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# Chapter 5

## Findings, Conclusions and Suggestions

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The conclusion in itself would be no significance unless it can be point out ways and means of improving biological science concepts understanding in science teaching. This objective is achieved by the suggestions which are subsequently listed for both for real life application in teaching environment and further studies. The suggestion also incorporate the limitation of the present study which can serve as new ground for further work in this area and other related field. It is hoped that this would make the limitation of the present study not an obstacle in science teaching but are fertile seeding ground for development of new ideas and methods.

#### **5.1 Brief Summary of the study:-**

As a discipline Biology is very important. Because it directly deals with life and life processes. It explains the changes in the human body and basic concepts of living. In the teaching learning process it is always important to know whether all the students are learning at their full potential or not. In the context of biology it became more important. So this study was aiming to find out students' understanding related to biological concepts. All the available journals, periodicals and books related to this topic were referred for getting adequate background for the study.

Gender, Language, Residential Background and Student level were independent variables and Understanding of biological science concepts was a dependent variable for the study.

Curriculum of 12<sup>th</sup> class was analyzed and four basic topics were identified for the achievement test. Test was constructed by investigator and was administered in groups of different schools. Design for this study was explanatory design, in this design qualitative data helps explain or build upon initial quantitative results.

Achievement test was administered and the data obtained in the study were statistically analyzed and scientifically interpreted.

This study shows that students of different gender, language and locality do not understand biology in a similar way. There is a significant difference in their understanding.

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## **5.2 Findings of the study from null hypotheses:-**

Findings of the study along with the underlying relevant hypothesis are mentioned below:

**Null Hypothesis 1(H<sub>01</sub>):** There is no significant difference in achievement of biology between girls and boys

**Finding:** Null hypothesis was rejected (at 0.05 level of significance). Significant difference has been found between boys and girls in understanding of biological science concepts.

**Null Hypothesis 2 (H<sub>02</sub>):** There is no significant difference in achievement of biology between urban and rural students

**Finding:** Null hypothesis was rejected. (at 0.05 level of significance). Significant difference has been found between urban and rural students in understanding of biological science concepts.

**Null Hypothesis 3 (H<sub>03</sub>):** There is no significant difference in achievement of biology between Hindi and English medium students

**Finding:** Null hypothesis was rejected. (at 0.05 level of significance) Significant difference has been found between Hindi and English medium students in understanding of biological science concepts.

**Directional hypothesis 1 (H<sub>1</sub>):** Undergraduate students have more understanding of biological concepts than intermediate college students

**Finding:** Directional hypothesis was accepted. (At 0.05 level of significance) Significant difference has been found between urban and rural students in understanding of biological science concepts

## **5.3 Findings Based on Frequency Distribution In Terms of Percentage:**

**Finding 1:** A reference to table 4.16 shows that 36.66 % students scored more than 60 % and 42 percent students got marks between 41 to 60 percentages.

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Maximum numbers of students are in average category for conceptual understanding of biological science.

**Finding 2:** A reference to table 4.17 shows that 52.72 % girls and 27.36 % boys have scored more than average. Girls have more conceptual understanding of biological science in comparison of boys. But here interesting fact is that 9.47 % boys have excellent scores while only 3.63 % girls having it. There is a gap some boys are excellent but maximum are average.

**Finding 3:** A reference to table 4.18 shows that 36.35 % rural and 36.97 % urban students have scored more than average. But after looking in average and excellent category, it is found that urban students have more conceptual understanding of biological science in comparison of rural students.

**Finding 4:** A reference to table 4.19 shows that 38.88 % Hindi medium and 24.99 % English medium students have scored more than average. It is found that Hindi medium students have more conceptual understanding of biological science in comparison of English medium students.

**Finding 5:** A reference to table 4.20 shows that in selected areas of the biology. Students have maximum concepts understanding in cell biology. There is worst condition in conceptual understanding related to human genetics.

#### **5.4 Limitations of the study**

Limitations of the study can be categorized as follows:

##### **1. Related to the making of biological science concept understanding test**

While making test only 4 dimensions of biological science concepts understanding have been taken as representative concepts. Understanding of biological science concept is a wider field and it may have more dimensions which were not discussed in the tool used in the study

2. Some more Imperial evidence of the validity of the test should have been found out. Construct validation of the test should be done precisely.
3. Test should be reliable and it should be checked on multiple samples but due to lacuna of time it was not done.



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4. Some very important other variables like motivation, teaching styles and attitude towards biological science, parents education, cognitive ability etc. were not considered in the study
  5. Facilities in the school also can be affecting the biological science concept understanding. These areas was also excluded from the study

### **5.5 Suggestions for the further studies:**

1. Standardization of the tool used in this study can be done on the larger samples.
2. A Study of other correlates of understanding of chemical science and physical science concept in relation to the independent variables can be carried out by modifying the model of the study.
3. A combined study of all dimensions of understanding of biological science concepts in different types of courses which are being followed in different institutions can be done.
4. A Study of relationship between understandings of biological science concepts and also other important variables can be done

### **5.6 Educational implications of the study**

This study shows that students of different gender, language and locality do not understand biology in a similar way. There is a significant difference in their understanding. So teachers have to use different techniques by considering their individual differences in the mind.

Teachers also can find out whether these variations are present in understanding of other subjects or not and also can apply different teaching techniques instead of what they are using.

This study also shows that students do not understand all the topics in a similar way; they have different achievement scores for different topics of biology. So it is necessary to change teaching techniques so that they will understand all topics of biology in a similar way. Maybe teachers are using the same teaching for all the topics so they can use different techniques for different topics.

Teachers also can find out the causes of these variations in the conceptual understanding of biology subject, this study provide ground for various future action researches.

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## **5.7 conclusions:**

Because of the extended scope of the study spread over numerous factors in different population groups and aggregate of conclusions has emerged from the study.

Firstly then study shows that gender and medium of instruction are limiting factors in understanding of biological science concepts. Also a difference in understanding of biological science concept is seen between rural and urban students.

Conclusions indicate that while the development of Intelligence and scholastic concept understanding are differentiable on the basis of locale, gender and medium of instruction.

It is also concluded the maximum number of students are scoring between 40 to 60 percentages in biological science concepts understanding. The topics like cell and genetics have good scores but understanding related to their practical aspect e.g. human genetics is in worst condition.