

A comparative study of learning styles of high school students of Nainital district with regard to their multiple intelligence

Janki Dhapola

P.G.T Teacher in Krishna Public School, Bilaspur, Chhattisgarh, India

Abstract

The purpose of the study was to compare the learning styles of high school students of Nainital district with regard to their multiple intelligence the collection of relevant data was based on the VAK Learning Style Self Assessment Questionnaire by Victoria Chislett and Multiple Intelligence Rating Scale by Mark R. Kaser. For the purpose of the study hundred students (50 Male and 50 Females) from 10 different C.B.S.E. affiliated schools of Nainital district were selected as subjects. The variables for this study were learning styles (dependent variable) and multiple intelligence (independent variable). On the basis of the available literature, feasibility, to the present study, the following criterion measures were selected: (1) Learning Styles (2) Multiple Intelligence. For the research study, t-test has been used as statistical technique at 0.05 level of significance.

It was concluded that there was similar preferences found in High school male students for learning styles with respect to logical, linguistic, musical, bodily-kinesthetic, spatial, interpersonal and intrapersonal intelligence. There is no significant difference between High School Male and Female students of Nainital District with regard to their multiple intelligences.

Keywords: learning styles and multiple intelligences

Introduction

The educational world is anticipating the challenges of 21st century. Many alternatives and diversified interpretations of concepts are available in every field of knowledge. The creator of such knowledge is the desire of a great genius to add to the treasure of knowledge by making innovative and dynamic academic efforts.

The dynamics of learning concepts provide a forum for opening dialogue and sharing ideas that give leverage to the multiple intelligences with an emphasis on learning for understanding.

The theory of multiple intelligences was formulated by Dr. Howard Gardner, a psychologist and professor at Harvard University's Graduate School of Education and Co-Director of Harvard Project Zero, accepted widely by educational psychologists and applied in a variety of ways in classrooms, the theory emphasizes *nine* unique intelligences through which individuals learn and teach new information. Gardner defined the first seven intelligences in *Frames of Mind: The Theory of Multiple Intelligences* (1983) and the last two in *Intelligence Reframed: Multiple Intelligences in the 21st Century* (1999). Although the theory of multiple intelligences was initially applied to elementary and secondary school grades, both researchers and practitioners agree that applications to post-secondary education are appropriate. Over the past decade, community colleges and universities are taking seriously student learning and student differences in learning.

Gardner (1983) asserts in *Frames of Mind* that differences count when it comes to being smart. Gardner states, "It's not how smart you are, it's how you are smart". Gardner's (1983) *Frames of Mind* provides an extensive review of brain research and interviews that support his theory that human intelligence is multifaceted rather than singular.

According to Gardner, "Intelligence is the ability to respond

successfully to new situations and the capacity to learn from one's past experiences".

Learning styles (also referred to as *cognitive styles*) are the different ways in which people process information in the course of learning. They include individual preferences in both perceptual organization and conceptual categorization that is, perceiving, thinking, remembering, and solving problems (Ausubel, 1968; De Cecco, 1974; Kagan, Moss, and Siegel, 1963; Messick, 1969). In addition, some investigators, such as Ausubel (1968), believe that learning styles are also a reflection of individual differences in personality and motivation.

Fleming's Vak/Vark Model

One of the most common and widely-used categorizations of the various types of learning styles is Fleming's VARK model (sometimes VAK) which expanded upon earlier Neuro-linguistic programming (VARK) models: visual learners; auditory learners; kinesthetic learners or tactile learners.

Fleming claimed that visual learners have a preference for seeing (think in pictures; visual aids such as overhead slides, diagrams, handouts, etc.). Auditory learners best learn through listening (lectures, discussions, tapes, etc.). Tactile/kinesthetic learners prefer to learn via experience-moving, touching, and doing (active exploration of the world; science projects; experiments, etc.).

Its use in pedagogy allows teachers to prepare classes that address each of these areas. Students can also use the model to identify their preferred learning style and maximize their educational experience by focusing on what benefits them the most.

According to Howard Gardner, intelligence is:

The ability to create an effective product or offer a service that is valued in a culture; a set of skills that make it possible for a

person to solve problems in life; the potential for finding or creating solutions for problems, which involves gathering new knowledge.

According to the tool and data available, the researcher has considered seven intelligences:

Verbal-Linguistic Intelligence:- Well-developed verbal skills and sensitivity to the sounds, meanings and rhythms of words
Mathematical-Logical Intelligence - ability to think conceptually and abstractly, and capacity to discern logical or numerical patterns.

Musical Intelligence:- Ability to produce and appreciate rhythm, pitch and timber

Visual-Spatial Intelligence:- Capacity to think in images and pictures, to visualize accurately and abstractly

Bodily-Kinesthetic Intelligence:- Ability to control one's body movements and to handle objects skillfully

Interpersonal Intelligence:- Capacity to detect and respond appropriately to the moods, motivations and desires of others.

Intrapersonal Intelligence:- Capacity to be self-aware and in tune with inner feelings, values, beliefs and thinking processes.

'Learning style' should be interpreted to mean an individual mixture of styles. Everyone has a mixture of strengths and preferences. No-one has exclusively one single style or preference. Here we are referring to Visual-Auditory-Physical, or Visual-Auditory- Tactile/Kinesthetic (or Kinaesthetic).

The original VAK concepts were first developed by psychologists and teaching (of children) specialists such as Fernald, Keller, Orton, Gillingham, Stillman and Montessori, starting in the 1920's. VAK theory is now a favourite of the accelerated learning community because its principles and benefits extend to all types of learning and development, far beyond its early applications.

The Visual-Auditory-Kinesthetic learning styles is a different perspective for understanding and explaining a person's preferred or dominant thinking and learning style, and strengths. Gardner's theory is one way of looking at thinking styles; The more perspectives one has, the better he see and understand one's own personality and learning styles, and the learning styles of employees, colleagues and staff.

According to the VAK model, most people possess a dominant or preferred learning style; however some people have a mixed and evenly balanced blend of the three styles.

Why is this important

Research has shown that students can perform better on tests if they change study habits to fit their own personal learning styles. For example, visual-learning students will sometimes struggle during essay exams, because they can't recall test material that was "heard" in a lecture. However, if the visual learner uses a visual aid when studying, like a colorful outline of test materials, he or she may retain more information. For this type of learner, visual tools improve the ability to recall information more completely.

A simple explanation of learning styles is this:

Some students remember best materials they've seen, some remember things they've heard, while others remember things they've experienced.

Materials and Methods

Selection of Subjects

Present study was undertaken to compare the learning styles of high school students with regards to their multiple intelligence.

For the purpose of the study hundred students (50 Male and 50 Females) from 10 different C.B.S.E. affiliated schools of Nainital district were selected as subjects. The variables for this study were learning styles (dependent variable) and multiple intelligence (independent variable).

Criterion Measures

On the basis of the available literature, feasibility, to the present study, the following criterion measures were selected: (1) Learning Styles (2) Multiple Intelligence.

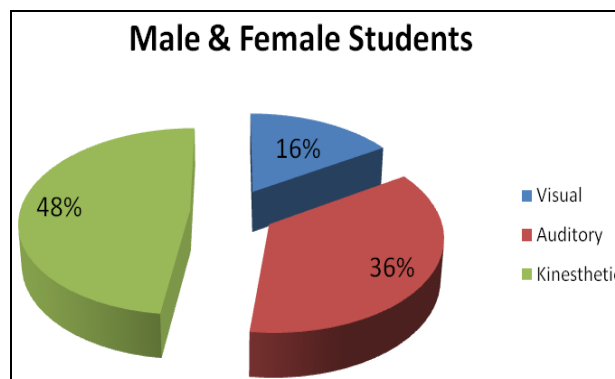
Analysis

The collection of relevant data was based on the VAK Learning Style Self Assessment Questionnaire by Victoria Chislett and Multiple Intelligence Rating Scale by Mark R. Kaser. For the research study, **t-test** has been used as statistical technique. The difference between boys and girls has been calculated with regard to each dimension of multiple intelligence. The level of significance for testing the hypothesis was set at 0.05 level.

Result and Discussion of Findings

The percentages of learning styles of High school students with regard to their multiple intelligence are calculated and shown by PIE chart.

Percentages of Learning style of male and female students in terms of linguistic and logical intelligence.



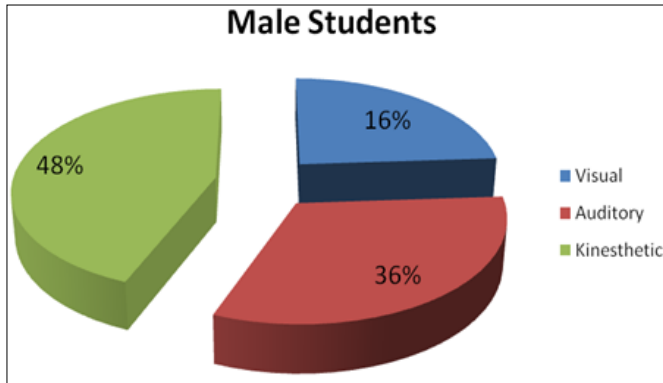
16% male and female students prefer visual learning style.
 36% male and female students prefer auditory learning style.
 48% male and female students prefer kinesthetic learning style.

Fig 1

Interpretation of Data for Male and Female Students

1. High school male and female students show similar preference for learning styles with respect to logical, linguistic intelligence.
2. 16% high school male and female students prefer visual learning style with regard to logical, linguistic intelligence.
3. 36% high school male and female students prefer auditory learning style with regard to logical, linguistic intelligence.

4. 48% high school male and female students prefer kinesthetic learning style with regard to logical, linguistic intelligence.

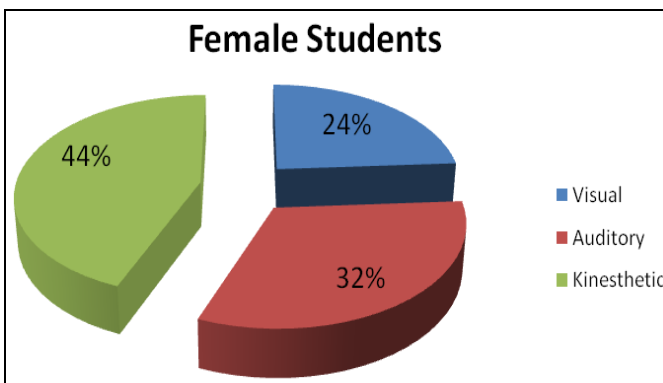


16% male students prefer visual learning style.
 36% male students prefer auditory learning style.
 48% male students prefer kinesthetic learning style.

Fig 2

Interpretation of Data for Male Students

1. High school male students show similar preference for learning styles with respect to logical, linguistic, musical, bodily-kinesthetic, spatial, interpersonal and intrapersonal intelligence.
 2. 16% high school male students prefer visual learning style with regard to all dimensions of multiple intelligence.
 3. 36% high school male students prefer auditory learning style with regard to all dimensions of multiple intelligence.
 4. 48% high school male students prefer kinesthetic learning style with regard to all dimensions of multiple intelligence.
- Percentages of Learning style of female students in terms of musical, bodily-kinesthetic, spatial, interpersonal and intrapersonal intelligence.



24% female students prefer visual learning style.
 32% female students prefer auditory learning style.
 44% female students prefer kinesthetic learning style.

Fig 3

Interpretation of Data for Female Students

1. High school female students show similar preference for learning styles with respect to musical, bodily-kinesthetic, spatial, interpersonal and intrapersonal intelligence.
2. 24% high school female students prefer visual learning style with regard to all musical, bodily-kinesthetic, spatial, interpersonal and intrapersonal intelligence.
3. 32% high school female students prefer auditory learning

style with regard to musical, bodily-kinesthetic, spatial, interpersonal and intrapersonal intelligence.

4. 44% high school female students prefer kinesthetic learning style with regard to musical, bodily-kinesthetic, spatial, interpersonal and intrapersonal intelligence.

To determine the comparison of learning styles of high school students with regard to their multiple intelligence t- test was employed. The analysis and interpretation of data pertaining to these have been presented in tables 1 to 8.

Table 1: Significance of Mean Difference among Male and Female Students In relation to Linguistic intelligence

| Group | N | Mean | S.D. | t-value (CR value) | Sig. of t-value | Verification of Ho |
|--------|----|-------|------|--------------------|-----------------|--------------------|
| Male | 50 | 13.40 | 2.13 | 0.369 | Insigni-ficant | Accepted |
| Female | 50 | 13.58 | 2.72 | | | |

*Significant at 0.05 Level with df, 98 = 1.96

Analysis

The above table – 1 indicates the value of Linguistic intelligence scores of Male and Female students. The mean of Linguistic intelligence scores of male and female students are 13.40 and 13.58 and S. D. is 2.13 and 2.72 respectively.

Interpretation

The above table-1 revealed insignificant difference between male & female students in relation to Linguistic intelligence as obtained ‘t’ value (0.369) is lower than required value (1.96) at 0.05 level.

The data pertaining to mean difference of male & female students is presented in figure 4.

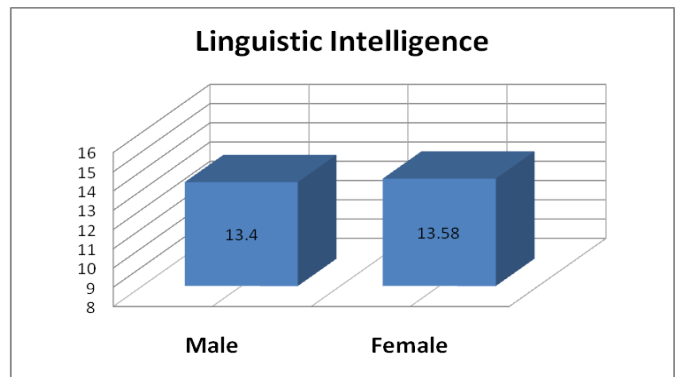


Fig 4

Table 2: Significance of Mean Difference among Male and Female Students In relation to Logical intelligence

| Group | N | Mean | S.D. | t-value (CR value) | Sig. of t-value | Verification of Ho |
|--------|----|-------|------|--------------------|-----------------|--------------------|
| Male | 50 | 14.20 | 2.76 | 0.654 | Insigni-ficant | Accepted |
| Female | 50 | 13.84 | 2.75 | | | |

*Significant at 0.05 Level with df, 98 = 1.96

Analysis

The above table-2 indicates the value of Logical intelligence scores of Male and Female students. The mean of Logical intelligence scores of male and female students are 14.20 and 13.84 and S.D. is 2.76 and 2.75 respectively.

Table-3 shows insignificant difference between male & female students in relation to overall Logical intelligence as obtained ‘t’ value (0.654) is lower than required value (1.96) at

0.05 level. The data pertaining to mean difference of male & female students is presented in figure 5.

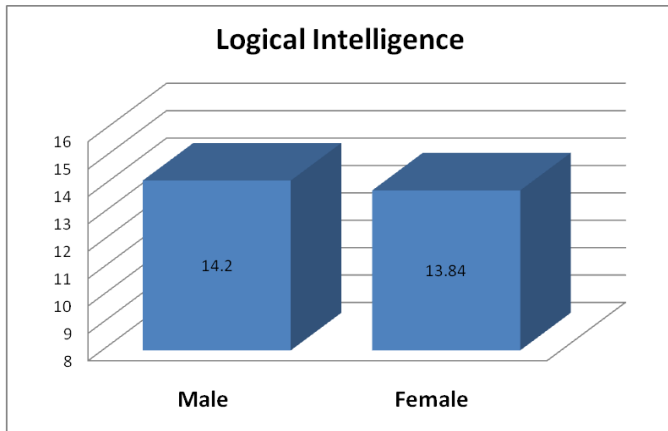


Fig 5

Table 3: Significance of Mean Difference among Male and Female Students In relation to Musical intelligence

| Group | N | Mean | S.D. | t-value (CR value) | Sig. of t-value | Verification of Ho |
|--------|----|-------|------|--------------------|-----------------|--------------------|
| Male | 50 | 15.68 | 2.96 | 0.919 | Insigni-ficant | Accepted |
| Female | 50 | 15.12 | 3.13 | | | |

*Significant at 0.05 Level with df, 98 = 1.96

Analysis

The above table-3 indicates the value of Musical intelligence scores of Male and Female students. The mean of Musical intelligence scores of male and female students are 15.68 and 15.12 and S.D. is 2.96 and 3.13 respectively. Table-3 revealed insignificant difference between male & female students in relation to Musical intelligence as obtained 't' value (0.919) is lower than required value (1.96) at 0.05 level. The data pertaining to mean difference of male & female students is presented in figure 6.

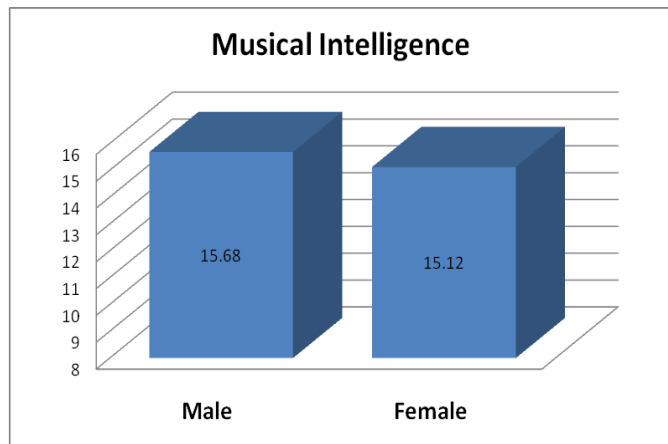


Fig 6

Table 4: Significance of Mean Difference among Male and Female Students In relation to Bodily intelligence

| Group | N | Mean | S.D. | t-value (CR value) | Sig. of t-value | Verification of Ho |
|--------|----|-------|------|--------------------|-----------------|--------------------|
| Male | 50 | 16.06 | 2.57 | 0.038 | Insigni-ficant | Accepted |
| Female | 50 | 16.04 | 2.66 | | | |

*Significant at 0.05 Level with df, 98 = 1.96

Analysis

The above table-5 indicates the value of Bodily intelligence scores of Male and Female students. The mean of Bodily intelligence scores of male and female students are 16.06 and 16.04 and S.D. is 2.57 and 2.66 respectively. Table-4 revealed insignificant difference between male & female students in relation to bodily intelligence as obtained 't' value (0.038) is lower than required value (1.96) at 0.05 level. The data pertaining to mean difference of male & female students is presented in figure 7.

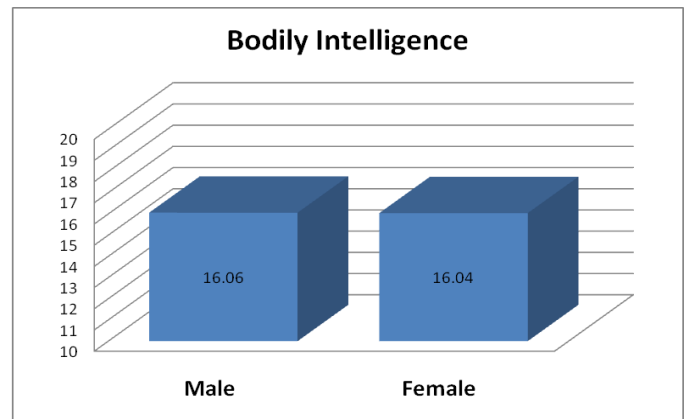


Fig 7

Table 5: Significance of Mean Difference among Male and Female Students In relation to spatial intelligence

| Group | N | Mean | S.D. | t-value (CR value) | Sig. of t-value | Verification of Ho |
|--------|----|-------|------|--------------------|-----------------|--------------------|
| Male | 50 | 13.82 | 2.28 | 0.911 | Insigni-ficant | Accepted |
| Female | 50 | 14.24 | 2.32 | | | |

*Significant at 0.05 Level with DF, 98 = 1.96

Analysis

The above table-6 indicates the value of spatial intelligence scores of Male and Female students. The mean of spatial intelligence scores of male and female students are 13.82 and 14.24 and S.D. is 2.28 and 2.32 respectively. Table-5 revealed insignificant difference between male & female students in relation to Spatial intelligence as obtained 't' value (0.911) is lower than required value (1.96) at 0.05 level. The data pertaining to mean difference of male & female students is presented in figure 8.

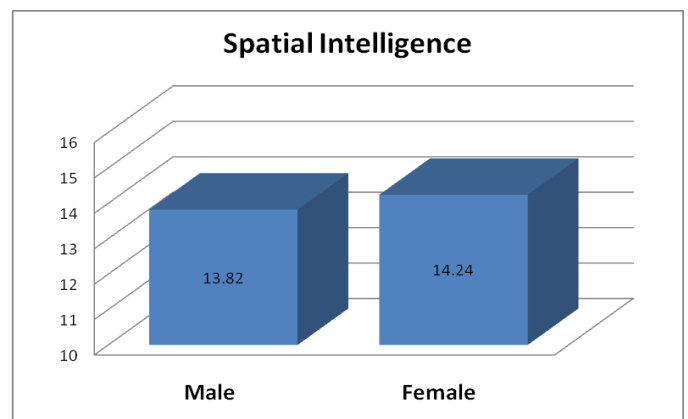


Fig 8

Table 6: Significance of Mean Difference among Male and Female Students In relation to Interpersonal intelligence

| Group | N | Mean | S.D. | t-value (CR value) | Sig. of t-value | Verification of Ho |
|--------|----|-------|------|--------------------|-----------------|--------------------|
| Male | 50 | 15.90 | 2.65 | 0.757 | Insigni-ficant | Accepted |
| Female | 50 | 15.40 | 2.82 | | | |

*Significant at 0.05 Level with DF, 98 = 1.96

Analysis

The above table-6 indicates the value of Interpersonal intelligence scores of Male and Female students. The mean of Logical intelligence scores of male and female students are 15.90 and 15.40 and S.D. is 2.65 and 2.82 respectively.

Table-6 revealed insignificant difference between male & female students in relation to Interpersonal intelligence as obtained 't' value (0.757) is lower than required value (1.96) at 0.05 level.

The data pertaining to mean difference of male & female students is presented in figure 9.

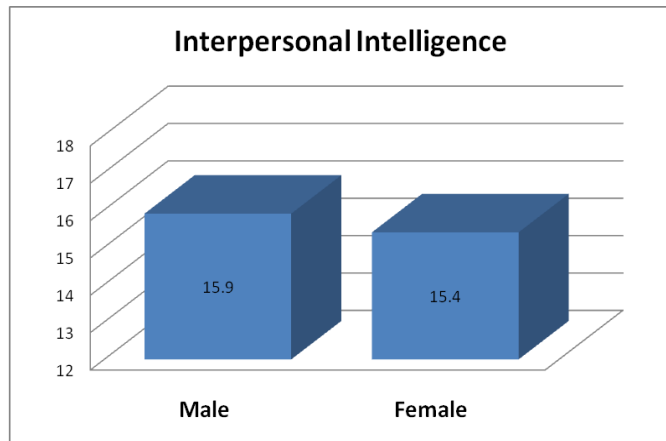


Fig 9

Table 7: Significance of Mean Difference among Male and Female Students In relation to Intrapersonal intelligence

| Group | N | Mean | S.D. | t-value (CR value) | Sig. of t-value | Verification of Ho |
|--------|----|-------|------|--------------------|-----------------|--------------------|
| Male | 50 | 13.74 | 2.46 | 1.85 | Insigni-ficant | Accepted |
| Female | 50 | 16.64 | 2.41 | | | |

*Significant at 0.05 Level with DF, 98 = 1.96

Analysis

The above table-7 indicates the value of Intrapersonal intelligence scores of Male and Female students. The mean of Intrapersonal intelligence scores of male and female students are 13.74 and 16.64 and S.D. is 2.46 and 2.41 respectively.

Table-7 revealed insignificant difference between male & female students in relation to Intrapersonal intelligence as obtained 't' value (1.85) is lower than required value (1.96) at 0.05 level.

The data pertaining to mean difference of male & female students is presented in figure 10.

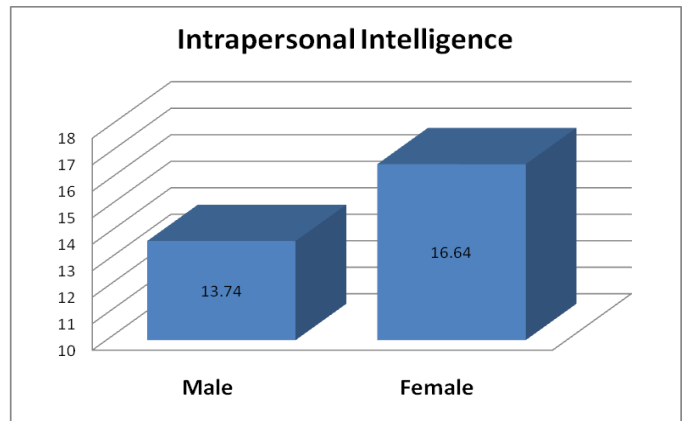


Fig 10

Table 8: Significance of Mean Difference among Male and Female Students In relation to Overall Multiple intelligence

| Group | N | Mean | S.D. | t-value (CR value) | Sig. of t-value | Verification of Ho |
|--------|----|--------|-------|--------------------|-----------------|--------------------|
| Male | 50 | 101.44 | 11.64 | 0.148 | Insigni-ficant | Accepted |
| Female | 50 | 101.02 | 16.38 | | | |

*Significant at 0.05 Level with DF, 98 = 1.96

Analysis

The above table-8 indicates the value of overall multiple intelligence scores of Male and Female students. The mean of overall multiple intelligence scores of male and female students are 101.44 and 101.02 and S.D. is 11.64 and 16.38 respectively.

Interpretation

Table-8 revealed insignificant difference between male & female students in relation to overall multiple intelligence as obtained 't' value (0.148) is lower than required value (1.96) at 0.05 level.

The data pertaining to mean difference of male & female students is presented in figure 11.

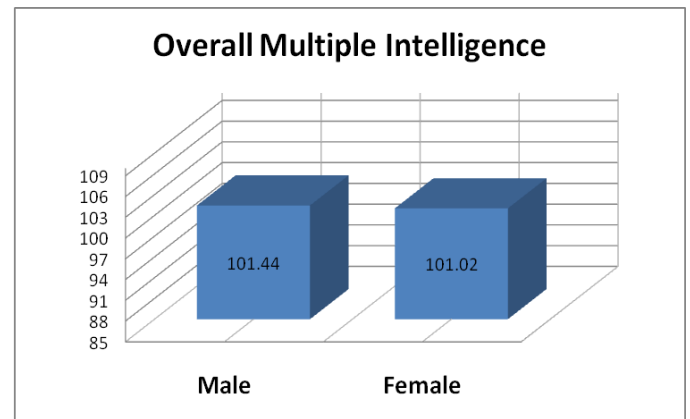


Fig 11

The analysis of data revealed insignificant difference between male & female students in relation to Linguistic intelligence as obtained 't' value (0.369) is lower than required value (1.96) at 0.05 level.

The analysis of data revealed insignificant difference between male & female students in relation to overall Logical

intelligence as obtained 't' value (0.654) is lower than required value (1.96) at 0.05 level.

The analysis of data revealed insignificant difference between male & female students in relation to Musical intelligence as obtained 't' value (0.654) is lower than required value (1.96) at 0.05 level.

The analysis of data revealed insignificant difference between male & female students in relation to Bodily- Kinesthetic intelligence as obtained 't' value (0.654) is lower than required value (1.96) at 0.05 level.

The analysis of data revealed insignificant difference between male & female students in relation to Spatial intelligence as obtained 't' value (0.911) is lower than required value (1.96) at 0.05 level.

The analysis of data revealed insignificant difference between male & female students in relation to Interpersonal intelligence as obtained 't' value (0.757) is lower than required value (1.96) at 0.05 level.

The analysis of data revealed insignificant difference between male & female students in relation to Intrapersonal intelligence as obtained 't' value (1.85) is lower than required value (1.96) at 0.05 level.

The analysis of data revealed insignificant difference between male & female students in relation to overall multiple intelligence as obtained 't' value (0.148) is lower than required value (1.96) at 0.05 level.

Conclusions

Within the limitations of the present study the following conclusion were drawn –

1. High school male students show similar preference for learning styles with respect to logical, linguistic, musical, bodily-kinesthetic, spatial, interpersonal and intrapersonal intelligence.
2. There is no significant difference between High School Male and Female students of Nainital District with regard to their multiple intelligence.

References

1. Boggs GR. Learning enhancement in the community college. Paper presented at the 10th Ann. Innovations for Learning Enhancement Conference at Ashland Community College, Ashland, KY. Concept to classroom: Tapping into MI. Retrieved November 20, 2002 from the World Wide Web: www.thirteen.org/edonline, 2002.
2. DiazLefebvre R. Multiple intelligences theory, creativity, and learning for understanding: Some pieces to the puzzle of learning. Paper presented at the 10th annual Innovations for Learning Enhancement Conference at Ashland Community College, Ashland, KY. 2002.
3. DiazLefebvre R, Finnegan P. Coloring outside the lines: Applying the theory of multiple intelligences to the community college setting. *Community College Journal*. October/November. 1997; 28-31.
4. Gardner H. *Frames of mind: The theory of multiple intelligences*. New York: Basic Books. 1983.
5. Gardner H. *Intelligence reframed: Multiple Intelligences in the 21st century*. New York: Basic Books. 1999.
6. Luzzo DA, Shearer CB. The application of multiple intelligences theory to career counseling. Paper presented

- at the annual meeting of the American Educational Research Association, Montreal, Canada. 1999.
7. Pashler H, McDaniel M, Rohrer D, Bjork R. "Learning styles: Concepts and evidence". *Psychological Science-in the Public Interest*, 2009; 9:105-119.
8. Smith MK, David A. Kolb on experiential learning. Retrieved, from: <http://www.infed.org/biblio/b-explrn.htm> 2001-2008; 17.
9. Honey P, Mumford A. *The Manual of Learning Styles*. Maidenhead, UK, Peter Honey Publications, 1982.
10. Honey P, Mumford A, *Using Your Learning Styles*. Maidenhead, UK, Peter Honey Publications 1983.
11. Gerald Co les. *The Learning Mystique: A Critical Look at "Learning Disabilities"*. Accessed. 1987-2008; 7.