

Multiple Intelligence and Learning Styles – A Correlational Study

Abstract

The purpose of the study was to find the relationship between male and female students at senior secondary level corresponding to their learning style and multiple intelligence. A sample of 250 boys and 250 girls studying in four senior secondary schools of Meerut city was randomly selected. Multiple Intelligence scale by the investigator herself and learning style inventory by Prof. K.S.Misra was used. Difference between male and female students corresponding to their relationship between multiple intelligence and learning style was determined by applying product moment correlation and significance of r (referred by H.E. Garret). After analysis of data it was found that female students show higher values of correlation between multiple intelligence and learning styles: enactive constructive, verbal constructive and constructive than male students.

Keywords: Multiple Intelligence, Learning Style, Senior Secondary Students.

Surbhi Agarwal

Research Scholar,
Deptt.of Education,
C.C.S. University,
Meerut

Introduction

The concept of multiple intelligence was given by Prof. Howard Gardner in 1983. There are nine dimensions of multiple intelligence according to Howard Gardner.

1. Linguistic intelligence ("word smart") is the ability to use words and language. It is the ability to think in words rather than pictures. It develops high auditory skills and elegant speaking.
2. Logical-mathematical intelligence ("number/reasoning smart") is the ability to use reason, logic and numbers. It is the ability to think conceptually in logical and numerical patterns making connections between pieces of information. It develops curiosity about the world around, asking lots of questions and liking to do experiments.
3. Spatial intelligence ("picture smart") is the ability to perceive the visual. It is the ability to think in pictures and need to create vivid mental images to retain information. It develops enjoyment looking at maps, charts, pictures, videos, and movies.
4. Bodily-Kinesthetic intelligence ("body smart") is the ability to control body movements and handle objects skillfully. It is the ability to express through movement. It develops a good sense of balance and eye-hand co-ordination. (e.g. ball play, balancing beams). It is the ability to remember and process information through interacting with the space around.
5. Musical intelligence ("music smart") is the ability to produce and appreciate music. It is the ability to think in sounds, rhythms and patterns. It develops immediate response to music either appreciating or criticizing whatever is heard. It develops extremely sensitivity to environmental sounds (e.g. crickets, bells, dripping taps).
6. Interpersonal intelligence ("people smart") is the ability to relate and understand others. It is the ability to see things from other people's point of view in order to understand how they think and feel. It is the ability to use both verbal (e.g. speaking) and non-verbal language (e.g. eye contact, body language) to open communication channels with others. It develops an uncanny ability to sense feelings, intentions and motivations. It develops great organizers, although they sometimes resort to manipulation. It develops to maintain peace in group settings and encourage co-operation.
7. Intrapersonal intelligence ("self smart") is the ability to self-reflect and be aware of one's inner state of being. It is the ability to understand inner feelings, dreams, relationships with others, and strengths and weaknesses.
8. Naturalistic intelligence ("nature smart") is the ability to discriminate among living things as well as sensitivity to other features of the

Suraksha

Professor,
Deptt.of Education,
C.C.S. University,
Meerut

natural world namely clouds, rock configurations, insects, fossils, butterflies, feathers, shells or dinosaurs etc. It is the expertise in the observation, recognition, classification and collection of plants and animals.

9. Existential intelligence ("cosmic smart") is the ability to be sensitive to, or have the capacity for, conceptualizing or tackling deeper or larger questions about human existence, such as the meaning of life, why are we born, why do we die, what is consciousness, or how did we get here. It is called "wondering smart", "cosmic smart", "spiritually smart" or "metaphysical intelligence".

Learning Style

"Learning style refers to the way one internally represents experiences and recalls or processes information." Karuna Shankar Misra (2012) Eleven learning styles have been considered for the study described as follows:

1. Enactive reproducing learning style indicates one's preference for action based concrete experiences. The emphasis is on imitation and practice. It is reproduction oriented.
2. Enactive constructive learning style indicates preferences for conceptualizing one's experiences based on the processing of enactive information.
3. Figural Reproducing learning style refers to one's preference for visual experiences related to making diagrams, chart, picture, maps and photographs. The emphasis is on imitation and practice. It is reproduction oriented.
4. Figural Constructive learning style refers to the preference for processing of figural experiences which will lead to conceptualizations.
5. Verbal Reproducing learning style refers to written or spoken information related to subject matter communicated through words.
6. Verbal Constructive learning style refers to the preference for reflective, accommodative and abstract thinking about subject matter so as to develop conceptualizations.
7. Enactive learning style refers to the learning best by doing or when learning involves their hands or other parts of body.
8. Figural learning style refers to the learning effectively through activity or tasks that involve visual approach such as reading notes, books, looking at wall displays, reading lists to organize thoughts etc.
9. Verbal learning style prefer teacher to provide verbal instruction in order to gain information in the classrooms during the teaching and learning process.
10. Reproducing learning style emphasizes on imitation and practice. It is reproduction oriented.
11. Constructive learning style indicates preference for conceptualizing one's experiences based on processing of information.

The Main Text

Literature suggests that learning style and multiple intelligence of an individual are correlated

with each other. Present study is undertaken to further explore the relationship between multiple intelligence and learning styles of male and female senior secondary students.

Objective of Study

To study relationship between male and female students corresponding to multiple intelligence and learning styles.

Review of Literature

Ahanbor, Zahra & Sadighi, Firooz (2010) aimed at investigating the relationship between learning styles and multiple intelligences in order to examine whether a combination of them could improve students' learning or not. Results indicated that all male and female students who took part in the study had linguistic, logical-mathematical, spatial, bodily-kinesthetic, musical, interpersonal, intrapersonal as well as naturalistic intelligences. As for the difference between males and females in terms of the types of intelligences, results demonstrated that males and females do not differ in terms of linguistic, logical – mathematical, spatial, body-kinesthetic, musical, interpersonal, and naturalist intelligences. However, a significant difference was noticed between males and females with regard to intrapersonal intelligence. Besides, statistically significant relationship was observed between male and female students' learning styles and their multiple intelligences.

Zare-ee, A. et al. (2010) conducted a study on the possible relationships between Iranian university students' Multiple intelligences (MI) and their learning styles. Survey data were collected from 300 randomly selected learners from the student population of the University of Kashan in central Iran. The results of the study showed that visual style was highly correlated with all kinds of multiple intelligences, very strongly correlated with interpersonal and intrapersonal intelligences at the 0.05 level (2-tailed) and strongly correlated with natural, musical, logical, existential, kinesthetic, verbal and visual-spatial intelligences at the 0.01 level (2-tailed). Strong, positive correlations between Auditory style and natural and existential intelligences at the 0.01 level (2-tailed) was also found. Auditory style and visual-spatial intelligences were not associated. The findings of this study have both theoretical and practical implications for effective teaching in multicultural classrooms.

Kiong T. T., Othman W. & Heong Y.M. (2009) conducted study on relationship between learning styles and multiple intelligences among the second year Bachelor of Technology and Education STP (A/E/J) direct intake students in Universiti Teknologi Malaysia. The whole population of 97 students was selected as sample. The Kolb Learning Styles Model (1976) and Gardner Multiple Intelligences Theory were used in this research. This is a quantitative approach research. The results showed that majority of the students tend to possess Diverger learning styles with emphasis on Intrapersonal Intelligence for the excellent level and Verbal-Linguistic for the low level. The Chi Square test for the 0.1 level of significance indicates that a

significant correlation exist between Kolb learning style with Musical Intelligence.

Statement of Aim

To study the relationship between male and female students at senior secondary level corresponding to their multiple intelligence and learning style.

Hypothesis of Study

There is no significant relationship between male and female students corresponding to multiple intelligence and learning styles.

Research Methodology

Method of the Study

Descriptive survey method was used to study the learning style and multiple intelligence of male and female students.

Sample

A sample of 250 boys and 250 girls studying in four secondary schools of Meerut city was selected

on random basis for the study. The sample was equal on age and socio-economic status.

Tools Used in the Study

Multiple intelligence scale (Surbhi Agarwal, Prof. Suraksha) prepared by the investigator herself and Learning style Inventory (Prof. K. S. Misra) was used in the study.

Statistical Techniques Used

Product moment correlation and significance of correlation (referred by H.E. Garret) were applied to see the significant relationship between variables.

Analysis of the Data

Testing of Hypothesis

Hypothesis

States that there is no significant relationship between male and female students corresponding to multiple intelligence and learning styles.

This hypothesis has been analysed by correlation and results are given as the following table 1.0.

Table 1.0: Relationship between Male And Female Students Corresponding To Multiple Intelligence And Learning Styles

S.No.	Correlation between Multiple Intelligence & Learning Styles	Male Students N = 250	Female Students N = 250	Significance of 'r'
1.	Multiple intelligence and enactive reproducing	0.181	0.036	1.87
2.	Multiple intelligence and enactive constructive	-0.066	0.147	2.5**
3.	Multiple intelligence and figural reproducing	0.033	-0.085	1.37
4.	Multiple intelligence and figural constructive	-0.025	0.111	1.62*
5.	Multiple intelligence and verbal reproducing	0.158**	0.193*	0.5*
6.	Multiple intelligence and verbal constructive	-0.085	0.106	2.25*
7.	Multiple intelligence and enactive	0.088	0.061	0.25
8.	Multiple intelligence and figural	0.0006	0.027	0.25
9.	Multiple intelligence and verbal	0.025	0.168**	1.75*
10.	Multiple intelligence and reproducing	0.181*	0.059	1.62*
11.	Multiple intelligence and constructive	-0.065	0.153**	2.62*

*Significant at 0.05, 0.01 level of significance

** Significant at 0.05 level of significance

It is evident from table 1.0 that significance of correlation values between multiple intelligence and learning styles: enactive constructive, verbal constructive and constructive have come out to be significant. Therefore, null hypotheses are rejected which means male and female students relate each other on aforesaid dimensions of learning styles and multiple intelligence. The hypotheses for enactive reproducing, figural reproducing, figural constructive, verbal reproducing, enactive, figural, verbal and reproducing have not come out to be significant. Therefore, all these null hypotheses are accepted. It means that males and females are independent from each other on these variables.

However, the analysis of significance of 'r' shows that Female students show higher values of correlation between multiple intelligence and learning styles: enactive constructive, verbal constructive and constructive than male students.

Findings

Findings of the research showed that there exists significant relationship between male and female students corresponding to learning styles: enactive constructive, verbal constructive and constructive and multiple intelligence. Study found that female students show higher values of correlation

between multiple intelligence and learning styles enactive constructive, verbal constructive and constructive than male students.

Discussion of Results

The results were in the accordance to studies conducted by Zare-ee, A. et al. (2010) and Kiong, T.T.; Othman, W. &Heong, Y.M. (2009). Zare-ee, A. et al. (2010) showed that visual style i.e. figural was highly correlated with all kinds of multiple intelligences, very strongly correlated with interpersonal and intrapersonal intelligences at the 0.05 level (2-tailed) and strongly correlated with natural, musical, logical, existential, kinesthetic, verbal and visual-spatial intelligences at the 0.01level (2-tailed). Strong, positive correlations between auditory style and natural and existential intelligences at the 0.01 level (2-tailed) was also found. Auditory style and visual-spatial intelligences were not associated. Kiong, T.T., Othman, W. &Heong, Y.M. (2009) showed that majority of the students tend to possess Diverger learning styles with emphasis on Intrapersonal intelligence for the excellent level and verbal-linguistic for the low level. A significant correlation exists between Kolb learning style with musical intelligence.

References

1. Abdi, Ali; Laei, S. &Ahmadyan, H. (2013). *The Effect of Teaching Strategy Based on Multiple Intelligences on Students' Academic Achievement in Science Course*. *Universal Journal of Educational Research*, 1(4), 281-284.
2. Abdi, Ali &Rostami, M. (2012). *The Effect Multiple Intelligences- Based Instruction on Student's Creative Thinking ability at 5th Grade in Primary School*. *Procedia-Social and Behavioral Sciences*, 47, 105-108.
3. Ahanbor, Zahra &Sadighi, Firooz (2010). *The Relationship between Multiple Intelligences, Learning Styles and Gender*. *Modern Journal of Language Teaching Methods*. 3(2).
4. Asthana, S.H. &Bhushan, Braj (2007). *Statistics for Social Sciences*.New Delhi: PHI Private Limited.
5. Atkin, M.J. (2006). *Research styles in science education*. *Journal of Research in Science Teaching*, 5(4), 338-345.
6. Best, J.W. (1961), *Research in Education*. New York: Prentice Hall Inc.
7. Butler, K.A. (1988). *Learning and teaching styles – In theory and practice. The learner's dimension*. 318-320, Columbia CT.
8. Diaz, D.P., & Cartnal, R.B. (1999). *Student's learning style, academic major and academic performance of college students*. *Journal of Agriculture Education*,40(1), 30-37.
9. Ebel, R.L., Frisbie, D.A. (1991). *Essentials of educational measurement*. 5th edition, Prentice hall of India Pvt. Ltd., New Delhi.
10. Gardner, Howard. (1983). *Frames of Mind: The Theory of Multiple Intelligences*. New York: Basic Books.
11. Gardner, H. (1984). *Assessing Intelligences: A Comment on Testing Intelligence without IQ Tests*.*The Phi Delta Kappan*, 65, 699-700.
12. Gardner, H. (1995). *Reflections on Multiple Intelligences: Myths and Messages*. *The Phi Delta Kappan*, 77, 200-203 and 206-209.
13. Gardner, H. & Moran, S. (2006). *The science of multiple intelligences theory: a response to Lynn waterhouse*. *Educational Psychologist*. 4(4), 227-232.
14. Gardner, L., Stough, C. (2002). "Examining the relationship between leadership and emotional intelligence in senior level managers." *Leadership & Organization Development Journal*, 23(2), 68-78.
15. Gardner, H., & Hatch, T.; Hatch (1989). "Multiple intelligences go to school: Educational implications of the theory of multiple intelligences." *Educational Researcher*.18 (8): 4.
16. Gardner, Howard. (1993). *Multiple Intelligences: The Theory in Practice*. New York: Basic Books.
17. Gardner, H. (1999). *Intelligence reframed: Multiple intelligence for the 21st century*. New York: Basic Books.
18. Gardner, Howard. (2000). *Intelligence Reframed: Multiple Intelligences for the 21st Century*. New York: Basic Books.
19. Gardner, H. (2004), *Changing Minds: The art and science of changing our own and other people's minds*, Harvard Business School Press, ISBN 1422103293
20. Gardner, J.K.Dr. &QualterParnela (2010). *Concurrent and incremental validity of three trait emotional intelligence measures*. *Australian Journal of Psychology*, 62(1), 5-13.
21. Garret, H.E. & Woodworth, R.S. (1985). *Statistics in psychology and education*. Bombay: Vakils, Feffer and Simons Pvt. Ltd.
22. Geiser, W.F., Dunn, R., Denig, S. & Beasley, M. (2000). *Effects of learning style awareness and responsive study strategies on achievement, incidence of study and attitudes of suburban 8th grade students*. *National forum of special Education Journal*, 9(E), 38-47.
23. Goldfinch, J. & Hughes, M. (2007). *Skills, learning styles and success of first-year undergraduates*. *Active Learning in Higher Education*, 8(3), 259-273.
24. Good, C.V. (1959). *Dictionary of education*. McGraw Hill Company, New York.
25. J.C. Xie&R.L.Lin (2009). *Research on Multiple Intelligences Teaching and Assessment*. *Asian Journal of Management and Humanity Sciences*, 4(2-3), 106-124.
26. Kassell, C. (1998). *Music and the Theory of Multiple Intelligences*. *Music Educators Journal*, 84, 29-32 and 60.
27. Kezar, A. (2001). *Theory of multiple intelligences: implications for higher education*. *Innovative Higher Education*, 26(2), 141-154.
28. Kiong T. T., Othman W. &Heong Y.M. (2009). *Relationship between Learning styles and Multiple intelligences among bachelor of technology and education in UniversitiTeknologi Malaysia*. *International conference on Education Research and Practice (ICERP)*.
29. Krätzig, Gregory P.; Arbuthnott, Katherine D. (2006). "Perceptual learning style and learning proficiency: a test of the hypothesis", *Journal of Educational Psychology*, 98 (1): 238–246. doi:10.1037/0022-0663.98.1.238.
30. Kyo, C.C. et al. (2010). *Identifying young gifted children and cultivating problem solving abilities and multiple intelligences*. *Learning and individual Differences*, 20, 365-379.
31. Lane, Carla (2000). *Implementing Multiple Intelligences and Learning Styles in Distributed Learning / IMS Projects*. *The Education Coalition*, 949, 369-386.
32. Loori, A.A. (2005). *Multiple intelligences: a comparative study between the preferences of males and females*. *Social Behavior and Personality*, 33(1), 77-88.
33. Lunenburg, C.F. & Lunenburg, R. M. (2014). *Applying Multiple Intelligences in the Classroom: A Fresh Look at Teaching Writing*. *International Journal Of Scholarly Academic Intellectual Diversity*, 16(1).
34. Mangal, S.K. (2002). *Advanced Educational Psychology*. New Delhi: PHI Learning Private Limited.

35. Mangal, S. K. (2010). *Statistics in Psychology and Education*. New Delhi: PHI Learning Private Limited.
36. McKenzie, W. (2005). *Multiple intelligences and instructional technology*. ISTE (International Society for Technology Education). ISBN 156484188
37. Misra, K.S. (2012). *Learning style inventory*. Agra: National Psychological Corporation.
38. Sahli, S. et al. (2011). *Comparison of learning preferences of Turkish children who had been applied cochlear implantation in Turkey and Germany according to theory of multiple intelligence*. *International Journal of Pediatric Otorhinolaryngology*. 75, 1576-1584.
39. Xie, J.C., Lin, R.L. (2009). *Research on Multiple Intelligences Teaching and assessment*. *Asian Journal of Management and Humanity Sciences*,4(2-3), 106-124.
40. Zare-ee A. et al. (2010). *The Relationship between Learning Styles and Multiple Intelligences*. 4th *International Technology, Education and Development Conference.. INTED 2010 Proceedings 2495-2504*.