International Journal of Advanced Educational Research
ISSN: 2455-6157
Impact Factor: RJIF 5.12
www.educationjournal.org
Volume 2; Issue 5; September 2017; Page No. 218-221

Learning styles of secondary school students and their interest in biological science

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Abstract

According to Flemings, who is a learning style expert and the author of what is likely the most widely used modality preference assessment, there are four major sensory modalities. Those four modalities are visual (V), aural (A), read-write (R), and kinesthetic (K). Students with V preferences learn best using pictures, graphs, diagrams, etc. Those with A preferences learn best by listening to and discussing material. Those with R preferences learn best with textual materials. Finally, K learners internalize information best when they are involved physically (e.g., touching and manipulating materials).The purpose of this study was to determine the relationship between learning style and interest in biological science among secondary school students in Tumakuru educational district. A sample of 379 respondents selected randomly. The study objectives were:

1. To identify the type of learning style preference among secondary school students.
2. To determine the relationship between learning style & interest in biological science of the secondary school students.
3. To study the difference between the following groups of secondary school students with reference to learning styles & interest in biological science,

- Gender
- Type of schools
- Locality and
- Socio Economic Status.

The sampling applied was stratified random. The data collection was VARK based Learning Style scale and interest in biological science scale were constructed and used by the investigator. This was used to identify the learning style preference among the students based on Visual (V), Aural (A), Read &write(R) and Kinesthetic (K) modalities. The reliability is 0.879. Findings of the study reveal that, kinesthetic learning style was found to be more prevalent than visual, aural and read & write learning styles among secondary school students. There exist positive high correlation between kinesthetic learning style and interest in biology. There is no significant difference in learning style preference among male and female student's interest in biological science. There is strong positive and statistically significant relationship between learning styles and interest for the kinesthetic learning style among male and female secondary school students.

Keywords: learning styles, secondary school students, interest in biological science

Introduction

Hunt (1979) believes that learning style: *"describes a student in terms of those educational conditions under which he is most likely to learn. Learning style describes how a student learns, not what he has learned."*

Present world is changing at a rapid rate. The generation of new information/knowledge is accelerating at an alarming rate. Psychologists, educationist, and researchers felt that individual differences among students are so extreme and unique that have a particular way to make learning. Hence there is an urgent need to examine each individual learner living in different type of environment to identify exactly how he or she is likely to learn most effectively. To, know about students (how, when, what and where- they learn best) is very much helpful to be aware of their learning process. No two persons have the same perception about himself or about world as the individual's cognitions/thinking reflect his own environment, his wants, his goals, his experiences etc. The phenomenon of the process of learning in a classroom context or in open life situation is characterized by its individual nature. The activities by teacher in the classroom are to direct and stimulate student-learning. Students learn by using/performing his/her individualized tactics, techniques and preferences in learning. It is essential for the teacher to teach according to the various learning styles of students to improve the effectiveness of teaching-learning Process. It is commonly believed that most people favour some particular method of interacting with, taking in, and processing stimuli or information. Based on this concept, the idea of individualized "learning styles" originated in the 1970's and has gained popularity in recent years. Learning styles are important because they are the education relevant expressions of the uniqueness of the individual. Individual differences are to be prized because they are the expression of the uniqueness of personalities. It has been proposed that teachers should assess the learning styles of their students and adapt their classroom methods to best fit each student's learning style. Interest is a type of feeling experience, which might be called

"worth whileness" associated with attention to an object, or course of action, an element or item in an individual's make up either congenital or acquired, because of which he tends to have this feelings of "worthwhileness" in connection with certain objects or matters relating to a particular field of knowledge. Interest is an important factor for the success of any achievement.

Biology being a science of life occupies such an important position in the secondary school curriculum. It is designed, ultimately to educate individual who may or may not pursue biology related career, but at least acquire the knowledge of how and the basic essentials for the proper functioning of the body system. Biology as a course of study is perceived to be very interesting, vast and experimental. In this present study the investigator used VRAK Learning Style scale and Interest in biological scale is constructed and used by the investigator. To identify the learning style prevailing among secondary school students and also to find out the relationship between different type of learning styles and interest in biological science among secondary school students.

Objectives of the study

1. To identify the type of learning style preference among secondary school students.
2. To determine the relationship between learning style & interest in biological science of the secondary school students.
3. To study the difference between the following groups of secondary school students with reference to learning styles & interest in biological science,

- Gender
- Type of schools
- Locality and
- Socio Economic Status.

Hypotheses of the study

1. There is no significant difference between learning styles and interest in biological science of secondary school students.
2. There is no significant difference between the following groups of secondary school students with reference to learning styles & interest in biological science,

- Gender
- Type of schools
- Locality and
- Socio Economic Status.

Methodology

The study was conducted on sample of 379 students through stratified random sampling technique from 10 schools of Tumakuru educational district in Karnataka state. After selecting the Sample, the Flemings VARK learning style was used as base and the Learning styles scale and interest in biological science scale were constructed and used by the investigator to identify the preferred learning style of students. On the basis of learning styles, students were divided in to four groups Visual (V), Aural (A), Read & write (R) and Kinaesthetic (K) learners. Interest will be measured on the basis of an individual's interest in biology, when a student has acquired a stored biological knowledge base and a positive affective feeling towards biology that leads to informed reengagement and the ability and desire to work with difficulties that might arise. Individual procedural interests, characteristics that reflect the enduring and stable aspects of a student's interests, are the focus in this tool. The correlation between learning style and interest in biological science was determined using Karl Pearson's product moment co-efficient of correlation method and t-test.

Correlation analysis

1. To determine the relationship between learning style & interest in biological science of the secondary school students.

It is observed that a positive relationship is found between interest in biological science and learning styles among secondary school students. The value is tested for its significance using 'r'. The 'r' value 0.972 is found to be significant at 0.01 level of significance. It is positively very high correlation. Therefore the null hypothesis is rejected. Hence, it is inferred that there is a significant relationship between interest in biological science and learning styles among the secondary school students. Thus it is concluded that interest in biological science and learning styles are positively related.

It is observed that a positive relationship is found between learning styles and Socio-Economic Status among IX standard students. The value is tested for its significance using 'r'. The 'r' value 0.858 is found to be significant at 0.01 level of significance. It is positively very high correlation. Therefore the null hypothesis is rejected. Hence, it is inferred that there is a significant relationship between learning styles and Socio-Economic Status of secondary school students. Thus it is concluded that learning styles and Socio-Economic Status are positively related.

2. There is no significant difference between the following groups of secondary school students with reference to learning styles & interest in biological science,

- Gender
- Type of schools
- Locality and
- Socio economic status
- Number, Mean, SD, and t-value of gender: The mean difference between the male and female is found to be 6.22. This value is tested for its significance using't'. The t-value 5.595 is found to be significant at 0.01 level of significance. Therefore the null hypothesis is rejected. Hence it is inferred that there is a significant difference in learning styles & interest in biological science of male & female secondary school students.
- Number, Mean, SD, and t-value of type of schools: The mean difference between the secondary school students studying in government and grant in aid & private school is found to be 14.78. This value is tested for its significance using 't'. The t-value 15.80 is found to be significant at 0.01 level of significance. Therefore the null hypothesis is rejected. Hence it is inferred that there is a significant difference in learning styles & interest in biological science secondary school students studying in government, grant in aid and private unaided schools.
- Number, Mean, SD, and t-value of locality: The mean

difference between the students studying in urban and rural locality is found to be 7.59. This value is tested for its significance using 't'. The t-value 7.053 is found to be significant at 0.01 level of significance. Therefore the null hypothesis is rejected. Hence it is inferred that there is a significant difference in learning styles & interest in biological science secondary school students studying in urban and rural locality.

- Number, Mean, SD, and t-value of Socio-Economic Status: The mean difference between low and high levels of Socio-Economic Status is found to be 19.46. This value is tested for its significance using 't'. The t-value 24.79 is found to be significant at 0.01 level of significance. Therefore the null hypothesis is rejected. Hence it is inferred that there is a significant difference between the secondary school students with low and high levels of Socio-Economic Status.

Summary of the Research Findings

The findings of the present study reveal that the most preferred learning style among secondary school students is Kinesthetic learning style (41.16%) followed by visual (23.49), aural (19.0%) and read & write (16.35%) learning styles. This result favours the traditional belief that students mostly learn by activity or 'Learn by Doing'. The findings of the study revealed that at secondary school level, students preferred to learn biology through kinesthetic learning style. It is not surprising that in these investigations interest in biological science scale has been more effective than other science subjects. This leads to a positive interest in learning biological science, 'Interest' usually refers to preference to engage in some types of activities. Hence the kinesthetic learning styles are the most common and a preferred form of learning among the student's learning styles in a biological science subject.

The present study results are consistent with the results of the following studies.

According to Dunn and Dunn (1978) [5], only 20-30% of school age children appear to be Auditory learners, 40% are visual learners, and 30-40% is tactile/kinesthetic or visual/tactile learners. Barbe and Milone (1981) stated that for school children the most frequent modality strengths are visual (30%) or mixed (30%), followed by auditory (25%), and then by kinesthetic (15%). Price, Dunn, and Sanders (1980) found that very young children are the most tactile/kinesthetic, that there is a gradual development of visual strengths through the elementary grades, and that only in fifth or sixth grade can most youngsters learn and retain information through the auditory sense. Carbo (1983), investigating the perceptual styles of readers, found that good readers prefer to learn through their visual and auditory senses, while poor readers have a stronger preference for tactile and kinesthetic learning.

It is observed that a positive relationship is found between interest in biological science and learning styles among secondary school students. The value is tested for its significance using 'r'. The 'r' value 0.972 is found to be significant at 0.01 level of significance. It is positively very high correlation. Therefore the null hypothesis is rejected. Hence, it is inferred that there is a significant relationship between interest in biological science and learning styles among the secondary school students. Thus it is concluded that interest in biological science and learning styles are positively related.

The present study result is consistent with the results of the following studies.

Nelliappan (1992): A study of scientific attitude, and interests among higher secondary biology students in relation to their learning environment. There was a strong relationship between the high and low total learning environment of the higher secondary biology students and their scientific attitude and scientific interests.

- **Number, Mean, SD, and t-value of gender**

It is observed that the mean difference between the male and female is found to be 6.22. This value is tested for its significance using 't'. The t-value 5.595 is found to be significant at 0.01 level of significance. Therefore the null hypothesis is rejected. Hence it is inferred that there is a significant difference in learning styles & interest in biological science of male & female secondary school students.

The present study result is consistent with the results of the following studies.

Erica A. Wehrwein, Heidi L. Lujan and Stephen E. DiCarlo, (2007) Gender differences in learning style preferences among undergraduate physiology students. Majority of male students preferred multimodal instruction, specifically, four modes (VARK), whereas a majority of female students preferred single mode instruction with a preference toward K. Thus, male and female students have significantly different learning styles. It is the responsibility of the instructor to address this diversity of learning styles and develop appropriate learning approaches.

Liang (2012) studied the effects of learning styles and perceptions on application of interactive learning guides for web based courses. The results revealed no significant statistical differences in learning styles and learning performance between the two groups. However significant main effects for both gender and learning style, and gender and the perception of utility were reported.

- **Number, Mean, SD, and t-value of type of schools**

It is observed that the mean difference between the secondary school students studying in government, grant in aid & private school is found to be 14.89. This value is tested for its significance using 't'. The t-value 15.80 is found to be significant at 0.01 level of significance. Therefore the null hypothesis is rejected. Hence it is inferred that there is a significant difference in learning styles & interest in biological science secondary school students studying in government, grant in aid and private unaided schools.

- **Number, Mean, SD, and t-value of locality**

It is observed that the mean difference between the students studying in urban and rural locality is found to be 7.59. This value is tested for its significance using 't'. The t-value 7.051 is found to be significant at 0.01 level of significance. Therefore the null hypothesis is rejected. Hence it is inferred that there is a significant difference in learning styles &

interest in biological science secondary school students studying in urban and rural locality.

The present study result is consistent with the results of the following studies

(Nasir, 2006 Abidin, *et al*, 2011) [1]. In the present study the researchers attempted to explore the learning style preferences of secondary school students and to investigate the demographic determinants (gender, place of living, religion and parents' educational level) of learning styles specifically visual, auditory, kinesthetic and tactile among these students.

Conclusion

The findings of the present study reveal that the most preferred learning style among secondary school students is Kinesthetic learning style (41.16%) followed by visual (23.49), aural (19.0%) and read & write (16.35%) learning styles. This result favours the traditional belief that students mostly learn by activity or 'Learn by Doing'. The findings of the study revealed that at secondary school level, students preferred to learn biology through kinesthetic learning style. It is not surprising that in these investigations interest in biological science scale has been more effective than other science subjects. This leads to a positive interest in learning biological science, 'Interest' usually refers to preference to engage in some types of activities. Hence the kinesthetic learning styles are the most common and a preferred form of learning among the student's learning styles in a biological science subject. Further, all the demographic variables play a significant impact on secondary school students learning styles.

Educational Implications

With the shift from an instructional to a learning paradigm, there is growing acceptance that knowledge of the way students learn is the key to educational improvement. Teachers can formulate appropriate teaching strategies and develop curriculum content by understanding students' preferred learning styles. This will lead to learners' ability to improve their own learning and perform better in the subject previously deemed difficult. Thus, findings of the present study are important in highlighting take notes as you read, exercise and move around while you are studying, build or draw what you are learning, create an action packed story about the subject you are studying and then put them together is helps to study more efficiently.

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