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THE EFFECT OF PERCEPTUAL LEARNING STYLES ON THE ACADEMIC ACHIEVEMENT OF STUDENTS IN DEBRE MARKOS PREPARATORY AND HIGHER EDUCATION SCHOOL, ETHIOPIA

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Abstract:
The purpose of this study was to investigate if there are significant relationships and gender differences among perceptual learning styles preferences, and academic achievement of students. The target population was 1884 in Debre Markos preparatory school in 2005. A sample size of 210 participants was selected using stratified and simple random sampling technique from the population based on the roster of record office. A self-report questionnaire was used to collect data on perceptual learning styles preferences while current semester examination scores were used to determine the average academic achievement for each participant. The instruments were administered after piloting to determine their suitability, validity and reliability. The Cronbach's alpha reliability coefficient after piloting was 0.892. The questionnaire was revised to improve the reliability coefficient. The data collected from the sample size were analyzed by Pearson product movement correlation coefficient and independent sample t-test. The hypotheses were tested at a = 0.05.The findings indicated a significant positive relationship between students' perceptual learning styles preferences, and academic achievement. The findings also indicated that there were significant gender differences in perceptual learning styles preferences and academic achievement scores of students. It was recommended that providing welcome orientations, counseling services, short-term training and selecting classroom models are some of the solutions need to be given a due attention from teachers and school counselors.

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1. Introduction

Quality education is the process of developing the capacities and potentials of learners to make their life successful in a specific society or culture. (Sikhwari, 2004).In cultivating the capacities and potentials of learners, the new education and training policy has given a due attention to student centered learning/teaching approach (Bong, 2001). Research findings explained that learners' individual differences, their cognitive styles, learning styles and learning strategies are believed to be important in learning.

Still Lehman (2011) stated that learners' individual characteristics and their learning styles need to be taken into consideration during instruction. Perceptual learning styles are as an individual's preferred mode for perceiving, organizing, and retaining information. Perceptual learning preferences styles are also equip students on how to motivate to learn, determine and dwell on their strengths and interests. (Cuaresma, 2008) perceptual learning style' has been defined by various scholars mostly as a signal for individual differences. These differences may manifest itself in 'life styles' and even in personality types (Zhang & Sternberg 2005). Kolb (1984) and Honey and wing et al (1992) describe perceptual learning style as an individual preferred or habitual ways of processing and transforming knowledge. According to Kolb (1984), psychological attributes, resulted from individual differences, determine the particular strategies a person chooses while learning. On the other hand, Keefe (1987) emphasizes perceptual learning styles as cognitive, affective, and psychological traits that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment. Moreover, Dunn and Dunn (1986) hold that each individual's concentration on, mental processes, internalization and retain of new and difficult information stem from his specific perceptual learning style.

Perceptual learning styles were found to affect learners' learning behaviors. Learners having different learning style preferences would behave differently in the way they perceive, interact, and respond to the learning environment (Junko 1998). Since learners differ in their preferences to certain learning styles, it will be important for teachers to examine the variations in their students on the features of their perceptual learning styles, because the information about learner's preference can help teachers become more sensitive to the differences students bring to the classroom (Felder & Spurlin 2005). Adjustments can then be made to accommodate the students' varied needs. This study, therefore, aims at depicting the relationship of learners'

learning style preference and the overall academic achievement of a group of Malaysian students in a religious secondary school.

Teaching-learning approaches to address these varied learning styles. The responsibility for engaging in learning, including control, direction and focus, belongs to the individual learner. It is therefore, helpful to encourage students to identify and understand their perceptual learning styles. Dunn and Griggs (1998) said that findings of studies revealed that students learn more and like learning better when they are taught through their identified learning styles. LearningStyles.Net (2008) identified the benefits of understanding the perceptual learning styles of students. These are as follows: (1) permits students to identify how they prefer to learn; (2) provides a computerized graphical summary of each student's preferred learning style; called the Individual Learning Styles Profile; (3) suggests a basis for redesigning the classroom environment to complement many students' needs for sound, quiet, bright or soft light, temperature, or seating design; (4) sequences the perceptual strengths through which individuals should begin studying; shows how to reinforce new and difficult information for various individuals; shows how each student should do his or her homework; (5) indicates the methods through which students are likely to excel; (6) extrapolates information concerning which students are conforming or nonconforming and how to work with those who are nonconforming; (7) pinpoints the best time during the day for each student to be involved in required difficult subjects and thus permits grouping students for instruction based on peak energy times; (8)itemizes the types of students for whom snacks while learning may accelerate the learning process; and (9) suggests for which students analytic or global approaches to learning new and difficult material are likely to be important. Recognizing students learning styles not only profits the students but the teachers as well.

It is believed that it can help the teachers in developing an educational program that offers the most effective activities for the students. This idea conforms to that of Almasa & Parilah (2009) who stated that the typical students' learning style profile is changing in campuses today and that; there is much greater variation in the range of perceptual learning style preferences among students. Therefore, it would be wise to understand what perceptual learning style preferences are, and how to address them when preparing instructional materials and the entire lesson as well.

Besides, Bill (1998) concluded that knowing the perceptual learning style of the students can be beneficial in several ways. The instructor can orient his lecture toward those students with the modal learning style keeping in mind that some students may be at a disadvantage. By varying the explanations, the instructor can reach a larger proportion of the students. Knowing the perceptual learning styles can also be very

helpful when working on an individual basis with the student. Students should know their perceptual learning styles in order to make better use of their study time. Perceptual learning styles are simply different approaches or ways of learning.

Dunn and Dunn (1992) defined perceptual learning style as the way in which each learner begins to concentrate on, process, absorb, and retain new and difficult information. Furthermore, Dunn, Beaudry, and Klavas (1989) maintained that perceptual learning styles pertain to a biologically and developmentally imposed set of personal characteristics that make the same teaching method effective for some students and ineffective for others. The interaction of these elements occurs differently in everyone. Therefore, it is necessary to determine what is most likely to trigger each student's concentration, how to maintain it, and how to respond to his or her natural processing style to produce long term memory and retention. Perceptual learning styles are not abilities, but, rather, preferred ways of using one's abilities (Drysdale, Ross, & Schuyltz, 1997 as cited by Santrock, 2006). Experts identified the different perceptual learning styles as visual learners, auditory learner and tactile learners.

2. Statement of the Problem

Perceptual learning styles are very essentials for students to equip themselves with the necessary learning outcomes. In other words, perceptual learning styles are helpful for students to increase their retention capacity during instruction, study time and examination in storing and retrieving information what they want. In Ethiopian context, students do not know their most preferred perceptual learning style for better academic achievement. Then this showed that students do not consider and use their perceptual learning styles in doing their learning activities. At the same time, however, there are several research findings in literatures, the concepts of perceptual learning styles has not been investigated very well by researchers.

This study answered the following questions:

- What are the most preferred perceptual learning styles of students at preparatory school level?
- Is there a significant difference between social and natural science students in perceptual learning styles preferences?
- Is there a significant difference between female and male students in perceptual learning styles preferences?
- Is there a significant relationship between perceptual learning styles preferences and academic achievement of students?

This study has the following significances:

- The findings of this study are important for counselors as an input to identify students who need guidance and help in their academic performance.
- Not only these research findings are important for guidance and counselors it is important for NGO'S, school leaders and other concerned bodies to arrange training and orientation program to help students be confident, goal oriented and aware of their academic talents and capabilities.
- Finally, this research could be important for further investigation to other researchers in academic self-efficacy, self-concept, goal oriented behavior and academic achievement of students.

3. Research Methodology

3.1 Research Design

The descriptive research design was utilized in this study because the purpose of the study was to compare and describe the differences and relationships of perceptual learning styles and academic achievement of students.

3.2 Population of the study

There were 1038 male and 846 female students were grade eleven and twelve students who enrolled in Debre Markos higher education and preparatory school. This research population was stratified into four subpopulations considering their department and sex. In department, there were 1389 natural and 495 social science students.

3.3 Data Collection Tools

This research has given a due attention to describe the differences of practicing of perceptual learning styles across department and sex. In line with this objective, there were primary and secondary data organized in the form of scores. Whereas the primary data were developed from the scale questionnaire of perceptual learning styles filled by students, the secondary data (the average academic achievement scores) were taken from the record office of the school. The data collecting instrument used was the Perceptual Learning Style Inventory developed by Dunn and Dunn (1996). This instrument is composed of 32 items intended to determine the perceptual strengths related to the auditory, visual, tactile or kinesthetic learning styles practiced by students. This Learning Style Inventory was modified considering the context of Ethiopian students. For each statement the numerical values '5', '4', '3', '2' and '1' were given for five responses namely, strongly agree, agree, undecided, disagree and

strongly disagree respectively in case of positive statements. The scoring was reversed in case of negative statements.

3.4 Sampling procedures and Sample size

The researcher first gained approval for the research to be conducted on the school students from the director of the school. Once the researcher granted the permission, the sampling frame of the population was prepared from the roster of record office the school. These research subjects were divided in to four subgroups (stratum) based on department and sex. Each stratum made as a sampling frame from which the sample of the study could be taken out. What percentage of research participants were determined from the source list (Sampling frame) of each stratum through stratified sampling technique in proportion to the sizes of the population in the stratum. Once the sample sizes have been determined, the other step was simple random sampling which used to draw (select) the number of subjects determined from each stratum.

At the end, the name of subjects was written on a piece of paper from each stratum. Then, through the lottery system, the sample sizes were selected from each stratum. Then, 154 natural and 56 social science and 116 male and 94 female students were included in this study.

3.5 Data Collection Procedures

Once the permission from the director obtained, the average academic achievement scores of students included in the research was taken from the roster of record office. After a brief orientation, five data collectors collected the average academic achievement score of respondents from record office for two days.

In collecting the primary data, only students who volunteered to take part in the study were given questionnaires to complete during class time. The students then read the informed consent of the script describing the purpose and procedures of the research study, the fact that participation was voluntary. The questionnaire was translated into Amharic language for the ease of understanding. Students filled a questionnaire that consists of two parts. The first part asks participants to record their sex, department and current school GPA. The second part requested the respondents to rate the degree of their academic self-efficacy, self-concept, and goal-oriented behaviors from the instrument that took approximately 15-20 minutes to complete.

The data-collecting instrument was distributed just for 210 students. Nevertheless, six students did not fill the questionnaire based on the direction given in the first page. Yet four students failed to supply any demographic information. Hence,

these 18 participants were excluded from the analysis, leaving a final sample of 200 students

3.6 Method of Data Analysis

After the data were collected from the respondents, the analysis was made in inferential and descriptive statistics. From descriptive statistics, means are compared to assess the most preferred learning style preferences of students. At the same time, from inferential statistics independent T-test is used to analyze the existence of significant differences across department and sex among the mean scores of students in learning style preferences.

4. Results and Discussion

4.1 Results

The objective of this study has been to investigate the relationship of perceptual learning style preferences on academic achievement of students. After the data were collected from the respondents, it was organized in the form of scores from 1 strongly disagree to 5 strongly agree. This Chapter, therefore, presented the results of the data analysis in descriptive statistics (correlation, mean and standard deviation), and inferential statistics (independent t-test).

Table 1: Correlation Matrix of learning style preferences *academic achievement

No	Perceptual learning styles	Mean	SD	1	2	3	4
1	Auditory learning style	38.48	5.94	1			
2	Visual learning style	44.16	3.26	.772*	1		
3	Tactile learning style	36.54	4.90	.646*	.261*	1	
4	Academic achievement	70.84	6.75	.564*	.438*	.388*	1

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

As stated in Table 1, the result of the analysis presented in form of mean scores, standard deviations and Pearson product movement correlation coefficients. Regarding the mean scores, respondents seemed to have higher mean scores (M = 44.16) in visual learning style than auditory learning style (M = 38.48) and tactile learning style (M = 36.54) mean scores. This showed that most students have visual learning style preferences such as demonstrations, seeing diagrams, posters, charts and slides during instruction and their study time

On the other hand, the standard deviation for auditory learning style (SD = 5.94) is more likely higher than the standard deviation of tactile learning style (SD = 4.90) and

visual learning style (SD = 3.26). This result indicated that there was a great variation in auditory learning style preferences among the respondents

As shown in Table 1 the relationship between perceptual learning style preferences and academic achievement scores of students is positive and significant at 0.05. This indicated that those students who use auditory learning style preferences (r = .564) are more successful in their academic achievement scores compared with those students who use visual (r = .438) and tactile (r = .388) learning style preferences.

Table 1 also has shown that there was strong, moderate and significant relationship between auditory and visual learning style preferences (r =.772), and auditory and tactile learning style preferences (r =.646). These findings revealed that respondents used perceptual learning preferences interdependently in their learning tasks.

Table 2: Perceptual Learning Style preferences analysis across gender

Perceptual Learning Styles	Sex	N	Mean	SD	t-value	Sig.
Auditory learning style	Male	129	42.75	3.821	.	.001
	Female	92	38.55	4.260	5.17*	
Visual learning style	Male	129	44.05	3.113	4.12*	.001
	Female	92	41.20	5.711		
Tactile learning style	Male	129	37.900	3.158	7.036*	.001
	Female	92	34.011	3.521		

*Significant at p<0.05 (2 tailed)

As shown in Table 2 the independent t-test analysis revealed that there is statistically significant difference between male and female students mean scores in auditory learning style.

In other words, male students mean score (M = 42.75, p =.001) is significantly higher than female students did (M = 38.55, p = .001) in using auditory learning style. This result implies that male students are better in daily practicing of auditory learning style than female students.

This finding also indicates that male students are more likely to learn through active listening, group discussion and other hearing related academic activities compared with female students.

In Table 2, the independent t-test analysis still demonstrated that there are significant differences between male and female students in visual and tactile learning style preferences. In other ways, male students learn better than female students in use of visual and tactile learning style preferences.

Table 4: Perceptual Learning Styles preferences analysis across department

Perceptual Learning Styles	Department	N	Mean	SD	t-value	Sig.
Auditory learning style	Social science	56	44.43	3.14	8.34*	.001
	Natural science	155	37.51	4.62		
Visual learning style	Social science	56	45.15	4.81	5.41*	.001
	Natural science	155	41.42	5.28		
Tactile learning style	Social science	56	36.20	3.27	7.23*	.001
	Natural science	155	43.43	5.11		

*Significant at p<0.05 (2 tailed)

As shown in Table 2 the independent t-test analysis revealed that there is statistically significant difference between social science and natural science students mean scores in auditory learning style preferences. In other words, social science students mean score (M = 44.43, p = .001) is significantly higher than natural science students (M =37.51, p = .001) in daily practicing of auditory learning style. This result implies that social science students enjoy learning in active listening, group discussion and other hearing related academic activities.

Similarly, Table 2 demonstrated that there is a statistically significant difference between social scienceand natural science students means scores in visual learning style preferences. This means that, social science students mean score (M = 45.15, p = .001) is significantly higher than natural science students (M =41.42, p = .001) in the use of visual learning style. This result implies that social science students enjoy learning in reading, observing charts, figures and other visual related academic activities.

As shown in Table 2, there is statistically significant difference between social science and natural science students mean scores in tactile learning style preferences. This means that, natural science students mean score (M = 43.43, p = .001) is significantly higher than social science students (M =36.20, p = .001) in the use of tactile learning style. This result implies that natural science students enjoy learning in experimenting, practical activities for example, learning by doing, touching and manipulating the learning materials in laboratory and natural setting.

5. Discussion

Perceptual learning style is the manner in which a learner perceives, interacts with, and responds to the learning environment. This process of acquiring information involves the elements of the perceptual modalities such as visual, auditory and tactile. Keefe (1987) stated that the perceptual modality lies within the cognitive domain of learning styles and that perceptual response is both cognitive and affective in the sense that

preferred response is a biased initial reaction to information. They involve educating methods, particular to an individual that are presumed to allow that individual to learn best. Most people prefer an identifiable method of interacting with, taking in, and processing stimuli or information.

This research finding also indicated that the most preferred perceptual learning style among students was visual learning styles. This shows that most students enjoy learning through reading handouts, observing pictures, tables, charts and visual learning materials during instruction. In line with this finding, Dunn and Griggs (1998) studies revealed that students learn more and like learning better when they are taught through their identified learning styles. For example, those students who are visual learners learn best when the lesson is presented with pictures; visual aids such as overhead slides, diagrams and handouts.

Whereas auditory learners learn best when the lesson is delivered to students through group discussion, lecture, videos and other activities related with listening, tactile learners prefer to learn via experience—moving, touching, manipulating, active exploration of the world, science projects, experiments. This demonstrated that the instruction is expected to satisfy these learning styles diversity among students. 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.

The process of acquiring information through perceptual modalities (visual, auditory and tactile) is more likely different across sex (Rao, 2001). This research finding also supported that male students are significantly better than female students in use of perceptual learning styles (visual, auditory and tactile). However difficult it is to accommodate the gender diversity of learning preferences of students; teachers can minimize the gap through inclusive classroom instruction.

These research findings also revealed that there are statistically significant differences between social science and natural science students mean scores in auditory and visual learning style preferences. In other words, social science students are significantly higher than natural science students in learning through active listening, group discussion and other hearing related academic activities. Still social science students enjoy learning better than in reading, observing charts, figures, diagrams and other visual related academic activities. Similarly, studies (Reid, 1987) found that natural science students learn best in practical learning activities/tactile learning styles/ such as laboratory, practicum, internship, touching and experiments. On the other hand, social science students are more active in perceptual modalities (visual and auditory) during classroom instruction and study time. These students learn best in

group discussion, classroom and video lecture, listening tests, presentation of lessons with slides, charts, figures, pictures and diagrams

6. Conclusion

- The most preferred perceptual learning style used among preparatory students was visual learning style;
- There was positive and significant relationship between perceptual (visual, auditory and tactile) learning style preferences and academic achievement scores of students;
- Male students have shown significantly higher mean scores than female students in using perceptual (visual, auditory and tactile) learning style preferences;
- Natural science students have shown significantly higher mean scores than Social science students in using tactile learning style;
- Social science students have shown significantly higher mean scores than female students in using visual learning style.

7. Recommendations

Based on these findings, the following recommendations are given.

- Teachers should consider visual learning style preferences of students in preparing their lesson;
- Teachers are expected to use teaching methodology that can accommodate individual differences in the learning processes;
- Guidance and counselors should pay attention not only on the actual academic competency of female students but also on the awareness and its application of their learning style preferences;
- Natural science classrooms instructions should be supported with more practical activities;
- School leaders, counselors and educational supervisors are expected to arrange individual and group counseling sessions, orientation and short term training program to help raise students' level of awareness on perceptual learning style preferences.

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