

**THINKING STYLES OF SCHOOL STUDENTS AS RELATED TO CULTURE,  
GENDER AND STREAM****Jeet Singh Rana, Ph. D.***Research Scholar, Department of Education Himachal Pradesh University Summerhill,  
Shimla***Abstract**

*The present study is designed to study the effects of culture, gender and stream on thinking styles of school students. The sample was drawn by cluster random method of sampling by which 304 students were selected from three Indian Senior Secondary Schools and 251 Students from Two Tibetan Senior Secondary Schools students studying in Shimla and Dharamshala city of Himachal Pradesh. As the purpose of the study was to ascertain the main and interaction effects of culture, gender and stream on thinking styles of students, a Three-way Analysis of Variance technique was employed. Indian students showed greater preference for Legislative, Executive, Local Liberal, Conservative, Hierarchic, Monarchic and Internal style than their counterparts whereas Tibetan students were higher than Indian in the use of Oligarchic style indicating the main effect of culture. Female students had significantly stronger preference than Male students for Legislative, Executive, Judicial, Global, Local, Liberal, Hierarchic, Monarchic, Oligarchic, and Anarchic thinking styles.*

**Keywords:** *Culture, Gender, Stream and Thinking Styles*

**Introduction**

India is a secular country where the people of different culture, religion, caste and community live together with peace and harmony without any fear. To respect the culture and feelings of other is the rich cultural heritage of India. The people of different countries live here with all freedom in respect to their education and living. Education is a prerequisite for cultural and socio-economic development, for all the sections that are living in a country. There are some sections of the community as refugee who have all along been subjected to various kinds of deprivation and discrimination and therefore, stand in need of instant development. Education is a right and all citizens of the country should have access to it. The Tibetan refugee account for a very small percentage of the Indian population. It is through education that they can fully utilize the opportunities for socio-economic development. Education is also an instrument of liberation and endows the deprived groups with confidence, courage and ability to resist exploitation. Article 46 of the Indian constitution specially stated that “**The state shall promote with special care the**

**educational and economic interests of the weaker sections of the people and in particular of the scheduled castes and the scheduled tribes and shall protect them from social injustice and all forms of exploitation”**. But there is no such provision as such for Education of Refugees living in India like Tibetan. Tibetans are living in India since 1959 like refugees and thus are facing various problems of their adaption to a new physical and socio cultural environment in India.

Tibet, the country so isolated, lies in the heart of central Asia buttressed by higher mountain, so irresponsive, so lofty to outside influences has held herself so far apart from the madding interferences of the busy commercial world. It lies between 28<sup>th</sup> and 36<sup>th</sup> parallels of the world latitude and 79<sup>th</sup> and 99<sup>th</sup> of east longitude. Tibet lies on the west of China, North of India and Nepal, East of Persia and South of Russia and Mongolia. The southern border of Tibet has three main provinces known as U-Tang, Dotod and Domed, China Britain and Russia expanded their empires edging ever closed to Tibet's ill guarded frontiers. Chinese made their presence felt since the beginning of 18<sup>th</sup> century. In 1950, the people liberation army of communist China invaded – a Himalayan kingdom so deeply committed to Buddhism that its kings are named as Avalokitesvara. Before the Chinese put an end to the fighting his holiness, the XIVth Dalai Lama, Gyalwa Tenzin Gyatso fled to India with a large chunk of his people.

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.

Thinking styles are the individual's preferred ways of using abilities. These are in fact related to cognition, which includes perceiving, sensing, problem solving, thinking and remembering. However, thinking styles are different from cognitive styles in the sense that these are more general and instead of one they have many dimensions. For instance, filed dependence/independence, impulsivity/reflectivity etc. cognitive styles have only one dimension whereas Sternberg's thinking styles based on multi dimensions such as functions, forms, levels, scope and learning. These thinking styles are thinking intellectually or creatively.

The objective of mental self-government theory is to integrate various approaches to style and to provide new directions for theory applied to educational practice.

According to Sternberg (1988, 1994) the basic idea of this theory is that the people like societies, and they have to organize as government themselves. Thus the theory answers the

question of how people govern and manage their every day cognitive activities within the school and outside the school, in mental self-government a style of thinking is defined as a preferred way of thinking. It is not ability but rather a favored way of expressing or using one or more abilities. Two or more people with some levels of abilities might nevertheless have very different styles of thinking. Whereas two peoples with similar personality characteristics might differ in their thinking styles. Thus according to this theory the, styles of thinking do not reside in the domain of ability or in the domain of personality but in the interface between the two. Sternberg has identified thirteen thinking styles based on functions, forms, levels, scope and learning.

Some researchers have reported that different cultures and different educational systems influence student's ways of processing information. In this section the review of such studies has been presented.

### **Review of Related Researches**

There are some studies on culture and styles of thinking which are as follows:

Raj Kumar (2006) in his study found that culture had significant effect on cognitive style of senior secondary students; non tribal students were found to be higher than tribal students on filled independence cognitive style.

Zhang, Postiglione and Gino(2012) Explored thinking style of Tibetan Minority University students vis-han Chinese Majority students. Participants were 408 Tibetan students and 920 Han Chinese's students. Result of the study indicated that compared with Han Chinese's students, Tibetan students scored significantly higher on the more norm conforming thinking style but significantly lower on the creativity generation style more over the Tibetan students indicated strong preference for working with other as opposed with other independently.

Some studies have been conducted on gender differences in styles of thinking. For instance: Siqueira and Wechsler(2004) reported that among high school students female students preferred to be more intuitive and emotional their male colleagues.

Rajkumar(2006) reported that male students were higher on filled independent cognitive style than female senior secondary students.

Mundim and Wechsler (2007) when comparing business people, they observed women have a style demonstrating more emotional sensibility than men.

Yildizlar (2011) designed a study to compare teacher candidate thinking styles according to some demographical factors the participants of the study were 212 teacher candidate (118 females, 94 males) were enrolled at international Cyprus university in North

Cyprus Turkish republic. Sternberg and Wagner's thinking style inventory was used for data collections. According to data analysis, Scores showed meaningful differences according to gender in legislative style sub questions in favours of males. Meaningful difference was not found in other 12 thinking styles.

Several investigations made attempt to examine differences in thinking style for students of different academic majors and subjects. Some studies have been revised in the following paragraphs.

Sagone and Caroli(2012)studied the relationship of creativity and thinking style in Arts, Science and Humanities high school students. Thinking style inventory of Stenrberg and Wagner was used for data collection. Results showed the more sciences students preferred to work with concrete problems and details the more transformed Idea from one to another different mental sets ; The more science students preferred to go beyond exciting rule and maximize changes, the more they were able to change the ideas in different mental set, the more science students preferred to maximize changes the more they were able to process uncommon and meaningful idea, in addition, the more science students preferred to work with other people and to follow existing rule and minimize changes the less they were able to enrich and elaborate their Ideas in different ways.

Sood,(2014) conducted a study on relationship of thinking style to creativity and academic streams . The sample comprises 345 students of senior secondary school. Thinking style Inventory( Hindi adaptation by B.P Verma was used for the data collection along with a test of verbal creativity of results of the study revealed that stream had significance effect on Monarchic and external Thinking styles , arts students tended to rate them higher on Monarchic thinking style than science students

### **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.

Thinking form the part of cognition like intelligence. Hence, in the present research work, styles of thinking have been treated under cognition.

Several researchers and writers have underlined the significance of styles of thinking 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 thinking 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 Dharamsala 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 class10 +1 and 10+2( senior secondary) were selected.
5. The study was delimited with reference to dependent and independent variables. Dependent variables were 13 thinking 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 also Sternberg and Wegner's Thinking styles inventory was used in the study.
9. 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.
10. 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.

### **Tool used:**

In the present study the Hindi version of 65 – items TSI was prepared by B.P. Verma and Kamal Prakash and was shown to the teacher of education knowing Hindi English well for checking language accuracy as well as content of the statement. On the basis of unanimous agreements statements were retained if in some statements some revision was needed it was done by the Investigator. It may be mentioned here that in the beginning of TSI instead of 7 point Likert scale, 5 point Likert scale was used.

An attempt was to determine its concurrent validity by administering English and Hindi version on the same sample, drawn randomly from two institutes of B.Ed . the sample comprised of 50 subjects. Before administrations of the inventory necessary instructions were given to the subjects and they were told to give their response using 5. Scale with objectivity. 10 minutes interval was also given between the administration of two versions of TSI ( i.e.; Hindi and English ) on the completion of both the tools scoring was done with the help of standard key.

Test-retest reliability was also established for the Hindi version of TSI with the interval of 2 weeks. In view of the concurrent validity and test-retest validity of Hindi adapted version of TSI was treated appropriate to use with the indented sample of the study.

**Statistical Techniques Used**

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

**Analysis of Data**

Thirteen thinking styles have been included in this section. Main and interaction effects of culture, gender and stream have been analyzed in context of each of the thirteen thinking styles.

Summary of Three-Way-ANOVA with respect to legislative style has been presented in Table 1.1 given below:-

**Table 1.1 2x2x2 ANOVA for LegislativeStyle.**

Source of Variation	SS	df	MS	F-Ratio	Significance
<b>Culture A</b>	377.2321	1	377.2321	38.76147	**
<b>Gender B</b>	104.4321	1	104.4321	10.73084	**
<b>Stream C</b>	127.575	1	127.575	13.10862	**
<b>A x B</b>	1.575	1	1.575	0.161835	NS
<b>B x C</b>	0.289286	1	0.289286	0.029725	NS
<b>A x C</b>	9.289286	1	9.289286	0.954495	NS
<b>A x B x C</b>	4.889286	1	4.889286	0.502385	NS
<b>Within</b>	2647.143	272	9.732143		
<b>Total</b>	3272.425	279			

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

\* = Significant at .05 level,

It may be seen in Table 1.1 that F-ratio (38.76) representing main effect for factor ‘A’ (Culture) was found to be significant at .01 level. Alternatively it may be said that students belonging to Indian and Tibetan cultures differed significantly with regard to legislative thinking style. Since mean difference was in favour of Indian students (M=20.59

> M=18.26), it may be said that students hailing from Indian culture had more liking for the use of legislative style as compared to students belonging to Tibetan culture.

Table 1.1 further shows that sex of the students had significant effect on legislative thinking style (F=10.73, P < .01,dfs =1 and 272), it implies that there was significant difference between male and female students for their preference for the use of legislative style. Female students had significantly greater magnitude of preference for legislative style than male students (M=18.81 < M=20.4).

It may also be observed from Table 1.1 that F- ratio (13.108) turned out to be highly significant. (P < .01,dfs 1 and 272). This suggests that stream also had significant effect on legislative style. Students belonging to arts stream exhibited more preference for this style than students belonging to Science stream (M=18.75 < M=20.1)

Table 1.1 further discloses that all the interaction effects (A x B, B x C, A x C and A x B x C) came out to be non-significant at .05 level of significance with dfs 1 and 272 with reference to legislative thinking style. From this, it may be inferred that effect of A (Culture) was not dependent on factor B (Gender), effect of gender (B) was not dependent on factor 'C'(stream), effect of factor 'A' was not dependent on factor C (Stream), and A x B interaction effect was not dependent on factor 'C' stream with regard to legislative style.

A summary of Three-Way-ANOVA with regard to executive style has been given in Table 1.2

**Table 1.2 2x2x2 ANOVA for Executive Style**

Source of Variation	SS	df	MS	F-Ratio	Significance
<b>Culture A</b>	40.1285	1	40.1285	4.5194	*
<b>Gender B</b>	84.7	1	84.7	9.5393	**
<b>Stream C</b>	14.6285	1	14.6285	1.6475	NS
<b>AxB</b>	2.4142	1	2.4142	0.2719	NS
<b>BxC</b>	38.6285	1	38.6285	4.3505	*
<b>AxC</b>	0.2285	1	0.2285	0.0257	NS
<b>AxBxC</b>	20.6285	1	20.6285	2.3233	NS
<b>Within</b>	2415.086	272	8.8789		
<b>Total</b>	2616.443	279			

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

\*\* = Significant at .01 level

It may be observed in Table 1.2 that F- ratio (4.519) was significant (P < .05, dfs 1 and 272). It leads to the conclusion that executive thinking style of students was significantly influenced by the culture variation. Mean score of Indian students was found to be greater than Tibetan students (M=20.11 > M=19.36). It indicates that Indian culture was more prone to use executive thinking style than Tibetan culture.



Table 1.2 shows that main effect of gender (B) was also significant ( $F=9.539$ ,  $P < .01$ , dfs 1 and 272). It means that male and female students had marked difference in the preference for executive thinking style. As mean difference resulted in favour of female group ( $M=19.19 < M=20.29$ ). It may be stated that female students were more inclined to use executive thinking style in comparison to male students.

Table 1.2 reveals that F-ratio (1.647) was less than the required F value of the Table at .05 level with dfs 1 and 272. It corresponds to the main effect of factor 'C' (Stream). Hence it may be said that stream had no significant effect for executive thinking style. In other words, students belonging to both streams- science and arts had similar preference for the use of executive style.

Table 1.2 exhibits that A x B interaction effect was non-significant ( $F=272$ ,  $P > .05$ , dfs 1 and 272). It simply conveys that effect of 'A' factor (Culture) did not vary for the two levels of factor 'B' (Gender) with reference to executive style.

Table 1.2 reveals that F-ratio of 4.35 representing interaction effect of B x C (Stream) was significant at .05 level of confidence. It leads to the inference that joint effect of sex and stream on executive thinking style was beyond chance factor. In other words, effect of sex was dependent on stream.

Table 1.2 indicates that F-ratios (0.25 and 2.32) were non- significant. From this, it may be said that effect of culture (A) was independent of stream (C). Also A x B interaction effect was independent of factor 'C' Thus A x C interaction and A x B x C interaction did not exist with reference to executive style of students.

Table 1.3 provides the summary of Three Way-Analysis of variance with reference to judicial thinking style.

**Table 1.3 2 x 2 x 2 ANOVA for Judicial style.**

Source of Variation	SS	df	MS	F-Ratio	Significance
Culture A	135.6035	1	135.6035	14.2616	**
Gender B	81.4321	1	81.4321	8.5517	**
Stream C	1.575	1	1.575	0.1654	NS
AxB	17.0035	1	17.0035	1.7856	NS
BxC	6.0035	1	6.0035	0.6304	NS
AxC	65.0892	1	65.0892	6.8354	**
AxBxC	6.603570	1	6.6035	0.6934	NS
Within	2590.057	272	9.5222		
Total	2903.568	279			

It may be seen in Table 1.3 that  $F=14.261$  were significant at .01 level with dfs 1 and 272. It implies that culture had main effect on judicial style. This means that students belonging to Indian and Tibetan cultures differed significantly with reference to use of Judicial thinking

style. Indian students had greater mean score than Tibetan students ( $M=18.99 > M=17.59$ ), meaning thereby, Indian students had more inclination towards use of Judicial thinking style than their counterpart Tibetan students.

Table 1.3 reveals that main effect of sex on Judicial thinking style was highly significant ( $F=8.551, P < .01, dfs 1$  and  $272$  mean score of female students was found greater than male students ( $M=17.75 < M=18.83$ ). This indicated that female students superseded their counterpart male students in the use of Judicial thinking style.

Table 1.3 shows that main effect of stream for Judicial thinking style was found to be non-significant. ( $P > .05$ ). It means that there was no difference in use of judicial style of students of Science and Arts streams. Both the groups had almost similar tendency to use judicial style.

Table 1.3 further reveals that  $A \times B$  and  $B \times C$  interaction effects were not statistically significant ( $P > .05, df 1$  and  $272$ ). It leads to the conclusion that combined effect of culture and gender and gender and stream on Judicial thinking style was not significant beyond chance factor. Table 4.3 further shows that  $A \times C$  interaction was significant ( $F=6.835, P < .07, dfs 1$  and  $272$ ). From this it may be inferred that effect of A (Culture) was not similar for the two levels of stream (Science and Arts) or vice versa with reference to judicial thinking style.

It may be observed that three factors ( $A \times B \times C$ ) interaction effect was also non-significant ( $F=0.693, P > .05, dfs 1$  and  $272$ ). It implies that  $A \times B$  interaction effect was almost the same for two level of factor 'C' (stream) or it may be said that  $B \times C$  (gender  $\times$  stream) interaction was the same at the level of factor 'A' (Culture) or  $A \times C$  interaction was similar for the two levels of factor 'B' (Gender) with reference to Judicial thinking style.

Table 1.4 presents summary of Three-Way-ANOVA with reference to global thinking style

**Table 1.4 2x2x2 ANOVA For Global Style.**

Source of Variation	SS	df	MS	F-Ratio	Significance
<b>Culture A</b>	1.1571	1	1.1571	0.1291	NS
<b>Gender B</b>	64.1285	1	64.1285	7.1559	**
<b>Stream C</b>	98.4142	1	98.4142	10.9818	**
<b>AxB</b>	3.6571	1	3.6571	0.4080	NS
<b>BxC</b>	3.6571	1	3.6571	0.4080	NS
<b>AxC</b>	3.6571	1	3.6571	0.4080	NS
<b>AxBxC</b>	3.6571	1	3.6571	0.0398	NS
<b>Within</b>	2437.543	272	2437.543		
<b>Total</b>	2612.671	279	2612.671		

It may be noted in Table 1.4 that effect of culture (A) for global thinking style was found to be non-significant ( $F=0.129, P > .05, dfs 1$  and  $272$ ). It implies that there was no marked difference between Indian and Tibetan students with regard to global style.

Table 1.4 further shows that gender had significant effect for global style as obtained F- ratio (7.1556) was highly significant ( $P < .01$ , dfs 1 and 272) Mean score of female students superseded male students for global thinking style ( $M=15.45 < M=16.4$ ).It means that female students had the tendency to make use of global thinking style more than male students.

Table 1.4 further shows that stream C had significant main effect of global thinking style ( $F= 10.98$ ,  $P < .01$ , dfs 1 and 272) mean value of science students ( $M=16.52$ ) was higher than the mean value of arts students ( $M=15.34$ ). It leads to the conclusion that students of science stream had more inclination towards global thinking style in comparison to students of arts stream.

As regards interaction effects of A x B, B x C and A x C, factors for global thinking style, they were not found to be significant (0.05) as F-ratios for these interactions were much less than the required F-values. It means that culture (A) had similar effect for two levels of gender (males and females) or gender had similar effect on two levels of stream (Science and Arts) with regard to global thinking style. Also culture had same effect on stream with reference to global style.

Table 1.4 shows that A x B x C interaction effect was also found non-significant ( $F=0.398$ ,  $P > .05$ , dfs 1 and 272). It conveys that culture, gender and stream combined together had no significant influence on global style. In other works A x B interaction was independent of factor ‘C’ (Stream), B x C interaction was independent of factors A (culture) and A x C interaction was independent of factor B (Gender).

Table 1.5 provides a summary of Three-Way analysis of variance with reference to local styles

**Table 1.5 2x2x2 ANOVA for local Style.**

Source of Variation	SS	df	MS	F-Ratio	Significance
Culture A	85.8035	1	85.8035	10.1285	**
Gender B	114.4321	1	114.4321	13.5080	**
Stream C	0.175	1	0.175	0.0206	NS
A x B	27.0321	1	27.0321	3.1909	NS
B x C	44.0035	1	44.0035	5.1943	*
A x C	1.2892	1	1.2892	0.1521	NS
A x B x C	1.0321	1	1.0321	0.1218	NS
Within	2304.229	272	8.471429		
Total	2577.996	279			

Table 1.5 discloses that main effect of culture for local thinking style was highly significant ( $F= 10.128$ ,  $P < .01$ , dfs 1 & 272). It implies that students of Indian and Tibetan Culture were markedly different on local thinking style. The mean value of local thinking style for

Indian culture group was greater than that of mean value for Tibetan culture group. ( $M=18.91 > M=17.8$ ). On the basis of the observation it may be concluded that the students belonging to Indian culture were more prone to use Local thinking style than students belonging to Tibetan culture.

Table 1.5 further indicates that F-ratio (13.508) corresponding to gender effect was found to be statistically significant at 0.01 level of significance. It shows that male and female students had different levels of inclination for the use of local thinking style. Since mean score of female group ( $M=18.99$ ) was greater than the mean scores of male group ( $M=17.71$ ). It may be inferred that female students were superior to male students with regard to use of Local thinking style. However no significant effect was found for stream. Meaning thereby that the students of science and arts stream were similar with respect to use of local thinking style ( $F= 0.020, P >.05, \text{dfs } 1 \text{ \& } 272$ ).

Table 1.5 reveals that interaction effect of factors A and B was non-significant ( $F= 5.1994, P >.05, \text{dfs } 1 \text{ and } 272$ ). It leads to the conclusion that effect of A factor (Culture) was similar for two levels of 'B' (gender).

Another interaction effect of factors B and C (gender & stream) was found to be highly significant ( $F=5.194, P <.01$ ). It implies that gender had differential effect for two levels of stream i.e. Science and Arts. In other words the difference between local thinking styles mean scores of male and female students in science was highly significant from the difference between local thinking style mean scores of male and female students in arts group.

Interaction effect of A x C (culture and stream) was not found to be significant ( $F=0.222, P >.05, \text{dfs } 1 \text{ and } 272$ ).

This conveys that effect of cultures was the same for two levels of stream (i.e. Science and Arts). The three factor interaction between A, B and C factors was also non significant ( $F= 0.889, P >.05, \text{dfs } 1 \text{ and } 272$ ). It implies that the interaction between culture (A) and gender (B) was similar for the two levels of factor C i.e. stream (science and arts)

Summary of the Three- Way-ANOVA in context of liberal style is presented in Table 1.6 that follows:-

**Table 1.6 2x2x2 ANOVA for Liberal Style**

Source of Variation	SS	df	MS	F-Ratio	Significance
<b>Culture A</b>	128.9286	1	128.9286	13.9391	**
<b>Gender B</b>	44.8	1	44.8	4.8437	*
<b>Stream C</b>	2.4142	1	2.4142	0.2610	NS
<b>A x B</b>	40.1285	1	40.1285	4.3385	*
<b>B x C</b>	19.5571	1	19.5571	2.1144	NS
<b>A x C</b>	2.0571	1	2.0571	0.2224	NS
<b>A x B x C</b>	8.228571	1	8.228571	0.8896	NS
<b>Within</b>	2515.829	272	9.24937		
<b>Total</b>	2761.943	279			

F-ratio (13.939) was significant at .01 level of confidence. It corresponds to the main effect of culture on liberal style. It implies that the students belonging to Indian and Tibetan cultures differed significantly with regard to liberal style preference. The mean difference of two culture groups was in favour of Indian culture ( $M=19.59 > M=18.24$ ). From this it may be concluded that students of Indian culture had more liking for the use of Liberal style than Tibetan students.

The F-ratio (4.843) corresponds to main effect of gender. It was significant at .05 level of significance. It indicates that male and female students differed significantly with regard to liberal style. Further, female students more preferred the use of liberal style than their counterpart male students as the mean of latter group was greater than the former group ( $M= 18.51 < M =19.31$ ).

The third F-Ratio (0.261) was much lower than the required F-ratio to be significant at .05 levels. It leads to the inference that there was no statistical significant difference between uses of liberal style by the students of two streams. In other words students of science and arts stream were similar in the use of liberal style. F-ratio (4.338) in respect of interaction effect of A x B (culture x gender) was found to be significant at .05 level of confidence. It means that effect of culture was not independent of gender.

Other two-factor interactions (B x C, and A x C) were non-significant. It points to the fact that effect of gender was not dependent on stream and effect of culture was also not dependent on stream.

Table 1.6 also makes clear that three-factor interaction (A x B x C) was non-significant ( $p > .05$ ,  $F= 0.889$ ). It means that interaction effect of Ax B (Culture & Gender) was independent of stream.

The results obtained from Three-Way-ANOVA have been summarized in table 1.7.as follows-

**Table 1.7 2x2x2 ANOVA for Conservative Style**

Source of Variation	SS	df	MS	F-Ratio	Significance
Culture A	221.432	1	221.4321	21.4130	**
Gender B	9.2892	1	9.2892	0.8982	NS
Stream C	73.0321	1	73.0321	7.0624	**
A x B	7.2321	1	7.2321	0.69936	NS
B x C	2.2321	1	2.2321	0.2158	NS
A x C	0.175	1	0.175	0.01692	NS
A x B x C	3.4321	1	3.4321	0.33189	NS
Within	2812.74	272	10.3409		
Total	3129.56	279			

Table 1.7 shows that first F-ratio (21.41) with respect to main effect of culture was found to be highly significant, indicating that both groups of culture differed significantly for their liking for Conservative style of thinking. Higher mean of Indian students than Tibetan students ( $M=18.18 > M=16.4$ ) indicates that students of Indian culture had more inclination to use Conservative style of thinking than Tibetan students.

But non-significant F-Ratio (.898) in respect of gender shows that male and female students had similar tendency to use conservative style. So far, main effect of streams is concerned, it was found highly significant ( $F=7.062, P < .01, df=1 & 272$ ). Further, higher mean value of Conservative style in favour of arts stream group ( $M=17.8$ ), reveals that arts students had more tendency to use conservative style of thinking than their counterparts.

Table 1.7 further shows that none of the F-ratios for interaction effects of two-factors (A x B, B x C, A x C) came out to be significant at .05 level, indicating that culture, gender and stream factors jointly did not affect use of Conservative thinking style of secondary students.

Table 1.8 provides the statistical results of Three-Way-ANOVA with reference to Hierarchic thinking style.

**TABLE: 1.8 2x2x2 ANOVA for Hierarchic style**

Source of variation	SS	df	MS	F-Ratio	Significance
Culture A	64.12857	1	64.12857	8.11862	**
Gender B	78.22857	1	78.22857	9.903667	**
Stream C	22.85714	1	22.85714	2.893694	NS
A x B	18.51429	1	18.51429	2.343892	NS
B x C	98.41429	1	98.41429	12.45916	**
A x C	4.628571	1	4.628571	0.585973	NS
Ax B x C	2.414286	1	2.414286	0.305646	NS
Within	2148.514	272	7.89895		
Total	2437.7	279			

Table shows that out of three, two F-Ratios (8.118 and 9.90) turned out to be highly significant ( $P < .01$  Level). These values correspond to the main effects of culture and gender. From this it may be said that culture and gender had significant effect on the use of hierarchic thinking style. Higher mean value in favour of Indian culture ( $M=19.13$ ) points to the fact that students belonging to Indian culture had more tendency to use Hierarchic style than their counterparts ( $M= 18.17$ ).

Similarly, higher mean value in favour of female students ( $M=19.18$ ) reveals that female students had greater preference for the use of Hierarchic style than their male counterparts ( $M= 18 .12$ ). But stream had no effect on hierarchic thinking style. In other words, science and arts students had similar preferences for hierarchic thinking style.

As regards interaction effects, except B x C, none was found to be significant at 0.5 levels. Significant B x C interaction effect suggests that effect of 'A' (Gender) was dependent on two levels of stream C (i.e. science and arts).

A summary of Three-Way-ANOVA with reference to monarchic thinking styles is given below in tables 1.9 that follow

**Table 1.9 2x2x2 ANOVA for Monarchic Style**

Source of variation	SS	df	MS	F-Ratio	Significance
<b>Culture A</b>	286.175	1	286.175	34.04247	**
<b>Gender B</b>	94.88929	1	94.88929	12.13587	**
<b>Stream C</b>	45.80357	1	45.80357	5.832472	*
<b>A x B</b>	36.43214	1	36.43214	4.659492	*
<b>B x C</b>	2.603571	1	2.603571	0.332984	NS
<b>A x C</b>	0.432143	1	0.432143	0.055269	NS
<b>A x B x C</b>	2.232143	1	2.232143	0.28548	NS
<b>Within</b>	2126. 743	272	7.818908		
<b>Total</b>	2575.111	279			

It may be seen in table 1.9 that the main effects of culture, gender and stream were significant for Monarchic thinking style as F-ratios for the culture and gender were found to be significant at .01 levels and F-ratio for stream was found to be significant at .05 levels. Based on mean values of Monarchic style of thinking for various subgroups of students preferred use of Monarchic style more than Tibetan students ( $M= 20.14 > M= 18.19$ ). Further, female students had more preference for the use of Monarchic style than their counterpart's male students. ( $M=18.59 < M= 19.75$ ); and arts stream students had more preference for the use of Monarchic style than science stream students.

It may also be observed that A x B interaction was found to be significant at .05 levels. ( $F=4.65$   $P < .05$ ,  $dfs$  1 and 272.). From this it may be concluded that effect of culture was not independent of gender with reference to Monarchic style of thinking

However, interaction effects of B x C (gender and stream), A x C (culture and stream) and A x B x C (culture x Gender x Stream) were non – significant at .05 level of significance. From this it may be said that joint effects of gender and stream, culture and stream, and culture, gender and stream did not exist with reference to Monarchic thinking Style.

Table 1.10 provides a summary of Three-Way-ANOVA with regard to oligarchic style.

**Table 1.10 2X2X2 ANOVA for Oligarchic style**

Source of variation	SS	df	MS	F-Ratio	Significance
<b>Culture A</b>	154.5143	1	154.5143	12.92439	**
<b>Gender B</b>	103.2143	1	103.2143	8.633386	**
<b>Stream C</b>	12.01429	1	12.01429	1.004938	NS
<b>A x B</b>	53.15714	1	53.15714	4.446343	*
<b>B x C</b>	48.05714	1	48.05714	4.019752	*
<b>A x C</b>	1.157143	1	1.157143	0.09679	NS
<b>A x B x C</b>	14.62857	1	14.62857	1.223611	NS
<b>Within</b>	3251.829	272	11.95525		
<b>Total</b>	3638.571	279			

It may be observed in table 1.10 that first F-ratio (12.924) came out to be highly significant ( $P < .01$ ,  $df$  1 and 272). It conveys that main effect of culture existed on Oligarchic style. Tibetan senior secondary students had more preferences for Oligarchic style than Indian students. ( $M=16.69 < M=18.17$ ) Hence it may be said that the Tibetan culture was more favorable for the use of Oligarchic thinking style.

Second F ratio (8.633) was also significant at .01 levels. This indicates that the gender had marked effect on the use of Oligarchic style .Since female students had greater mean value than male students ( $M=16.82 < M=18.04$ ), it could be said that the female students were more inclined to use oligarchic thinking style in comparison to male counterparts .

The third F-ratio (1.005) was non-significant. It suggests that there was no significant effect of stream on the use of oligarchic style. In other words, students of science and arts streams were having similar tendency to use oligarchic thinking style.

Table 1.10 further shows that interaction effect of ‘A’ and ‘B’ factors with reference to oligarchic style was significant at .05 level. It means that the effect of culture was dependent on gender for oligarchic style. There was difference in the effect of culture for male students and female students.

B x C Interaction effect in oligarchic style was also significant at .05 levels. It implies that there was a differential effect of gender for two levels of stream i.e. Science and Arts.



However, interaction effect of A x C factors was not significant at .05 level. It means that effect and culture was the same for two levels of stream (science and Arts)

Table 1.10 further shows that interaction effects of three factors A,B, and C (culture , Gender and stream ) was non-significant (f= 1. 223, P > .05) .This suggests that interaction between A and B was not dependent on interaction effects of B x C and A and C . All the three two factor interaction effects were independent of each other.

A summary of three ways ANOVA has been presented in table 1.11 that follows:-

**Table 1.11 2x2x2 ANOVA for Anarchic style**

Source of variance	SS	df	MS	F-Ratio	Significance
<b>Culture A</b>	21.175	1	21.175	2.107317	NS
<b>Gender B</b>	104.4321	1	104.4321	10.393	**
<b>Stream C</b>	4.889286	1	4.889286	0.486577	NS
<b>A x B</b>	0.089286	1	0.089286	0.008886	NS
<b>B x C</b>	0.089286	1	0.089286	0.008886	NS
<b>A x C</b>	7.889286	1	7.889286	0.785135	NS
<b>A x B x C</b>	9.289286	1	9.289286	0.924462	NS
<b>Within</b>	27.33.143	272	10.04832		
<b>Total</b>	2880.996	279			

This may be seen in Table 1.11 that except one F-ratio (10.393), no F-ratio was significant (P >.05, dfs 1 and 272),this significant F ratio corresponds to main effect of gender indicating that there existed significant difference between male and female students with regard to the use of Anarchic thinking style. Depending on their mean scores it could be said that female students had more tendency to use this thinking style as compared to their male counterparts. (M= 17.64 < M=18.88).

Interaction effects between culture and gender (A x B), between gender and stream (B x C), and Between Culture and Stream (A x C) were non-significant. Further interaction effect of A x B x C was also non-significant.

A summary of Three-Way-ANOVA with reference to internal thinking style has been presented in table 1.12 that follows:

**Table 1.12 2x2x2 ANOVA forInternal Style**

Source of variance	SS	df	MS	F-Ratio	Significance
<b>Culture A</b>	260.3571	1	260.3571	23.62146	**
<b>Gender B</b>	7.557143	1	7.557143	0.685638	NS
<b>Stream C</b>	7.557143	1	7.557143	0.685638	NS
<b>A x B</b>	10.41429	1	10.41429	0.944858	NS
<b>B x C</b>	0.128571	1	0.128571	0.011665	NS
<b>A x C</b>	37.15714	1	37.15714	3.371161	NS

<b>A x B x C</b>	0.7	1	0.7	0.063509	NS
<b>Within</b>	2998	272	11.02206		
<b>Total</b>	3321.871	279			

A perusal of table 1.12 reveals that F-ratio (23.621) was highly significant. It corresponds to the effect of culture. This means that students of Indian and Tibetan culture were significantly different with regard to the use of Internal thinking style .Based on their means it could be said that Indian students were superior to Tibetan students with regard to use of Internal thinking style (M=18.44 > M=16.51).

Table 1.12 further reveals that main effect of gender and main effect of stream were non-significant for the use of Internal thinking style. Two factor interaction effects were also non-significant .In other words, interaction effect of culture and gender (A x B), interaction effect of gender and stream (B x C), and interaction effect of culture and stream were not found significant for Internal thinking style. It may also be observed in Table that A x B x C interaction effect i.e. joint effects of culture, gender and stream was also non-significant at .05 level for Internal thinking style.

Table 1.13 presents a summary of Three-Way-ANOVA of variance with regard to external thinking style

**Table 1.13 2x2x2 ANOVA for External style**

Source of variation	SS	df	MS	F-Ratio	Significance
<b>Culture A</b>	0.003571	1	0.003571	0.000326	NS
<b>Gender B</b>	37.88929	1	37.88929	3.460-474	NS
<b>Stream C</b>	3.432143	1	3.432143	0.313462	NS
<b>A x B</b>	8.576	1	8.576	0.783165	NS
<b>B x C</b>	75.089929	1	75.089929	6.857995	**
<b>A x C</b>	59.43214	1	59.43214	5.428009	*
<b>A x B x C</b>	7.232143	1	7.232143	0.66052	NS
<b>Within</b>	2978.171	272	10.94916		
<b>Total</b>	3169.825	279			

A perusal of F- ratio given in table 1.13 reveals that main effects of culture ,gender and stream turned out to be non-significant (p >.05, df 1 and 272) as the corresponding F-ratios were less than F-table value . It further means that students belonging to Indian and Tibetan cultures did not differ significantly with regard to external thinking style. Also, male and female students had similar tendency to use external thinking style. And there did not exist significant difference in external thinking style of science and arts students.

F-ratio (0.783) was also non- significant at .05 level .It implies that main effect of ‘A’ (Culture), factor was independent of factor ‘B’ (Gender) or vice-versa.

However, interaction effect of B x C and A x C factor came out to be significant at .01 and at .05 level respectively. From this it may be said that effect of 'B' (gender) was dependent on factor 'C' (stream) and effect of 'A' (culture) was also dependent on factor 'C' (stream)

Table 1.13 further indicates that A x B x C interaction effect was not statistically significant ( $f=0.850$ ) for External thinking style. It implies that A x B interaction was almost the same for two levels of factor 'C' (science and arts) or B x C interaction was almost same for two levels of factor (culture) 'A' or A x C interaction was almost the same for levels of factor 'B' (Gender).

### **Discussion of the Results**

Indian students showed greater preference for Legislative, Executive, Local Liberal, Conservative, Hierarchic, Monarchic and Internal style than their counterparts whereas Tibetan students were higher than Indian in the use of Oligarchic style indicating the main effect of culture. The obtained findings was not to the line of previous studies by **Zhang et al (2012)** which ascertained validity of Sternberg's theory of mental self Government for Tibetan minority university students and to compare thinking styles of Tibetan students of Han Chinese majority students. In this study, compared with Han Chinese students, Tibetan students showed more inclination towards norm referenced thinking styles and less liking for creativity generating thinking styles. Same sort of results were expected in context of Indian vs. Tibetan students which were lacking in the study.

female students had significantly stronger preference than Male students for Legislative, Executive, Judicial, Global, Local, Liberal, Hierarchic, Monarchic, Oligarchic, and Anarchic thinking styles. These results appear to be inconsistent with several previous studies, for example **Grigorenko and Sternberg (1997), Zhang 1999, Gridley (2006) and Chhabra 2008** did not report any gender difference in thinking style based on mental self Government Model of Sternberg's. But a number of studies have indicated that gender effect existed in thinking style. For instance, **Zhang and Sach 1999, Sood (2000), Nora (2000), Verma (2001), Verma (2001b), Chen (2001), Gillers and Sternberg (2001) Zhang and Siller and Sternberg (2002), Kumari (2003), Verma and Sharma (2003), Tafti and Babali (2007), Sheng-Pin Hasiag, (2009) Murphy (2009), Sood (2010)** reported significant effect of gender with reference to certain thinking style. It appears convincing as gender being socialized variable has the characteristic to affect the style male and female do think.

Science students were higher on Global Thinking Styles and Arts students were higher on Legislative, Conservative and Monarchic thinking Style. Some previous studies have also stream related difference in thinking styles. **Sternberg and Gregorenko (1995)**

reported a significant effect of discipline/subject on thinking styles. Humanities teachers were found more Liberal than science teachers and science teachers were found more local than humanities teachers. **Zang and Sachs (1997)** found that students of natural science and technological subjects had more global thinking style than those in areas of social science and humanities.

### **Implications for Education:**

The study ascertained the difference in thinking styles of Indian and Tibetan culture groups of senior secondary students and it was revealed that thinking 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 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 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 thinking styles. These findings have the implications that variations in thinking 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 thinking 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, thinking styles should find an important place in school education to make it more meaningful and more effective.

### **References**

- Chhabra,P(2008)** *A study of thinking style of B.E.d. students in relation to self-esteem M.Ed Dissertation , SCOE,KU.*
- Chen, Chun Hsien (2001)** *Preffered Learning Styles and Predominant Thinking Styles of Taiwanese Students in Accounting Classes. Dissertation Abstracts International , 62 (3), 1113-A.*
- Dunn, R.Dunn, K.and Price, G.E. (1975)** *Learning style Inventory (LSI) Lawrence, Kans : Price Systems.*
- Gridley, M.C (2006)** *Preferred Thinking styles of professional Fine Artits. Creativity Research Journal, 18 (2), 247-248.*
- Kumar Raj (2006)** *A study of Cognitive and Learning Style among Tribal and Nontribal senior students of Himachal Pradesh.*
- Kumari , V .(2003)** *A study of Motivational , Learning strategies and thinking styles of University students in Relation to Gender , Residence and Study Track. M.E.d. Dissertations, HPU.*
- Mundim, M.C.B &Wechsler,S.M ( 2006)** *Creative style among organizational leaders. Boletin de psychologia V, VII, 15-32*
- Murphy, A. (2009)** *A comparison of the emotional Intelligence and thinking Styles of students in different University Study Fields. Doctoral Dissertation, University of south Africa.*
- Nora, L. (2000)** *A usefulness of Thinking Styles in Reflecting How individuals Think and Explaining School Performance M.A (Edu.) Dissertation,University of HongKong*
- Sagone, E.andCarli , M. Eide (2012)** *Creativity and thinking style in arts , sciences and humanistic high school department of education sciences , University of Catania*
- Sood, Monika (2010)** *A study of Thinking, learning and Problem solving styles of Teacher Trainees aid Function of their creativity and Gender Ph.D. Thesis Edu. H.P.U.*
- Sternberg R.J. (1997),Thinking styles.** *New York : Cambridge University Press.*
- Tafti and Babbli ,F. (2007)** *A study of Comparability of Thinking Styles with The field of studies and Creativity Of University Students . M.A Tesis, Alzahr University Iran.*
- VermaAmila (2001)** *Effect of Culture,gender and Stream on Students styles of thinking and Decision Making M.Ed. Dissertation,HPU.*
- VermaSaroj and Sharma, K (2003)** *Thinking Styles Among Prospective Secondary Teachers. PsycholinguaVol.33 (2), 101-108.*
- Yildizlar, M. (2011)** *Comparison of candidates Thinking style according to some Demographic Variables. International Online Journal of Educational Sciences,3(1), 294-320.*
- Zhang L.F. (2002)** *Are thinking styles and personality types Related? Educational Psychology, Vol.20 (3), 271-283.*
- Zhang, L, F &Sach .J (1997)** *Assessing thinking styles in the theory of mental self –government: A Hong Kong validity study .Psychology Reports, 81.915-928*