

RELATIONSHIP BETWEEN SCHOOL ENVIRONMENT AND ACHIEVEMENT IN BIOLOGY AT THE HIGHER SECONDARY LEVEL

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Abstract

The aim of this paper is to study the relationship between school environment and achievement in biology at the higher secondary level. For present study, the researcher investigated the relationship between school environment and achievement in biology of the students in Madurai District. The sample of the study consists of 200 higher secondary level biology students, selected by simple random technique. The investigator has used normative survey method for the study. The research tools used were 'School Environment Inventory' by Sabina Jose. S. and A. Edward William Benjamin. A. (2020) and Achievement test in Biology were adopted for the collection of data. The statistical techniques 't' test, ANOVA and Pearson Correlation are used in testing the data. Findings of the study showed that there is no significant difference in gender, type of school and type of management in relation to school environment and achievement in Biology.

Keywords: School Environment, Achievement in Biology, Higher Secondary Level

Introduction

Education is chief component for the development of any human society and nation. Education transmits knowledge, values and heritage from one generation to another through formal and non-formal learning. Education brings permanent change in one's attitude, thinking and behaviour. It cultivates positive environment and creates learning related relationships. The human being as a social animal need social institution through which a society's children are educated with basic academic knowledge, learning skills, and cultural norm. So it is significant that process of learning takes place in physical, social, cultural and psychological environment of the society. School as social system serves this purpose of moulding the future of the nation in the walls of the classroom. The quality of education depends on the quality of the environment an educant grows and develops.

School Environment

The physical, social, cultural and emotional environment of the school are holistically called as school environment. Healthy school environment is the right of the every student, teacher, parent and stakeholder of the community. It offers rich dynamic environment with enormous possibilities for constructive work, creative expression of ideas, team work and community based service opportunities to the students.

The quality of a healthy school environment comprise of

- Well-planned spacious classroom, lightning, ventilation, desks, black board, teaching aids and benches proper for the age group.
- Aesthetic surrounding of the school buildings with eco-friendly nature, playground and educative school campus for curricular and co-curricular activities.
- Student centred teaching methods and methodologies with well-equipped laboratory, library and digital educational resources.
- Trained teachers who are efficient to guide the students in teaching learning processes.
- Good administrative body that takes care of in-service training of the staff, maintains student teacher ratio, provides facilities like safe drinking water, nutritious food and health services.
- Involves the teacher, student, parents and stakeholders for the frequent assessment of the school environment.

Biology

Biology is a natural science that deals with the living world; how the world is structured, how it functions and what these functions are, how it develops, how living things came into existence, and how they react to one another and with their environment (Umar, 2011). Learning biology in the higher secondary level is a criterion to take up the professional studies like medicine, pharmacy, nursing, agriculture, forestry, biotechnology, nanotechnology, and many other areas. Since biology is a living science, teaching must reflect the stimulating nature of the subject and its surroundings. Biology students need to be facilitated to study biology lessons in a practical and learner centered method. Because the health of the nation is in the hand of the biologist who prevent and cure the illness with their inventions.

Review of Literature

School Environment and Academic Achievement of standard IX students in terms of gender, medium of instruction by Arul Lawrence. S. (2012) reveal that the urban students have better school environment than the rural students. This is due to the fact that urban students are having very much stressful environment in their day-to-day life because they are living in the mechanical and hurry burry life. So, they feel school environment is very convenient for their studies.

The influence of school environment on academic achievement of students in secondary schools by Odeh. R. C et al (2015) showed that climate, discipline and physical facilities has significant influence on academic achievement of secondary school students. According to them physical facilities form one of the potent factors that contribute to academic achievement of students in the school system. They include the school buildings, classroom, accommodation, libraries, laboratories, furniture, recreational equipment, apparatus and other instructional materials.

Impact of School Environment on Academic Achievement of Secondary School Students by Harinarayanan. S. and Pazhanivelu G. (2018) revealed that female students have a better perception of the school environment than the male students. This is because female students are by nature, calm and quiet. So they feel school environment is very convenient for their studies. Female students make use of the library and the lab much better than the male students. Girl students do not hesitate to clear the doubts in the studies than the male students.

The relationship between age, gender, verbal ability and achievement in biology among senior secondary school students by Saheed Ayodeji Adejimi et al (2020) revealed a significant difference in students' achievement in Biology based on age, gender and verbal ability. The influence of gender and school location on senior secondary school student's achievement in biology by Grace Ezechi and BibianChinyere (2018) revealed that there was significant difference in the achievement mean scores of students in rural and urban school located areas. OvansaJimoh Umar (2017) compared facilities and students performance in biology in urban and rural schools. The outcome of the study indicated that most rural schools lack adequate facilities for teaching and learning of biology and there by brings about disparity in the academic performance of students.

Significance of the Study

We live in a highly competitive world where everyone desires to achieve extremely well in their performance. Students of today forced to attain their academic achievement in Biology to groom their future as doctors, biologist, scientist, agriculturist etc... Thus the education system provides ample opportunities in the school, creating an environment to reach students' educational goals. School environment is an ideal place with all its physic-social setting plays an integral role in moulding students' character. The teachers' role in the student's achievement is dynamic and irreplaceable. Teachers felicitate the learning of the students with the student centered methods in biology making use of the facilities offered in the school environment. Since the environment in the school influences the achievement in Biology of the students, the investigator selected the topic for this study as '**Relationship between School Environment and Achievement in Biology at the Higher Secondary Level**'.

Objectives of the Study

1. To find out whether there is any significant difference between Male and Female at the higher secondary level in their School Environment.
2. To find out whether there is any significant difference between Private and Government at the higher secondary level in their School Environment.
3. To find out whether there is any significant difference among Boys, Girls and Co-Education at the higher secondary level in their School Environment.
4. To find out whether there is any significant difference between Male and Female at the higher secondary level in their Achievement in Biology.
5. To find out whether there is any significant difference between Private and Government at the higher secondary level in their Achievement in Biology.
6. To find out whether there is any significant difference among Boys, Girls and Co-Education at the higher secondary level in their Achievement in Biology.
7. To find out the relationship between school environment and achievement in biology at the higher secondary level.

Hypotheses of the Study

1. There is no significant difference between Male and Female at the higher secondary level in School Environment.
2. There is no significant difference between Private and Government at the higher secondary level in School Environment.

3. There is no significant difference among Boys, Girls and Co-Education at the higher secondary level in School Environment.
4. There is no significant difference between Male and Female at the higher secondary level in Achievement in Biology.
5. There is no significant difference between Private and Government at the higher secondary level in Achievement in Biology.
6. There is no significant difference among Boys, Girls and Co-Education at the higher secondary level in Achievement in Biology.
7. There is no relationship between school environment and achievement in biology at the higher secondary level.

Methodology

Sample

The sample of 200 students from private school (50boys, 50girls) and Government School (50 boys 50girls) were selected through simple random sampling technique from three Higher Secondary Schools in Madurai District.

Tools for data collection

1. School Environment Inventory by S. Sabina Jose and A. Edward William Benjamin. (2020) adopted for the data collection. The tool has 42 statements on a five point rating scale based on Likert's type. The scoring procedure of the tool's options are Strongly Disagree with score 1, Disagree score 2, Undecided score 3, Agree score 4, Strongly Agree score 5. The minimum score for the tool is 42 and maximum score of the tool is 210. The intrinsic validity of school environment inventory is 0.83.
2. Biology Achievement test consist of 50 objective type questions taken from first 2 units of 11th standard Tamil Nadu Government text book.

Hypothesis testing and interpretation of Data

Hypothesis: 1

There is no significant difference between Male and Female at the higher secondary level in School Environment.

Table – 1: Difference in the School Environment at the HigherSecondary level with Respect to Gender

Gender		N	Mean	Std. Deviation	Std. Error Mean	t value	Sig. Level
Healthy School Environment	Male	100	196.80	6.442	.644	.818	NS
	Female	100	196.59	6.417	.642		

It is inferred from the above table that the overall mean score of male students is 196.80 and female students is 196.59. This shows that the male students have higher healthy school environment than female students. The calculated 't' value of school environment is 0.818 which is greater than 0.05 levels of significance. This shows that there is no significant difference between male and female higher secondary students in their school environment. **Hence the hypothesis is accepted.**

Hypothesis: 2

There is no significant difference between Private and Government at the higher secondary level in School Environment.

Table – 2: Difference in the School Environment at the HigherSecondary level with Respect to Type of Management

Type of Management		N	Mean	Std. Deviation	Std. Error Mean	t value	Sig. Level
Healthy School Environment	Private	100	196.70	6.444	.644	.991	NS
	Government	100	196.69	6.416	.642		

It is inferred from the above table that the overall mean score of Private students is 196.70 and Government students is 196.69. This shows that the Private students have higher healthy school environment than Government students. The calculated 't' value of school environment is 0.991 which is greater than 0.05 levels of significance. This shows that there is no significant difference between Private and Government higher secondary students in their school environment. **Hence the hypothesis is accepted.**

Hypothesis: 3

There is no significant difference among Boys, Girls and Co-Education at the higher secondary level in School Environment.

Table – 3: Difference in the School Environment at the HigherSecondary level with Respect to Type of School

Type of School	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Boys	60	197.10	6.498	.839	195.42	198.78
Girls	70	196.74	6.455	.772	195.20	198.28
Co-Education	70	196.30	6.369	.761	194.78	197.82
Total	200	196.70	6.414	.454	195.80	197.59

It is inferred from the above table that the overall mean score of Boys students is 197.10, Girls students is 196.74, Co-Education students is 196.30. This shows that Boys students have highest level of healthy school environment and Co-Education students have lowest level of school environment.

ANOVA

Type of School	Sum of Squares	df	Mean Square	F	Sig. Value	Sig. Level
Between Groups	20.924	2	10.462	.252	.777	NS
Within Groups	8165.471	197	41.449			
Total	8186.395	199				

From the above table that the calculated significant value of school environment is 0.777 which is greater than 0.05 levels of significance. This shows that there is no significant difference among Boys, Girls and Co-Education higher secondary students in their School Environment. **Hence the hypothesis is accepted.**

Hypothesis: 4

There is no significant difference between Male and Female at the higher secondary level in Achievement in Biology.

Table – 4: Difference in the Achievement in Biology at the HigherSecondary level with Respect to Gender

Gender	N	Mean	Std. Deviation	Std. Error Mean	t value	Sig. Level
Academic Achievement in Biology	Male	100	45.11	3.892	.839	NS
	Female	100	45.00	3.774		

It is inferred from the above table that the overall mean score of male students is 45.11 and female students is 45.00. This shows that the male students have higher academic achievement in biology than female students. The calculated 't' value of achievement in biology is 0.839 which is greater than 0.05 levels of significance. This shows that there is no significant difference between male and female higher secondary students in their achievement in biology. **Hence the hypothesis is accepted.**

Hypothesis: 5

There is no significant difference between Private and Government at the higher secondary level in Achievement in Biology.

Table – 5: Difference in the Achievement in Biology at the HigherSecondary level with Respect to Type of Management

Type of Management	N	Mean	Std. Deviation	Std. Error Mean	t value	Sig. Level
Academic Achievement in Biology	Private	100	45.00	3.900	.839	NS
	Government	100	45.11	3.766		

It is inferred from the above table that the overall mean score of Private students is 45.00 and Government students is 45.11. This shows that the Government students have higher academic achievement in

biology than Private students. The calculated 't' value of achievement in biology is 0.839 which is greater than 0.05 levels of significance. This shows that there is no significant difference between Private and Government higher secondary students in their achievement in biology. **Hence the hypothesis is accepted.**

Hypothesis: 6

There is no significant difference among Boys, Girls and Co-Education at the higher secondary level in Achievement in Biology.

Table – 6: Difference in the Achievement in Biology at the Higher Secondary level with Respect to Type of School

Type of School	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Boys	60	45.10	3.939	.509	44.08	46.12
Girls	70	44.90	3.868	.462	43.98	45.82
Co-Education	70	45.17	3.730	.446	44.28	46.06
Total	200	45.06	3.824	.270	44.52	45.59

It is inferred from the above table that the overall mean score of Boys students is 45.10, Girls students is 44.90, Co-Education students is 45.17. This shows that Co-Education students have highest level of achievement in biology and Girls students have lowest level of academic achievement in biology.

ANOVA

Type of School	Sum of Squares	df	Mean Square	F	Sig. Value	Sig. Level
Between Groups	2.752	2	1.376	.093	.911	NS
Within Groups	2907.643	197	14.760			
Total	2910.395	199				

From the above table that the calculated significant value of academic achievement in biology is 0.911 which is greater than 0.05 levels of significance. This shows that there is no significant difference among Boys, Girls and Co-Education higher secondary students in their achievement in biology. **Hence the hypothesis is accepted.**

Hypothesis: 7

There is no relationship between school environment and achievement in biology at the higher secondary level.

Significant relationship between Health School Environment and Achievement in Biology at Higher Secondary Level

Correlations			
		School Environment	Achievement in Biology
School Environment	Pearson Correlation	1	-.045
	Sig. (2-tailed)		.527
	N	200	200
Academic Achievement in Biology	Pearson Correlation	-.045	1
	Sig. (2-tailed)	.527	
	N	200	200

From above the table, it reveals that there is **negative correlation** between Health School Environment and Academic Achievement in Biology which shows the correlation value **-.045**. The result shows that the significant level is found to be 0.527 which is significant at 0.05 levels.

Findings

- There is no significant difference between male and female at the higher secondary level in school environment. Hence, it reveals that both male and female students are provided with the school environment to fulfil their significant learning requirements.
- There is no significant difference between Private and Government at the higher secondary level in school environment. This is because, today the school environment of Government and private schools are good and well maintained with all its physical and learning environment.
- There is no significant difference among Boys, Girls and Co-Education at the higher secondary level in School Environment. Boys' students have highest level of school environment and Co-Education students have lowest level of school environment.
- There is no significant difference between male and female at the higher secondary level in achievement in biology. It shows that both male and female students are precise in their effort and performance in achievement in biology.
- There is no significant difference between Private and Government at the higher secondary level in their achievement in biology. Hence, it reveals that students are given opportunities and coached to gain achievement in biology whether the management be government or private.
- There is no significant difference among Boys, Girls and Co-Education at the higher secondary level in achievement in biology. Co-Education students have highest level of achievement in biology and Girls students have lowest level of achievement in biology.
- There is negative correlation between School Environment and Achievement in Biology which shows the correlation value -0.045 .

Discussion

- The study physical facilities form one of the potent factors that contribute to academic achievement of students in the school system by Saheed Ayodeji Adejimi et al (2020) supports the present study that the school buildings, classroom, accommodation, libraries, laboratories, furniture, recreational equipment, apparatus and other instructional materials are important for healthy school environment.
- Impact of School Environment on Academic Achievement of Secondary School Students by Harinarayanan. S. and Pazhanivelu G. (2018) proves that school environment is very convenient for the studies and their academic achievement.
- The influence of school environment on academic achievement of students in secondary schools by Odeh. R. C et al (2015) support the present study that climate, discipline and physical facilities has significant influence on academic achievement of secondary school students.
- The relationship between age, gender, verbal ability and achievement in biology among senior secondary school students by Saheed Ayodeji Adejimi et al (2020) shows a significant difference in students' achievement in Biology based on age, gender and verbal ability.

Recommendations

- The school management and stake holders of the school need to take to provide safe school buildings, classroom, accommodation, libraries, laboratories, furniture, recreational equipment, apparatus and other instructional materials to influence achievement.
- The teachers should felicitate in the students to develop intrinsic factors like interest, motivation and drive for future goals for the achievement in biology.
- The teachers must be given regular in service training to use the laboratory effectively making use of educative school environment for biology related activities and projects.

Delimitation of the Study

- The sample of the present study is limited to the biology students studying in standard XI only.
- The sample size is limited to 200 of students studying in Government and private schools of Madurai district only.

Conclusion

The school environment plays a significant role in the achievement of the students. It provides them opportunities, possibilities and resources needed for the students. In the present study, it is found that boys' students have highest level of school environment and Co-Education students have lowest level of school environment. Co-Education students have highest level of achievement in biology and Girls students have lowest level of achievement in biology. This study shows a negative correlation between the school environment and academic achievement. Hence to achieve a high level, efforts must be taken to strengthen the school environment.

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