning styles inventory and Schmech's Inventory of learning processes. Three-way Analysis of Variance was used for the analysis of data. The study ascertained the difference in thinking, learning and decision making styles of Indian and Tibetan culture groups of senior secondary students and it was revealed that thinking, learning and decision making styles may follow specific cultures. The present research also led to the inferences that gender and stream were significant with reference to learning styles.

Keywords: Culture, Gender, Stream and Learning Styles



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Introduction

Tibetans, who came to India, belonged to border line areas in Tibet. Educational opportunities/facilities in these did not exist at all and therefore, they were mostly backward. Thousands of Tibetans led by H.H. Dalai Lama, sought refuge in India, 1959, the wake of the Chinese invasion of Tibet. The education of thousands of children was a subject of prime importance to His Holiness. H.H. The Dalai Lama has written in his autobiography titled "My Land My People", "The children have been a special anxiety to me- there are over five thousand, of them under the age of sixteen-we have to do something drastic to preserve their health and their education".

Education being high on the priority, the Dalai Lama requested the Government of India for assistance in the education of the Tibetan refugee children, since then many schools for Tibetan refugee children were built all over India and Nepal, while Tibetans were resetting in various settlements in different parts of Indian. Simultaneously, new monasteries and

nunneries were built as well for the new generation of monks and nuns to study and practice their religion. In this way, the Tibetans-in-exile kept their identity and preserved their religion and culture for the last forty-four years. According to the Webster's New World Dictionary a style is a distinctive or characteristic manner, or method of acting or performing. Styles represent a set of preferences. The style corresponds to a discrete notion of coherent singularity in a variety of contexts and has a wide appeal to human life.

Learning is a universal and essential human activity the world over. Learning styles are preferred ways of learning. These are stable and consistent characteristics of the learners. The different learning style models are based on different psychological theories. Models that are based on personality include Witkin (1954) and Myers-Briggs type indicator (Myers, 1978). In these models, it is assumed that basic personality-influences, the approach to acquiring and integrating information. A second type of model assumes that the method of information processing decides the individual's preferred intellectual approach to learning. Schemek's (1983) and Kolb's (1984) models are examples of the information processing approach. In the third style, the distinction is made on social interaction; Reichmann and Grasha (1974) are examples of such model. The fourth style considers multidimensional factors with in a human information processing frame work: examples are the Keefe (1989) and Dunn &Dunn (1978) models. All these models stress the importance of identifying and addressing individual differences in the learning process. Little research has been conducted to ascertain the relationship between culture and learning styles. Learning styles of students have been explored in relation to cultural backgrounds. Maximum researchers have been carried out by foreigners. In India till date no effort has been made by any researcher in this area as it is evident from the following studies.

Review Of Related Researches

Elfant (2002) found that there was no significant effect for student learning style for humanity based culture, but there was a significant effect for student learning style for the natural science and mathematics based courses. The learning styles for the natural science and mathematics based courses. The learning styles of Freshman was measured by Kolb's learning Style Inventory. Yahaya and Abdul Karm (2003) found that, if students' learning styles suit the course they are taking, it will be a positive effect towards their academic achievement. Clump and Skogsberg (2003) reported that all students of the university level scored significantly higher on deep processing and significantly low on methodical styles of learning than female's counterparts. Prakash (2006) reported that male prospective secondary teacher's preferred learning through abstract conceptualization and active experimentation,

whereas female prospective teachers preferred learning through concrete experience and reflective mode. Further it was found that female prospective teachers had greater preference for imaginative learning style, whereas male prospective teachers showed greater preference for precision learning style. On assimilation/analytical and accommodation/dynamic learning style gender differences were not found significant.

Yu-Rong 2007 conducted a study on learning style preference of Tibetan BPL learners in China on a sample of Tibetan National College. The major findings were (1) that the hands on, Independent reflective, Individuals oriented and serialist style were the most preferred once of Tibetan BPL learners which impulsive and auditory style were the list preferred (2) significant difference were found between male and female students in independent, individuals oriented visual learning style(3) Learning style preference varied significantly among students from different academic field in mainly modalities namely dependent, holist serialistic and random.

Rasimah&Zurina (2008) showed that students' academic achievement is influenced by their learning styles. Wang et al. (2008) showed that the learning style of each individual is different and these differences are seen as the factors or variables that influence student's academic achievement. Moshabab A. Asiry (2010) analyzed the learning styles at the level of first year students in Higher Education. The target population chosen is represented by the first-year history students at the University of Bucharest, and a group of MA students. The results seem to indicate uniformity in learning styles, but some significant differences are also visible. At the same time the implications for the academic History Curriculum are debated.

Need and Significance Of The Study:

Many style constructs have been proposed as important dimensions of individual differences in law. They approach cognitive tasks across situation. If all style constructs, cognitive styles have received the most extensive scientific inquiry. To list but a few major dimensions of cognitive style, the most popular examples of a few major dimensions of cognitive styles are field dependence-independence (Witkin& Good enough,1978); conceptual Tempo (Kagan, 1966); cognitive complexity- simplicity (Harvey, Hunt & Schroder,1961; Kelley,1995; Messick,1994).

Although focusing in different stylistic aspect of cognitive functioning. Cognitive style theorist's anomic, implicitly or explicitly. These styles are general modules and structural properties of cognitive systems, not merely personal preferences that are more or less under volitional control and therefore, changeable with conscious decision.

In contrast to cognitive style constructs, learning styles are proposed by more education-minded researchers who emphasize styles as personal performances based on sensory modality (visual, auditory, Barbe and Swassing, 1979), content features (concrete vs. abstract, Kolb, 1971); degree of structure in learning process, Hunt, 1975; physical and social characteristics of learning environment (Dunn, Dunon and Price, 1975).

Several researchers and writers have underlined the significance of styles of learning in terms of keys to understand student performance and classroom teaching. (Sternberg, 1990; Stone, 1976; Dunn et al. 1975). Sternberg (1994) categorically remarked that teacher must accommodate an array of styles (thinking and learning), by systematically varying teaching and assessment methods to reach every student. If they do it, they will observe immediate and powerful increases to student's performance. It is needless to mention that styles of learning will render a great help to all working in the field of education as students, teachers, guidance workers, counselors, curriculum designers as well as educational managers in the improvement and the betterment of total education process.

Delimitations of the Study:

The study was delimited with reference to objectives, hypotheses, variables, research method, tools, statistical technique, culture, stream, style, etc., which are elaborated as under: The investigation was delimited in terms of sample. The sample was comprised 555 senior secondary students of Indian and Tibetan culture. It was drawn by random cluster method.

1. The study was delimited in term of two cultural groups only (Indian and Tibetan). India has its own cultural Identity and similarly the Tibet is also known for his unique culture.
2. The study was further was delimited in terms of area. It was carried out in Shimla and Dharamshala city of Himachal Pradesh.
3. The study was delimited in terms of stream, only arts and science streams were taken in to consideration.
4. The study was delimited in terms of class also. The students of class +1 and +2(senior secondary) were selected.
5. The study was delimited with reference to dependent and independent variables. Dependent variables was 5 decision making styles. The independent variables were culture, stream and gender.
6. The study was delimited with regard to statistical technique i.e. Three-Way -ANOVA was used for the analysis of data.

7. The study was delimited with reference to factorial design. A 2x2x2 factorial design was used.
8. The study was confined to the research tools Kolb's Learning styles inventory, Schmech's Inventory of learning processes were used in the study.
10. The selection of the schools for sample was made by random method and it was confined to only four schools of Shimla and one school of Dharamshala.
11. The conclusions were confined to the delimitations of the study.

Research Method

In the present study, descriptive survey method of research was applied. According to Ary et al (1972) Descriptive research studies are designed to obtain information concerning the current status of phenomena. They are directed towards determining the nature of a situation as it exists at the time of study. There is no administration or control or treatment as is found in experimental research. Their aim is to describe what exists with respect to variables or conditions in a situation. It is most commonly used research method in educational research endeavor.

Population

According to Best and Kahn (1993) a population is any group of individuals that have one or more characteristics in common that are of interest to the researcher. The population may be all individuals of a particular type or a more restricted part of that group. Population of the present research comprised all senior secondary students studying in Tibetan and Indian schools located in Himachal Pradesh.

Sample

In the present study initial sample comprised 555 senior secondary students (Indian and Tibetan students). The subjects were drawn by cluster random method. 304 students were selected from three Indian Senior Secondary Schools and 251 Students from Two Tibetan Senior Secondary Schools. Out of 555 students 263 were Male students and 292 female students out of 555 students 316 students were science students and 229 were Arts students.

Tools Used :

In the present study Kolb's Learning styles inventory, Schmech's Inventory of learning processes were used. Kolb revised the learning style inventory by improving the format, simplifying the language, increasing Internal consistency, using a representative, normative sample, providing clearer instruction and simplifying scoring. (Smith and Kolb, 1986, P. 95) The new instrument (LSI-1985) now has 12 items instead of 9. And this instrument is used for measuring learning styles.

Statistical Techniques Used:

As the purpose of the study was to ascertain the main and interaction effects of culture, gender and stream on learning styles a three-way-analysis of variables technique was employed in the present study.

Main And Interaction Effects Of Culture, Gender And Stream On Learning Styles

The summary of Three-Way-ANOVAs in respect of divergent Learning Style has been given in Table 1.1 given below.

Table 1.1 2x2x2x ANOVA for Divergent Style

source variations	of SS	df	MS	F-Ratio	significance
Culture A	38.43214	1	38.43214	0.823513	NS
Gender B	1.889288	1	1.889285	0.042705	NS
Stream C	588.575	1	588.575	12.85208	**
A x B	381.8883	1	381.8893	8.632233	**
B x C	546.0038	1	548.0036	12.34188	**
A x C	73.03214	1	73.03214	1.65082	NS
A x B x C	153.0321	1	153.0321	3.459141	NS
Within	12033.28	272	44.23992		
Total	13794.11	279			

NS =Non Significant

*

=Significant at .05 level

**=Significant at .01 level

It may be seen in table 1.1 that F-ratio (.823), obtained for factor “A” was non-significant ($p > .05$, dfs 1 and 272). It means that culture had no significant influence on divergent leaning style of the students. In other words, Indian and Tibetan students were at par with reference to their preference for their divergent learning style.

It may also be seen in table 1.1 that effect of gender on divergent learning style was not significant ($F=.042$, $P < .05$,dfs = 1& 272). It implies that there was no gender difference in divergent learning style of the students that is both male and female students has similar results.

The F-ratio of 12.85 for the main effect of stream came out to be significant at 0.01 level of significance with df 1and 272. It means that students belonging to Science and Arts stream had difference in their preference for divergent learning style. Means of the two Streams indicate that the mean difference was in favour of arts stream ($M= 57.16 < M = 60.01$) from this it may be inferred that Arts students had greater preference for divergent learning style. Table 1.1 further states that F ratio of 8.63 for A x B interaction was found to be significant at .01 level of significance with degree of freedom 1 & 272. This indicates that cultural effect on divergent Learning style was moderated by gender. In other words the culture and gender

taken together exhibited significant influence on divergent learning style. In other words effect of culture (A) was dependent on gender (B) for divergent Learning Style.

It is evident from table 1.1 that B X C interaction came out to be significant ($F= 12.34, P < .01, df 1 \text{ and } 272$). This leads to the conclusion that gender and stream jointly influence the preference for divergent learning style.

Table 1.1 shows that A x C interaction was not found to be significant ($F=1.850, 13.05, df 1 \text{ \& } 272$). It implies that effect of culture was almost the same for students of science and arts for divergent learning style.

A x B x C interaction was also not found out significant ($F= 3.459, p >.05, df= 1 \text{ \& } 272$). From this, it may be inferred that A x B interaction was the same for two levels of “C”. (Science and arts) or B X C interaction was the same for two levels of “A” (Indian and Tibetan culture) or A x C interaction was the same for two levels of “B” (Male and female gender).

Assimilator Style

A summary of Three-Way-ANOVA in respect of Assimilator learning style has been given in table 1.2 that follows:-

Table1.2 2X2 X2 ANOVA for Assimilator Style

source of variation	SS	df	MS	F-Ratio	Significance
Culture A	2.05143	1	2.057143	0.04081	NS
Gender B	1.157143	1	1.157143	0.026331	NS
Stream C	176.0143	1	176.0143	4.005182	*
A x B	43.21428	1	43.21429	0.963335	NS
B x C	304.5143	1	304.5143	8.929182	**
A x C	182.4143	1	182.4143	4.150813	*
AxBxC	32.91429	1	32.91429	0.74896	NS
Within	119532.49	272	43.94664		
Total	12695.77	279			

NS = Not Significant at .05 level, * = Significant at .05 level

** = Significant at .01 level

It is evident from table 1.2 that F-ratio for main effect of A (culture) came out to be .048 which is not significant ($p >.05, df =1 \text{ \& } 272$). It leads to the conclusion that the preference for assimilator style was not influenced by the culture, students had similar preference for learning through assimilation style and it was not influenced by the culture. In other words, Indian and Tibetan students had similar preference for learning through assimilation style.

F-Ratio (.028) for factor “B” did not reach the level of significance ($p >.05$) with dfs 1 & 272. It suggests that gender had no significant effect on student’s preference for learning through Assimilator style.

Contrary to the above main effect of factor ‘C’ (Stream) on assimilator learning style was found to be significant at .05 level of significance. It means that students belonging to the science and arts stream differ significantly with regard to their preference for assimilator style. Means of the two streams groups indicate that science students had more preference for assimilator learning style than arts students’.

It may be seen in table 1.2 that A x B interaction was non- significant (F=.983, P >.05, dfs 1 & 272).It means that effect of gender on assimilator style was almost the same for the two levels of factor A (Indian and Tibetan) or vice versa.

Table 1.2 further shows that B x C interaction was significant (F=.8.292, P<.01 df 1 & 272).It conveys the meaning that effect of gender on assimilator style differs significantly for students of Science and Arts streams or Vice-Versa.

It may be noted from table 1.2 that interaction effect of A and C factor also came out to be Significant. (P<.05, df 1 and 272) As the F ratio (4.150) was found to be higher than that of table value of F. From this it may be concluded that the effect of Culture (A) was different for two levels of streams (Science and arts) so far as preference for assimilator learning style is concerned.

Table 1.2 further reveals the A x B x C Interaction was not significant (F=.748, p >.05,df 1 and 272). It points out that A x B interaction has the same mean for the level “C” (stream). In others words, there was no joint effect of culture, gender and stream on student’s assimilators learning style.

Table 1.3 provides the summary of Three Way ANOVA of Converger learning style.

Table 1.3 2x2x2 ANOVA for Converger style

Source of variance	SS	df	MS	F-Ratio	Significance
Culture A	21.175	1	21.175	0.528448	NS
Gender B	2.232143	1	2.232143	0.055706	NS
Stream C	726.4321	1	726.4321	18.129	**
A x B	381.8893	1	381.8893	9.530513	**
B x C	391.2893	1	391.2893	9.765102	**
A x C	71.00357	1	71.00357	1.771981	**
A x B x C	11.60357	1	11.60357	0.289581	NS
With in	10899.09	272	40.07017		NS
Total	12504.71	279			

NS = Not Significant at .05 level, * = Significant at .05 level

** = Significant at .01 level

It is clear from Table 1.3 that main effects of culture (A) and gender (B) were not found to be significant with dfs 1 and 272 as the respective F ratio =.528 and .0537 were of too small value. Hence it may be said that there was no significant difference between the Indian and

Tibetan, and male and female students with regards to their preference for converger learning style. F-ratio (18.129) for main effect of stream on converger learning style was highly significant ($p > .01$, df 1 and 272). It implies that students belonging to science and arts stream differed significantly for their preference for converger learning style. The mean difference being in favour of science stream conveys that students of science stream had stronger preference for converger learning style than students of arts stream.

Table 1.3 shows that f ratio (9.765) turned to be highly significant ($p < .01$, df 1 and 272). It means that culture (A) had deferential effect for male and female students with reference to converger learning style or it may be said that effect of culture was dependent upon gender (B) with regard to converger style . Or alternatively it may be stated that effect of gender was dependent on culture (A).

Interaction effect of B and C factors was highly significant ($F=9.765$, $P < .01$ df 1 & 272).From this it may be inferred that effect of gender (B) was different for two levels of stream (Science and Arts) with reference to converger learning style.

A x C interaction was non-significant even at .05 level of significance ($F=1.771$, $P > .05$ df 1 and 272). It implies that effect of gender was the same for two levels of stream (C) in science and arts or vice versa.

It may be seen in table 1.3 that combined effect of factors A,B and C as converger style of learning came out to be non- significant ($F= .289$, $P > .05$, dfs 1&272). Its means that A x B interaction was the same at two levels of C (stream) or A x C interaction did not differ for two levels B (male and female) or B x C interaction was almost the same for two levels of 'A'.

Accommodator style

Table 1.4 presents a summary of Three –Way- ANOVA in respect of Accommodator learning style.

Table 1.4 2x2x2 ANOVA for Accommodator style

Source of variation	SS	Df	MS	F-Ratio	Significance
Culture A	0	1	0	0	NS
Gender B	1.428671	1	3.426575	0.0032608	NS
Stream C	103.2143	1	103.2145	2.362303	NS
A x B	43.21429	1	43.21429	0.989061	NS
B x C	182.2286	1	182.2266	4.399605	*
A x C	185.8571	1	185.8571	4.249203	*
A x B x C	10.41429	1	10.41429	0.238358	NS
With in	11884.29	272	43.68223		
Total	12420.44	279			

NS = Not Significant at .05 level, * = Significant at .05 leve

** = Significant at .01 level

Table 1.4 shows F-ratio (0.035, 2.362 for the main effects of culture, gender and stream came out to be non significant ($p > .5$, df 1 and 272). It means students preference for learning through Accommodator style was not influenced by the any of independent factors like culture, gender and stream. In other words, students belonging to Indian and Tibetan culture, male and female gender and science and arts stream were having more or less same magnitude of preference for learning style through Accommodator style.

Table 1.4 further shows that A x B interaction was found out to be non-significant at .05 level ($F=.989$, $P > .05$ df 1 & 272) .It implies that effect of culture for male and female students was not different with preference to accommodate learning style.

It is evident from table 1.4 that F- ratio (4.249) representing the interaction effect of B x C was found to be significant at .05 level with df 1 & 272.It means that effect of gender on accommodate style of learning was different for students of science and arts streams.

It may be observed in table 1.4 that A x B x C interaction was not significant ($F=0.238$; $p > .05$; df 1&272). From this it may be inferred that A x B interaction for two levels of (C_1 & C_2) or B x C interaction at two levels of A(A_1 and A_2) or A x B interaction at two level of C (C_1 and C_2) was significant. In other words A,B and C factors (culture, gender and stream could not influence students preference for learning through Accommodator learning style.

Table 1.4 further shows that A x C interaction was significant for Accommodator style.($F=4.249$, $P < .05$, df 1 and 272) it implies that effect of culture (A) was different for two levels of stream (B)i.e. B(science) and B(Arts).

A summary of Three –Way ANOVA of Surface Processing Style has been presented in table 1.5 that is given as under:-

Table 1.5 2X2X2 ANOVA for Surface Processing Style

Source of variation	SS	df	MS	F-Ratio	SIGNIFICANCE
Culture A	386.575	1	386.575	15.19398	**
Gender B	0.175	1	0.175	0.006878	NS
Stream C	39.375	1	39.375	1.547598	NS
A x B	111.8893	1	111.8893	4.397706	*
B x C	9.289286	1	9.289286	0.365107	NS
A x C	386.575	1	386.575	15.19398	**
AxBxC	45.68929	1	45.68929	1.795775	NS
With in	6920.4	272	25.44265		
Total	7899.968	279			

NS = Not Significant at .05 level,

* = Significant at .05 level

** = Significant at .01 level

Table 1.5 discloses “ A “ effect on Surface processing style was found to be highly significant as F-ratio of 15.193 with dfs 1 and 272 turned out to be greater than the table value of F. This implies that culture had significant influences on surface processing style of the students. Mean difference of two culture groups indicate that Tibetan students were found to have stronger preference for surface processing style than Indian students ($M=16.5 < M=18.86$).

Table 1.5 reveals that F-ratio depicting the effects of gender came out to be .006 which is less than the required F value at 0.05 levels with dfs 1 and 272. It leads to the conclusion that there was no significant difference in preference for surface processing style of male and female students.

In main effect of stream (C) was also non-significant ($F= 1.547 > .05$, df 1 and 272). It points out that the students of science and arts Streams had similar level of surface processing style. Table 1.5 shows that A x B interaction effect is significant at .05 level ($F=4.397$). In this it may be inferred that the combined effect of culture and gender was significant on surface processing style.

It further conveys that effect of culture was dependent on gender (B) for surface processing style of students.

B x C interaction being non-significant at .05 level ($F=.385$) revealed that the joint effect of gender and stream did not emerge as significant levels at .05 level of significance. Hence it may be inferred that gender and stream jointly could not influence preference for learning through surface processing. Further it may be concluded that stream effect was the same for both male and female students with reference to surface processing learning style.

Table 1.5 also shows that A x C interaction was found to be highly significant ($F=15.193$, $P < .01$, df 1 and 272). This leads to the conclusion that effect of culture significantly varied for two levels of streams.

Table 1.5 discloses that A x B x C interaction with regard to preference for the surface processing style was not significant ($F=1.795$, $P < .05$, dfs 1 and 272). It implies that A x B interaction did not differ significantly at the two levels of C (C_1 and C_2) i.e. (science and arts)

Disorganized study methods

Table 1.6 provides summary of Three-Ways-ANOVA in respect of disorganized study method

Table 1.6 2x2x2 ANOVA for Disorganized study method

Source of variation	BS	df	MS	F-Ratio	significance
Culture A	929.2893	1	929.2893	30.92483	**
Gender B	10.03214	1	10.03214	0.35292	NS
Stream C	204.0036	1	204.0036	6.818167	**
AxB	94.88929	1	94.88929	3.171371	NS
B x C	48.88929	1	48.88929	1.633968	NS
A x C	368.0036	1	368.0036	12.29934	**
A x BxC	4.889286	1	4.889286	0.163409	NS
Within	8138.4	272	29.92059		
Total	9794.396	279			

NS = Not Significant at .05 level,

* = Significant at .05 level

** = Significant at .01 level

Table 1.6 shows that F-ratio (30.924) representing the effect of factor “A “was found to be highly significant ($P < .01$, df 1 and 272). From this it may be inferred that effect of culture on preference for disorganized study habits was beyond the chance factor, further it was in favour of Tibetan students. Therefore, it may be said that Tibetan students have stronger inclination towards study habits than their counter part Indian students.($M=14.03 < M=17.66$)

Table 1.6 reveals that main effect of gender was non- significant ($f = .335$, $p > .05$, df 1 and 272.) it suggests that male and female students were at par with regard to disorganized study habit methods.

Table 1.6 points out that main effect of stream was highly significant ($F = 6.81$, $p < .0.1$, df 1 and 272). From this it may be concluded that students of science and arts stream have significant difference with regard to use of disorganized methods.

Since mean difference in Disorganized study method was in favour of science stream ($M=16.7 > M=14.99$)

It is evident from table 1.6 that A x B and interaction A x C interaction were non-significant as their f ratio (3.171, 1.633) came out to be less than the table value of df 1 and 272. It means joint effect of A x B culture and gender and B x C (gender and stream) were not statistically significant with reference to disorganized study habits of students. Meaning thereby a effect was independent of ‘B’ and ‘B’ effect was independent of factor ‘C’.

However A x C interaction was highly significant ($F=12.299$, $P < .05$, df 1 and 272.) .It means effect of culture and stream effect varies significantly for two levels of stream (science and arts).

Table 1.6 further discloses that A x B x C interaction was not significant as the obtained F value (.165) was quite small hence it may be deduced that A x B interaction was the same as the levels of science and arts.

Fact Retention Style.

Table 1.7 presents a summary of Three –Way- ANOVA in respect of Fact Retention style.

Table:-1.7 2x2x2 ANOVA for Fact Retention Style

Source of variation	SS	df	MS	F-Ratio	significance
Culture A	4.375	1	4.375	0.340895	NS
Gender B	94.88929	1	94.88929	7.379331	**
Stream C	54.03214	1	54.03214	4.207655	*
AxB	9.289288	1	9.289288	0.723388	NS
B x C	0.003571	1	0.003571	0.000278	NS
A x C	94.88929	1	9.488929	7.389331	**
Ax B x C	28.575	1	29.575	2.3031	NS
Within	3492.857	272	12.84339		
Total	3779.911	279			

NS = Not Significant at .05 level,

* = Significant at .05 level

** = Significant at .01 level

It may be seen in table 1.7 that culture had no statistically significant effect in Fact Retention Style of learning as ratio (.340) was less than the required. In other words Indian and Tibetan students had almost similar tendency of Fact Retention Style.

Table 1.7 shows that F-ratio (7.389) represents main effect of gender came out to be significant at .01 level of significance with dfs 1 & 272. It means that Fact Retention Style was strongly influenced by the gender of the students. Alternatively, it may be said that male and female students had difference in their preference for learning through Fact Retention Style. Mean value of the two gender indicate that female students had inclination towards the use of fact retention style than male students (M=15.65 < M=16.81).

F-ratio (4.207) came out to be significant (P < 05, dfs 1 and 272). It indicates that there was significant difference in preference for Fact Retention Style of students belonging to science and arts stream.

Means of the two streams (M= 16.67 > M= 15. 79) revealed that mean difference was in favor of science group. Hence it may be said that students belonging to science stream had stronger preference for fact retention style than the students of arts stream.

A x B and B x C interactions were not found to be significant even at .05 level of confidence (F= .723, F=.002, df = 1 and 272). It leads to the inference that effect of (A)was not significantly different for two levels of Gender (B). Also the effect of Gender (B) was almost

same for two levels of stream (C). However the effect of culture (A) was significantly different from two levels of stream (C). ($F= 7.389$, $df =1\&272$, $P < .1$) Hence there was significant interaction between A & C factors with regard to Fact Retention Style.

Table 1.7 shows that F ratio (2.303) was non- significant ($p > .05$), $df 1\&272$). It means A x B x C Interaction was not significant with reference to students Facts Retention Style.

Elaborative Style

Table 1.8 provides a summary of Three-Ways-ANOVA in respect of Elaborative style

Table 1.8 2X2X2 ANOVA for Elaborative Processing Style

Source of variance	SS	df	MS	F-Ratio	Significance
Culture A	89.91429	1	88.91429	5.99626	*
Gender B	183.2266	1	182.2286	13.26194	**
Stream c	0.057143	1	0.057143	0.003942	NS
A x B	88.15714	1	89.15714	8.15099	*
B x C	37.15714	1	37.15714	2.58349	NS
A x C	0.128571	1	0.128571	0.00887	NS
A x B x C	8.22857	1	8.22857	0.567683	NS
WITH IN	3842.571	272	14.49475		
TOTAL	4358.443	279			

NS = Not Significant at .05 level, **= Significant at .01 level

* = Significant at .05 level

Table 1.8 exhibits that the F-ratio (5.996) was significant ($P < .05$, $df 1\&272$). It suggests that student's preference for elaborative style was significantly influenced by culture. Mean values point out that Indian students were more inclined towards elaborative style than Tibetan students ($M= 24.89 > M =23.78$)

It may be seen in table 1.8 that effect of gender was highly significant on elaborative style of students. ($F= 13.26$, $p < .01$, $df1\&272$). Further, means of the two samples reveal that the Tibetan students had more preference for elaborative style more than counterpart Indian students. ($M= 23.51 < M= 25.86$).

Main effect of stream turns out to be non-significant ($F=.003$, $P > .05$ $df 1 \& 272$). It implies that students of science and arts stream had similar magnitude of preference for elaborate Style of learning.

A x B interaction was found to be significant at .05 level of significance ($F=6.150$, $df=1 \& 272$). For this, it may be said that effect of culture (A) was significantly different for male (B_1) and female (B_2).

Table 1.8 further shows that BC and AC interaction did not emerge significant even at .05 level of significance with reference to elaborative style. It means that effect of gender and culture respectively was the same for two levels of the stream i.e. science and arts.

Three factors interaction (A x B x C) was also non-significant. With respect to elaborative Style of learning ($F=.567, P > .05, df 1\&272$). It implies that A x B interaction was the same for two levels of C (stream). In other words culture and gender's joint effect was similar for elaborative style of science and arts stream.

Discussion of the Results

Tibetan students were found higher on Surface proceeding and disorganized study methods while Indian students on elaborate processing. Due to lack of similar studies the results of the study did not receive empirical support or contradiction. However, there are studies which have reported impact of culture on different learning style. For example, **Wang (1995)** reported that there were significant differences between Chinese and American Graduates' students which reference to learning styles.

Goodson (1993) found that Chinese, Korean and Taiwan's students preferred visual, auditory, kinesthetic/factual and individual learning styles while Japanese students as group differs from Chinese, Korean and Taiwanese students. **Lapoint (1990)** reported that Indian students were found more competitive than whites and Asian and Indian students had similarity in competitiveness and collaborative style.

Gender has significant effect on some learning styles of senior secondary students. learning styles of females were found to be higher on these two learning styles namely Fact Retention and Elaborate processing style and in other six learning styles under study viz Diverger, Assimilator, Converger and Accomodator styles of male and female students no significant difference was noticed. These findings were in contradiction of studies by **Joerger 1992** reported that male students were more Assimilator in their learning style than female students. **Bishop (1985)** also found opposed results. In his study, female students were higher on Accommodator style.

Stream has significant effect on some learning styles of senior secondary students. This hypothesis was confirmed in the light of the finding of the studies. The stream had marked effect on Diverger, Assimilator, Converge and Disorganized study methods and Fact Retention style. Science students more preferred Assimilator, converger, and disorganized study method and Facts Retention and arts students showed stronger inclination for diverger style than their counterparts students. The finding seems to be logical in view of nature of science and arts.

Significant interaction between culture and gender (A x B) on some learning styles of senior secondary students. The finding revealed that A x B interaction was significant for Diverger, Converger, Surface processing and elaborate processing styles.

In the present study B x C (Gender and Stream) interaction turned out to be significant for Diverger, Assimilator, Converger and Accommodator styles.

In the present research interaction between culture and stream (AxC) was found to be significant in case of Assimilator, Accommodator, Surface processing, and Disorganized studies methods and Fact Retention style.

A x B x C interaction effect was accepted as no significant interaction between culture, gender and stream emerged in the present study.

Implications for Education:

The study ascertained the difference in thinking, learning and decision making styles of Indian and Tibetan culture groups of senior secondary students and it was revealed that thinking, learning and decision making styles may follow specific cultures. Hence, this bears the implication that our ability to give every student a chance to succeed depends upon a full understanding of culture and different type of thinking, learning and decision making styles. After all effective educational planning and practices must emanate from and understanding of the ways an individual thinks, learns and take decision. Consequently, knowing each student, especially his culture, is essential, preparation for facilitating structuring, and validating successful learning for all students (Pat Guild, 1994). It is also recommended that educators should acquire more explicit knowledge about particular cultural values and expectation because such knowledge would enable educators to be more sensitive and effective with students of particular culture. Proponents of thinking, learning and decision making styles advocate that teaching-learning and evaluation process should be based on culture specific style, in order to yield best results in the classroom. However, some authors were against this practice.

For instance Hillgard (1989) thinks that, "I remained unconvinced that the explanation for low performance of culturally different "minority groups" students will be found by pursuing questions of behavioral styles..... Children, no matter what their style, are failing primarily because of systematic inequities in the delivery of whatever pedagogical approach the teacher claim to master – not because students cannot learn from teachers whose styles do not match their own." He further says that, "Educator need not to avoid addressing the question of style for fear they may be quietly of stereotyping students. Empirical observations are not the

same as stereotyping but the observations must be empirical and must be interpreted properly for each student.”

The present research also led to the inferences that gender and stream were significant with reference to learning styles. These findings have the implications that variations in learning styles due to gender and stream/ faculties/subjects should be given due consideration in teaching. Educators should match teaching styles and techniques with those styles differences. Simultaneously he should use and accommodate various learning styles in his teaching to benefit all students. However, no educational implication may be suggested based on two factor and three factor interactions related findings.

Broadly speaking variation in culture, learning styles should find an important place in school education to make it more meaningful and more effective.

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