

LEARNING STYLES, GENDER, SCHOOL TYPE AND ACADEMIC ACHIEVEMENT OF SECONDARY SCHOOL STUDENTS IN FCT ABUJA

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Abstract

This study investigated the influence of gender and school type on learning styles as well as the influence of learning style on academic achievement of Junior Secondary School students in the Federal Capital Territory, Abuja. The descriptive survey design was employed. Three hundred and seventy five students were sampled. The instruments used are: Multiple Choice Mathematics and English Achievement Test (MCMEAT) and Index Learning Style (ILS) questionnaire with well-established psychometric properties were used for the collection of the data. The statistical tools used in analyzing the data frequency counts, percentages, mean and Analysis of Variance. The results indicated that the students' learning style vary due to gender and school type; their academic achievement also vary due to their learning style. The influence of learning style presence was however not significant. It is therefore recommended that learning be given serious attention in planning and executing all educational programmes.

Key Words: Learning Style, Academic Achievement, Gender, School Type.

Introduction

Teachers today are faced not only with overcrowded classes and lack of learning materials, but with students of varying abilities who differ in the ways they process information. Some theorists and researchers (Kolb, Honey and Mumford, 1992) have argued that learning styles are not determined by inherited characteristics, but developed through experience. Styles are therefore not necessarily fixed, but can change over time even from one situation to the next. Learning style is an individual's way of learning or approach to learning which determines how the individual will utilize his various abilities to solve problems (Zinyahs, 2010).

The difference in approach in solving problems comes as a result of learning styles. It has been established that there are a variety of learning styles present in the classroom, such as convergence and divergence, assimilation and accommodation, field independence and field dependence, active and reflective, concrete and abstract, internal and external, sequential and global, sensing and intuitive, visual and verbal learners (Wehrwein, 2006). Students with their peculiar learning styles expect instructions appropriate to themselves. Students are capable of functioning in all four learning styles which include Active/Reflective, Sensing/Intuitive, Visual/Verbal and Sequential/Global but the preferred learning style of student varies from topic to topic

and concept to concept. Student learning styles vary among individuals, and it is important that teaching methods support a wide variety of learning styles in order to facilitate the best education possible.

Statement of the Problem

Concerns have been expressed over the difficulty faced by students in learning some subjects. Some teachers are not aware of the way their students prefer to learn Mathematics and English Language. Even if they are, they pay little attention to this knowledge. Mismatch between preferred learning style of students and those of teachers is one of the problems associated with students' learning style. The fostering of diverse styles of learning appear to have been neglected in the teaching of Mathematics and English Language. In some cases, a mismatch exists between students' learning style and teachers' teaching style which creates a kind of frustration between many students and teachers and it may be that this basic incongruence is the root of the dilemma connected with learning style in today primary and secondary schools.

The aim of this study is to examine variations in students' learning styles due to their gender and school type as well as find out the influence of learning style preferences on students' academic achievement. The research questions raised to guide the study are stated thus: (1) what is the learning style preference of JSS students in Gwagwala Area Council; (2) how do students learning style preference vary between male and female students; (3) what differences exist in students' learning style preferences due to their school type; and (4) what is the influence of learning style on academic achievement of secondary school students in FCT, Abuja. It is also hypothesized that there is no significant difference between students' academic achievement due to their learning style preference.

The study was focused on Junior Secondary School students in Gwagwalada Area Council of Federal Capital Territory, Abuja. In this study, only four different learning styles were used. They were Active/Reflective, Sensitive/Intuitive, Visual/Verbal and Sequential/Global. The academic achievement was based on test scores in Mathematics and English Language.

Previous Studies

Research on learning style demonstrates that individuals differ in their learning style and that no single delivery system is optimal for all students (Paul, Bojanczy& Lanphear, 1994). Some studies show a positive relationship between academic achievement and the converging learning style (Rutz 2003, Boyatzis and Mainemelis 2000), some show academic performance privileges for converging and assimilating learning styles (Malcom, 2009; Lynch, Woelfl, Steele, and Hanssen, 1998; Newland and Woelfl, 1992; Kolb, 1984) and Oughton and Reed (2000) found that assimilating and diverging learners were the most productive on concept mapping. This clearly shows that caution must be observed by researchers in evaluating performance based on a single outcome measure, as each learning style has its strength in specific tasks.

Many experimental studies have been conducted to determine the effects of specific sequential versus simultaneous instructional approaches on identified analytic and global students - Cavanaugh (1982); Bruno (1990). Early researchers found that analytic students who were taught analytically and global students who were taught globally achieved statistically higher achievement test scores with complementary, rather than with dissonant instructional strategies. Gifted and underachieving students have significantly different learning styles and do not perform well with the same methods.

Conversely, gifted students in nine diverse cultures with talents in either athletics, art, dance, leadership, literature, languages, or music evidenced essentially similar learning style characteristics to other students with the same talent (Milgram & Price, 1993:). This is an indication that variations can be found in students learning styles which may be attributed to a wide range of factors.

Wehrwein, Lujan & DiCarlo (2007) carried out a study among undergraduate physiology majors enrolled in a capstone physiology laboratory at Michigan State University and found on assessment for gender difference in learning style preference that 54.2% of females and only 12.5% of males preferred a single mode of information presentation. Thus, male and female students have significantly different learning styles.

Choudhary, Dullo and Tandon (2011) studied a total of 155 students also using the VARK questionnaire. Result indicated that males (92.98%) and females (76.27%) preferred information to reach them via multiple sensory modalities. In addition, only 15.52% of all students (6.25% males and 23.75% females) preferred using a single sensory modality for information intake. There was a significant gender difference in the percentages of male and female students who preferred multimodal or unimodal styles of information presentation ($p < 0.05$). It seems therefore that both males and females preferred multimodal learning but to different degrees. Significant variation between the genders were revealed ($p < 0.05$).

Methodology

The target population of this study comprised all students in Junior Secondary Schools in Gwagwalada Area Council of FCT, Abuja. A sample of 375 participants, from both public and private schools were drawn from a population of 12,000 students. This sample size is based on Krejcie & Morgan (1970) who specified appropriate sample sizes for different populations. The random proportionate sampling technique was adopted based on the relative size of the population of schools between the public and private schools.

The research design adopted for this study is descriptive survey design. This design was appropriate because it allows for the selection of an independent sample whose views are representative of the generality of views of the entire population. The Multiple-Choice Mathematics and English Language Achievement Test (MCMEAT) and Index Learning Styles Questionnaire (ILS) were used for data collection. The researcher developed the (MCMAET) instrument for this study by drawing items from the Junior School Certificate Examination questions. The

examination is conducted by well-established examining body whose test items have well established psychometric properties. The MCMEAT consisted of 60 items and each had four options in multiple-choice format.

The ILS is a self-scoring instrument that assesses preferences on the sensing/intuitive, visual/verbal, active/reflective and sequential/global dimensions. The Index Learning Style (ILS) were adopted from Feilder and Solomon Index Learning Style (1991). The (ILS) consists of 44 statements suggesting students' preferred learning styles. Further tests of reliability was conducted using the test-retest method which yielded 0.65-0.85 for the four scales during a period of 3 weeks. This was necessary because of entirely new environment for this study as well as minor modifications in the wording of the instrument.

Results

Research Question One: *What is the learning style preference of JSS students in Gwagwala Area Council?*

Table 1: Learning Style Preference of Students

Learning Styles	Frequency	Percentage
Active/Reflective	259	69%
Sensing/Intuitive	48	13%
Sequential/Global	15	4%
Visual/Verbal	53	14%

Table 1 indicates that 259(69%) of the students had Active/Reflective learning styles. These numbers were the highest recorded among the students. This is followed by 53students (14%) with visual/verbal learning style. Forty-eight students (13%) are sensitive/intuitive learning styles. Lastly, 15 (4%)students had sequential/global learning style which is the least number of students.

Research Question Two: *How do students' learning style preference vary between male and female students?*

Table 2: Learning Style Preference of Students and their Gender

Learning styles	Gender			
	Male	Percent	Female	Percent
Active/Reflective	111	60.33	108	56.54
Sensing/Intuitive	29	15.76	31	16.23
Sequential/Global	13	7.07	20	10.47
Visual/Verbal	31	16.85	32	16.75

Table 2 indicates that 111 (60.33%) male and 108(56.54%) female students had Active/Reflective learning styles. These numbers were the highest recorded among the male and female students. This is followed by 31(16.85%) males and 32 (16.75%) female students with visual/verbal learning style. Twenty-nine (15.76%) male and thirty-one(16.23%) female students are sensitive/intuitive learning styles. Lastly, thirteen (7.07%) males and twenty(10.47%) female students had sequential/global learning style which is the least number of students with a learning style among the male and female students.

Research Question Three: *What differences exist in students' learning style preferences due to their school type?*

Table 3: Learning Style Preference of Students and School Type

Learning styles	School Type			
	Public	%	Private	%
Active/Reflective	183	70.66	39	33.62
Sensing/Intuitive	32	12.36	28	24.14
Sequential/Global	22	8.49	10	8.62
Visual/Verbal	22	8.49	39	33.62

Table 3 indicates that 183 (70.66%) public school students and 39 (33.62%) private school students had Active/Reflective learning styles. These numbers were the highest recorded among the students. This is followed by 32 (12.36%) public and 28 (24.14%) private school students with sensing/intuitive learning style. Twenty-two (8.49%) public and 39(33.62%) private school students have visual/ verbal learning styles. Lastly, twenty-two (8.49%) public and ten (8.62%) private school students had sequential/global learning style which is the least number of students.

Research Question Four: *What is the influence of learning style on academic achievement of secondary school students in FCT, Abuja?*

Table 4: Learning Styles and Academic Achievement of Students

Learning style	No.	Mean	Stand. Deviation
Active/Reflective	259	49.87	12.27
Sensing/Intuitive	48	55.04	13.18
Visual/Verbal	53	54.92	11.18
Sequential/Global	15	56.83	13.73

Table 4 indicates that students with Sequential/Global learning style had mean achievement score of 56.83 which is the highest among the students. Sensing/Intuitive students had a mean achievement score of 55.04; this is followed by

Visual/Verbal learners with mean achievement score of 54.93. It is noted that students with Active/Reflective learning styles had a mean achievement score of 49.287, which is the lowest among the students.

Null Hypothesis One: There is no significant difference between students' academic achievement due to their learning style preference.

Table 5: One-way ANOVA for Test of Difference in Students' Academic Achievement due to their Learning Style Preference

Variables	Sum of Squares	df	Mean Square	F	Sig.	Decision
Between Groups	571.851	3	190.550	1.136	.334	Accepted
Within Groups	62225.405	371	167.723			
Total	62797.056	374				

The test on Table 5 was carried out to determine whether students' academic achievement differed significantly due to the influence of their learning styles. A significant value of .334 (more than the 0.05 level of significance) shows that there is no significant difference. The hypothesis is therefore accepted. This implies that there is no significant difference in students' academic achievement due to the influence of their learning styles.

Discussion of Findings

Majority of the students,(69%) had Active/Reflective learning styles; visual/verbal and sensitive/intuitive learning styles are in the intermediate category while sequential/global learning style has the least percentage of students. Thus, variations have been observed in students' style of learning. There is in line with age old, research based belief that students vary in their learning styles and strategies. However, it has never been established to what extents. It therefore difficult to show the distribution of learning styles among populations. It has been established however, that multiple learning styles can be found among learners thus necessitating the application of multiple approaches in teaching.

On gender differences in learning styles, the results indicate that 60.33% of male and 56.54% of female students possessed the Active/Reflective learning styles. This indicates slight variations. It appears also that there is gender difference in sequential/global learning style with thirteen (7.07%) males and twenty (10.47%) female students indicating preference for this style.

On gender differences for visual/verbal and sensitive/intuitive learning styles, it can be seen that the percentages are relatively close with 16.85% and 16.75% for male and female students (visual/verbal) while for sensitive/intuitive: the percentages are 15.76% and 16.23% for male and female students respectively.

It is therefore observed that there are gender variations in learning style preferences. This is in line with the finding of numerous studies that already established gender differences in learning styles; Wherein, Lujan & DiCarlo

(2007), Choudhary, Dullo and Tandon (2011) carried out studies showing that male and female students have significantly different learning styles. With respect to learning styles where large variations have been noticed in preferences between male and female students, it might be attributable to globalization and advancement in civilization which has been blurring traditional differences among males and females.

On differences in learning styles due to school type, it was found that a wide gap exists in the number of students in each category of learning styles between public and private schools. It was found that 84% of public and 37% of private school students had Active/Reflective learning styles. A similar pattern is noticed with 9% public and 23% private school students manifesting sensing/intuitive while 4% public and 37% private school students have visual/verbal learning styles. However, difference in sequential/global learning style for public and private schools is just 4% and 3% respectively. This clearly shows that learning styles differ according to school type and might have been influenced by this factor. This finding calls for further exploration to establish possible reasons for the difference. The researchers hypothesize however, that the observed differences may be due to inherent factors such as clearly defined differences in school practices such as administrative style, curricula implementation, teaching methods, instructional resources and infrastructural facilities available to public and private schools.

On academic achievement, it can be seen from the data analysis that students with Sequential/Global learning style who are the least in number outperformed students from other categories having a mean achievement score of 60.57. This is followed by Sensing/Intuitive students who had a mean score of 55.75; this is followed by Visual/Verbal learners with mean scores of 53.33. It is noted that students with Active/Reflective learning styles had a mean of 50.20, which is the lowest among students with different learning styles. The researchers infer that learning styles influence students' academic achievement seeing that there are variations in students' academic achievement. More of the students with lower achievement scores tend to congregate around a learning style (i.e. Active/Reflective style). However the test of hypothesis showed that the observed difference is not statistically significant at 0.05 level of significance.

This re-echoes what has been established in the body of literature where research on learning style demonstrates that individuals differ in their learning style and that no single delivery system is optimal for all students (Paul, Bojanczy & Lanphear, 1994). While some studies show a positive relationship between academic achievement and the converging learning style (Rutz 2003), others show academic performance privileges for converging and assimilating learning styles (Malcom, 2009).

Conclusion and Recommendations

Conclusively, the researchers have observed multiple learning styles among student population in secondary schools in the FCT. It also established that male and female students do differ in some of their learning styles. Students however, differ in

their learning styles with respect to the type of school- Public and Private. Students' academic achievement was also influenced by their preferred learning styles although the difference was not significant.

It is therefore recommended that:

1. Teachers need to assess and understand how to reach all students by understanding how to present the information in multiple modes.
2. Teachers also need an awareness of students' learning style in order to tailor their teaching to meet the individual need of learners.
3. Instructor, whose responsibility it is to address this diversity of learning styles must be creative enough to develop appropriate learning approaches.
4. Gender-biased approaches to teaching should be re-evaluated because of the blurring line of difference between male and female learners in their learning style preferences.
5. Students' learning style preference plays a role in their academic achievement; it should be factored into any academic programme.

References

- Bruno J. (1990). *Effects of Matching and Mismatching Minority Developmental College Students' Hemispheric Preferences*. New York: Basic Books.
- Cavanaugh, D. (1982). *Hemispheric Preference*. New York: Cambridge University Press.
- Choudhary, R, Dullo, P, & Tandon, R.V. (2011). Gender differences in learning style preferences of first year medical students. *Pak J Physiol*, 1;7(2)
- Kendra V.W. Jungian Learning Style.
<http://psychology.about.com/mbiopage.html>.
- Kolb, David A. (1984). *Experiential Learning: Experience as the Source of Learning and Development*. Englewood Cliffs, N.J., Prentice-Hall, Inc.
- Kolb, D.A. Honey, A. and Munfong, D. (1992), *Experiential Learning: Experience as the Source of Learning and Development*. Englewood Cliffs, N.J: Prentice Hall.
- Lynch, T. G., Woelfl , N. N., Steele, D. J., & Hanssen, C. S. (1998). Learning style influences examination performance. *American Journal of Surgery*, 176(1): 62-66. [http://dx.doi.org/10.1016/S0002-9610\(98\)00107-X](http://dx.doi.org/10.1016/S0002-9610(98)00107-X)
- Malcom, M. (2009). *The Relationship between Learning Styles and Success in Online Learning*. Prescott Valley:Arizona.
- Milgram R, & Price G., E. (1993). *Teaching and Counseling Gifted Adolescents for Learning Style*. Charles C Thomas. Publisher. Illinois. USA.
- Newland, J. R., & Woelfl, N. N., (1992). Learning style inventory and academic performance of students in general pathology. *Bulletin of pathology education*, 17: 77-81
- Krejcie, R. V., & Morgan, D. W. (1970). Determining Sample Size for Research Activities. *Educational and Psychological Measurement*, 30, 607-610.

- Oughton, J. M., & Reed, W. M. (2000). The effect of hypermedia knowledge and learning styles on student-centered concept maps about hypermedia. *Journal of Research on Computing in Education*, 32 (3): 366– 383
- Paul, S., Bojanczyk, M., & Lanphear, J. H. (1994). Learning preferences of medical students. *Medical Education*, 28: 180-186. <http://dx.doi.org/10.1111/j.1365-2923.1994.tb02696.x>
- Rutz, E. (2003). *Learning styles and educational performance: Implications for professional development programs*. CIEC Conference proceedings, Tuson, AZ.
- Ulubabova, T. (2004). Learning styles of Russian adolescents. In R. Dunn & S.A. Griggs (Eds.), *Synthesis of the Dunn and Dunn Learning-Style Model Research: Who, Where, and so What? (pp. 159-164)*. New York: St. John's University's Centre for the Study of Learning and Teaching Styles.
- Wehrwein, E.A., Lujan, H.L., & DiCarlo, S.E. (2007). Gender differences in learningstyle preferences among undergraduate physiology students. *AdvPhysiol Educ.* 31(2):153-157.
- Zinyahs, M.Z. (2010). The relationship between learning styles and mathematics achievement of Junior Secondary School Students in Federal Capital Territory Abuja. *Unpublished M.ED Dissertation Nasarawa State University Keffi-Nigeria*.