

# A Study on Reasoning Ability of Undergraduate Level Students of Sonitpur District On The Basis Of Gender and Stream

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## ABSTRACT

Human beings can think on any given content or subject with different perspectives. The prime cause of adopting such a method of thinking is the existence of intelligence or reasoning ability in human body. Reasoning skills are recognised as the key abilities for human being to discover, explore as well as use the knowledge in a wise manner. In the process of human civilization, such skills do play an important factor. The significance of reasoning ability has been of great concern in educational settings and in the world of work. Reasoning plays an important role in one's adjustment to one's environment. The present research is proposed to measure the reasoning abilities of the undergraduate level students on the basis of their streams and gender in Sonitpur district, Assam. The standardized tool used by the researcher is called 'Shailaja Bhagwat Reasoning Ability Test'. The questionnaire used for the purpose of data collection has been divided into two sections which consisted of 30 items. For selecting the sample, the researcher employed stratified random sampling technique. The sample in the study comprised of 120 students from a college out of which 75 were boys and 45 girls. Descriptive statistics has been used and t-test calculated for the purpose of data analysis. The study revealed that there existed no significant difference in the reasoning ability between arts and science students. It was also found that there existed no significant difference in the reasoning ability between the male and female students at undergraduate level.

## Keywords

Reasoning Ability, Undergraduate students, Gender, Streams of study.

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## Introduction

Education is an important element for the success of an individual in his or her life. Education has been considered as a potential instrument of national development. A modern society cannot achieve its aim of economic growth, technical development and cultural advancement without providing education to its citizen. Education, in general, helps in improving the mental, physical and social health of the respondents. Human beings differ from all the other living things as they have been blessed with unique ability by the nature in this whole living organism. This unique mental ability is his reasoning power. Reasoning skills are recognised as the key abilities for human being to discover, explore as well as use the knowledge in a wise manner. Reasoning skills are necessary in our day-to-day life as we use them to make choices among possible options, to distinguish between positive and negative situations, to decide the ways of approaching towards a problem, so as to resolve it.

There are plenty of researches in the field of

measurement and evaluation. But reasoning ability has been less attended and measured. In other words, there is dearth of a good reasoning ability test. Therefore, the present research aims at studying the reasoning ability of undergraduate students with the help of a standardized reasoning ability test. So in this study, the researcher will try to highlight some key factors such as reasoning ability, gender and streams which influences the students at undergraduate level. In this study, the investigator will see the influence of reasoning ability on undergraduate students based on their gender and streams belonging to Sonitpur district.

## Literature Review

Nicholls, J.G. & Miller, A.T. (1984), conducted a study entitled as "Reasoning Ability of Self and Others: A Developmental Study". This study aimed at focussing on children's reasoning ability. The investigators compared children's reasoning about the relative ability of themselves with that of others. The sample consisted of 30 girls and 30 boys from each of 2<sup>nd</sup>, 5<sup>th</sup> and 8<sup>th</sup> grades from schools in Frankfort, Indiana were tested. From the analysis of responses to the whole interview, it

was revealed similar developmental levels of reasoning about two others and about the self and a comparison other. However, conditions involving the self-produced more specific judgements of equal ability than did conditions involving two others. When children themselves had been induced to apply lower effort more denial of low effort was produced by self-conditions than when a comparison other applied lower effort. Ability judgements were less mature at the beginning than at the end of the interview. The findings indicated that judgement methods may be more sensitive to situational induced motivational influences than is the Piagetian method.

**Chhikara, M.S. (1985)**, conducted a study entitled as “An Investigation into the Relationship of Reasoning Abilities with Achievement of concepts in Life Science”. The study was carried out with an aim of investigating the relationship between Reasoning Abilities and Achievement of concepts in life science. The tools used in the study were Battery of Concept Achievement Tests and a Battery of Reasoning Ability Tests developed by Girish Bala. The test was administered to 370 students for try-out. Nearly 200 students from 4 Government Boys Senior Secondary Schools of South Delhi constituted the sample. The findings showed that a definite positive relationship between conceptual

**Patoliya, H.C. (2017)**, conducted a study entitled as “Construction and Standardization of Reasoning Ability Test for Undergraduates”. The study aimed at constructing a standardised test on The objectives of the study were: to construct and standardize Reasoning Ability Test to measure reasoning ability among undergraduates and to study the reasoning ability of graduates in reference to their gender and discipline. The sample of the study included more than 3000 students from 4 districts in Gujarat and the technique used was stratified random cluster sampling technique. The data was analysed by different statistical method- descriptive and inferential statistics. The research design used in the study was descriptive type. The findings of the study throw light on the fact that there existed significant differences between different streams

achievement in life sciences and reasoning ability was observed. Also, the possibility to predict conceptual achievement in life sciences on the basis of the reasoning ability test was supported to a large extent by the results of regression analysis.

**Kuhn, J.T. & Holing, H. (2009)**, conducted a study titled as “Gender, Reasoning Ability and Scholastic Achievement – A Multilevel mediation analysis”. The present study investigated gender differences in scholastic achievement as arbitrated by reasoning ability in a large sample with a clustered data structure from an educational context. The findings of this study brings into light that girls outperformed boys in languages, whereas boys excelled in sciences and reasoning. A small indirect effect of gender on school grades arbitrated by reasoning ability was indicated by multilevel analyses. Furthermore, gender differences in science were largely explained by reasoning ability, but not by factors such as gender ratio in the classroom or mental speed. The predictive power of reasoning ability for languages was found to be larger in classrooms with higher mean reasoning ability. Furthermore, gender difference in languages was observed to be varied significantly across classrooms. Reasoning ability seems to be essential for predicting scholastic achievement in sciences, whereas gender-related attributes seemed to affect languages more.

based on their Reasoning Ability Tests. It was also found that there existed significant differences among reasoning ability of the students on the basis of their gender.

**Novianawati, N. & Nahadi, N. (2019)** conducted a study entitled as “An Investigation of Reasoning Ability at the secondary level students”. The study aimed at investigating students’ reasoning ability of junior high school level. This study is quantitative descriptive research. The sample of the study included 178 students of 8 Junior High Schools in Bandung, Indonesia. The sample was chosen by using Stratified Random Sampling technique. The instrument used in this study was a Logical Thinking Test which consisted of five reasoning aspects and every aspect consisted of two items. The result indicated that only several students who have formal reasoning ability possessed probabilistic and correlational

reasoning. The findings also revealed that many students also lacked probabilistic and correlational reasoning.

### Significance

In recent times, the importance of reasoning ability, aptitude, academic achievement has been increasing all over the world. In India also people are showing their concern towards it. Some of the major reasons why this study is important are because of the importance of reasoning ability, that is, the factors affecting reasoning ability of the students are being studied. Secondly, to form educational plans and policies, as in, for educational development, suitable plans and policies are very important. So, this study will help educational planners as well as government to plan in such a way which will increase reasoning of the students.

To decrease gender differences in education as gender disparity is rampant in Indian society. So, results of this study will help in knowing the educational condition of both male and female. Accordingly, steps can be taken to improve their existing condition.

### Statement of the problem

Considering the significance of study, the statement of the problem is “A Study on Reasoning Ability of Undergraduate level students of Sonitpur district on the basis of gender and stream.”

### Area of the study

For the present study, the area selected by the researcher is Sonitpur district which is located in the state of Assam, India.

### Objectives

Following are the objectives of the study -

1. To compare the reasoning ability of Undergraduate level students on the basis of stream (arts and science) of Sonitpur district.

2. To compare the reasoning ability of Undergraduate level students on the basis of gender (boys and girls) of Sonitpur district.

3. To compare the reasoning ability between UG level boys (arts and science) in Sonitpur district.

4. To compare the reasoning ability between UG level girls (arts and science) in Sonitpur district.

### Hypothesis

Following are the hypothesis of the study -

1. There is no significant difference in the reasoning ability between arts and science students at Undergraduate level.

2. There is no significant difference in the reasoning ability between boys and girls at Undergraduate level.

3. There is no significant difference in the reasoning ability between UG level boys (arts and science) in Sonitpur district.

4. There is no any significant difference between UG level girls (arts and science) in Sonitpur district.

### Delimitation of the study

The delimitations of the study are as follows -

1. The study is only limited to Sonitpur district.

2. Only one college of Sonitpur district has been included in the study.

3. The present research includes gender and streams of study as sub-variables. Therefore, these variables will only be studied in reference to the measurement of reasoning ability.

### Conceptualisation

The operational definitions of the term used are -

Reasoning Ability: In the present study, reasoning ability is understood in terms of logical thinking ability of a person in general situation. Here, the

person must have adequate knowledge about the problem as well as there must be no emotional biasness, if and when presented with a particular situation. Basically, it is a process in which an individual thinks and acts rationally when given a particular situation. It is the skill of mind in understanding things and drawing conclusions in a logical manner.

**Undergraduate Students:** In the present context of the study, an undergraduate student is one who has passed his or her high school and has taken admission to college, but hasn't graduated yet. They are basically college going students within the age group of 18-22 years.

## Methodology

**Method of study:** Descriptive survey method has been used in the study.

**Sample of the study:** For this study, a sample of 120 students consisting of 75 males and 45 females were selected from Darrang College of Sonitpur district of the state of Assam in India.

**Sampling Technique:** The samples were randomly selected from the students studying in

undergraduate course of various disciplines. For selecting the sample, the researcher employed stratified random sampling technique.

**Tool used:** A questionnaire was used for this descriptive survey research. The Shailaja Bhagwat Reasoning Ability Test, a standardized test, was used for the reasoning test.

**Procedure of data collection:** The questionnaires were distributed among the selected sample after receiving permission from the Head of the Institution. The data collected were then computed and interpreted.

## Data Analysis and Interpretation

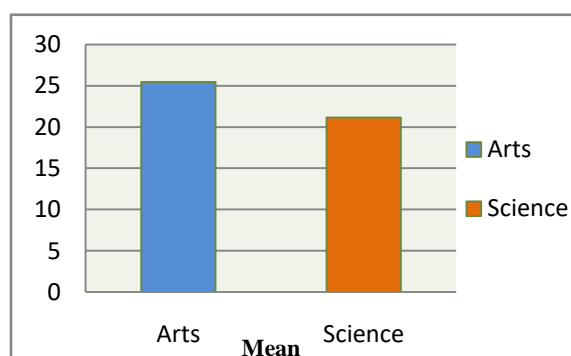
### ANALYSIS AND INTERPRETATION OF OBJECTIVE NO-I

**Objective 1:** To compare the reasoning ability of Undergraduate level students on the basis of stream (arts and science) of Sonitpur district.

**H<sub>01</sub>** There is no significant difference in reasoning ability between arts and science students at Undergraduate level.

**Table 1: Stream wise t-test values of the students.**

Variable	Groups compared	Number	Mean	Median	Mode	SE	SD	Df	t-value
Reasoning Ability	Arts	60	25.45	26.5	29	0.47	3.68	118	4.61
	Science	60	21.13	21	20	0.76	5.90		



**Figure 1:**

**Representation of stream-wise mean**

**scores of students.**

**Interpretation:** From table no. 1, it is observed that the total numbers of students are 120 out of which 60 students are from arts and the other 60 are from science. Mean, median and mode scores of the students of arts are 25.45, 26.5 and 29 respectively whereas that of science are 21.13, 21 and 20 respectively. The Standard Error of the students of arts is 0.47 and that of science is 0.76. Standard deviation of the students of arts is 3.68 and science is 5.90. The t-value is 4.61 and  $df = 118$  which is not significant at 0.05 level of significance. Hence the null hypothesis stating that there is no significant difference between arts and science students at Undergraduate level is not rejected. Therefore, there is no significant

difference in reasoning ability between arts and science students. Hence, the reasoning ability of arts and science students are same extent.

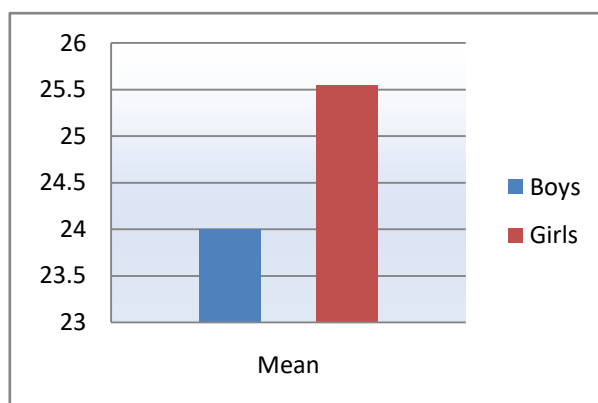
**ANALYSIS AND INTERPRETATION OF OBJECTIVE NO-2**

**Objective 2:** To compare the reasoning ability of undergraduate level students on the basis of gender (boys and girls) of Sonitpur district.

**Ho2:** There is no significant difference between boys and girls students of undergraduate level.

**Table 2: Gender wise t-test values of the students.**

Variable	Groups compared	Number	Mean	Median	Mode	SE	SD	Df	t-value
Reasoning Ability	Boys	75	24	25	29	0.65	5.69	114	0.845
	Girls	45	25.55	27	29	0.60	4.05		

**Figure 2: Representation of students.****gender-wise mean scores of**

**Interpretation:** From table no.2, it is observed that the total numbers of students are 120 among them 75 students are boys and the other 45 are girls. Mean, median and mode scores of boys are 24, 25 and 29 respectively and that of girls are 25.55, 27 and 29 respectively. The Standard Error of the boys is 0.65 and that of girls is 0.60. Standard deviation of the boys is 5.65 and girls is 4.05. The t-value is 0.845 and  $df = 114$  which is

not significant at 0.05 level of significance. Hence the null hypothesis stating that there is no significant difference between the reasoning ability of boys and girls at Undergraduate level is not rejected. Therefore, there is no significant difference in reasoning ability between boys and girls. Hence, the reasoning ability of boys and girls students are of same extent.



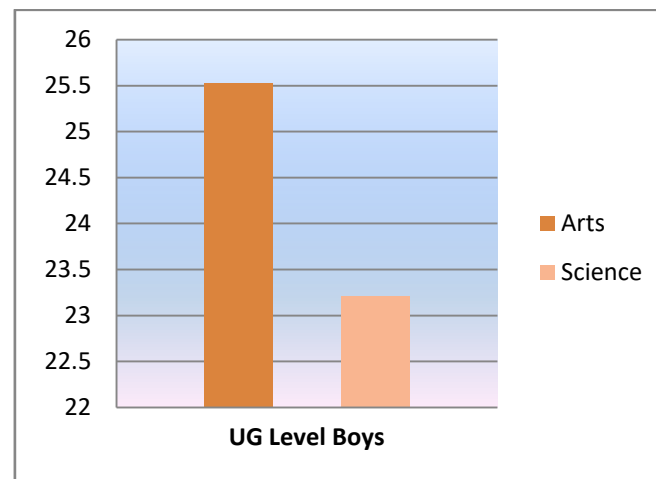
## ANALYSIS AND INTERPRETATION OF OBJECTIVE NO-3

**Objective 3:** To compare the reasoning ability between Undergraduate level boys (arts and science) in Sonitpur district.

**Ho3:** There is no significant difference between reasoning ability of Undergraduate level boys (arts and science) in Sonitpur district.

**Table 3: T-test values of Undergraduate level Boys (arts and science).**

Variable	Groups compared	Number	Mean	Median	Mode	SE	SD	Df	t-value
Reasoning Ability	Arts	47	25.53	26	29	0.511	3.50	38	0.067
	Science	28	23.21	23.5	29	1.119	5.92		



**Figure 3: Representation of stream-wise mean scores of UG level boys**

**Interpretation:** From table no.3, it is observed that the total numbers of UG level boys are 75, among them 47 are from arts stream and the other 28 are from science stream. Mean, median and mode scores of boys from arts stream are 25.53, 26 and 29 respectively and that of science are 23.21, 23.5 and 29 respectively. The Standard Error of the boys from arts is 0.511 and science is 1.119. Standard deviation of the boys from arts is 3.50 and science is 5.92. The t-value is 0.067 and df = 38 which is not significant at 0.05 level of significance. Hence the null hypothesis stating that there is no significant difference between the reasoning ability of UG Level Boys (arts and

science) at Undergraduate level is not rejected. Therefore, there is no significant difference between the reasoning ability of UG level boys (arts and science) at Undergraduate level. Hence, the reasoning ability of UG level boys (arts and science) are of same extent.

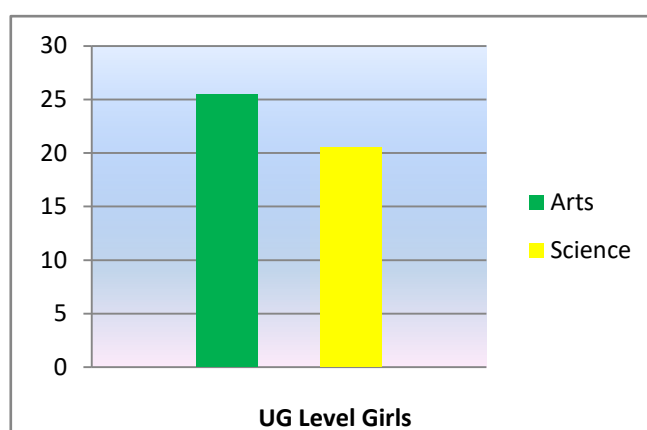
## ANALYSIS AND INTERPRETATION OF OBJECTIVE NO-4

**Objective 4:** To compare the reasoning ability between Undergraduate level Girls (arts and science) in Sonitpur district.

**Ho4:** There is no significant difference between reasoning ability of Undergraduate level Girls (arts and science) in Sonitpur district.

**Table 4: T-test values of UG level girls (arts and science).**

Variable	Groups compared	Number	Mean	Median	Mode	SE	SD	Df	t-value
Reasoning Ability	Arts	32	25.48	26	21	0.60	3.36	14	0.038
	Science	13	20.53	21	29	2.08	7.51		



**Figure 4: Representation of stream-wise mean scores of UG level girls**

**Interpretation:** From table no.4, it is observed that the total numbers of Undergraduate level girls are 45, among them 32 are from arts stream and the other 13 are from science. Mean, median and mode scores of girls from arts stream is 25.48, 26 and 21 respectively whereas that of science is 20.53, 21 and 29 respectively. The Standard Error of the girls from arts is 0.60 and science is 2.08. Standard deviation of the girls from arts is 3.36 and science is 7.51. The t-value is 0.038 and df = 14 which is significant at 0.05 level of significance. Hence, the null hypothesis stating that there is no significant difference between the reasoning ability of UG Level Girls (arts and science) at Undergraduate level is rejected. Therefore, there is a significant difference between the reasoning ability of UG level girls (arts and science) at Undergraduate level. Hence, the reasoning ability of UG level girls (arts and science) are not of same extent.

## Results

From data analysis and interpretation, it is evident that:

1. There is no significant difference in reasoning ability between arts and science students at Undergraduate level and the reasoning ability of arts and science students are found of same extent.
2. There is no significant difference in reasoning ability between boys and girls at Undergraduate level and the reasoning ability of boys and girls are found of same extent.
3. There is no significant difference in reasoning ability between Undergraduate level boys (arts and science) in Sonitpur district and the reasoning ability of Undergraduate level boys of arts and science stream are found to be of same extent.

4. There is a significant difference in reasoning ability between Undergraduate level girls (arts and science) in Sonitpur district and the reasoning ability of Undergraduate level girls of arts and science stream are not found to be of same extent.

5. So far as reasoning ability is concerned, students are encouraged to practice their reasoning skills in many settings, from their other classes to their practicum sites, student organizations, residence hall councils and other areas, to gain practice and confidence applying their thinking skills.

### Discussions

Discussion of results in the context of previous research studies done are as follows:

#### DISCUSSION-1

Comparison between the mean scores of reasoning ability of arts and science students at Undergraduate level.

T-test value for the comparison between the mean scores of reasoning ability of arts and science students at Undergraduate level is 4.61, which is not significant at 0.05 level of significance. Therefore, it accepts the null hypothesis that there is no significant difference in reasoning ability between the arts and science at undergraduate level. Hence, the reasoning ability of arts and science are of same extent. In a study conducted by **Banker (1981)**, it was found that there existed a significant difference between stream and sex in reasoning. But in contrast to this, the present study suggests that there is no significant difference in reasoning ability between the arts and science at undergraduate level. There are some of the reasons of this result. These are- students may prepare well before the reasoning test, students may have clear concept of education and the items in the test may be simple for them.

#### DISCUSSION-2

Comparison between the mean scores of reasoning ability of boys and girls students at Undergraduate level.

T-test value for the comparison between the mean

scores of reasoning ability of boys and girls students at Undergraduate level is 0.845, which is not significant at 0.05 level of significance. Therefore, it accepts the null hypothesis that there is no significant difference in reasoning ability between the boys and girls at undergraduate level. Hence, the reasoning ability of boys and girls are of same extent. The result accepts the null hypothesis as it is found that there is no significant difference and a similar kind of result was also found in the study conducted by **Okoro & Uyanga (2014)**, wherein the results showed that there was no significant difference due to gender in the syllogistic reasoning ability as well as the performance of students in Psychology of Learning. **Ongcoy (2016)** in their study found that there was no significant difference in students' logical reasoning abilities according to their gender. There may be various reasons of this result. Both male and female students may have attended the test seriously and therefore their scores are more or less the same.

#### DISCUSSION-3

Comparison between the mean scores of reasoning ability of Undergraduate level boys (arts and science) students.

T-test value for the comparison between the mean scores of reasoning ability of arts and science students at Undergraduate level is 0.067, which is not significant at 0.05 level of significance. Therefore, it accepts the null hypothesis that there is no significant difference in reasoning ability between the arts and science at undergraduate level. Hence, the reasoning ability of arts and science are of same extent. The result accepts the null hypothesis as it is found that there is no significant difference and a similar kind of result was also found in the study conducted by **Kanimozhi & Ganesan (2017)** that there existed no significant difference in reasoning ability among higher secondary students in terms of gender. Moreover, it could be interpreted that both male and female students were uniform in reasoning ability.

#### DISCUSSION-4

Comparison between the mean scores of reasoning



ability of Undergraduate level girls (arts and science) students.

T-test value for the comparison between the mean scores of reasoning ability of arts and science students at Undergraduate level is 0.038, which is significant at 0.05 level of significance. Therefore, it rejects the null hypothesis that there is no significant difference in reasoning ability between the arts and science at undergraduate level. Hence, the reasoning ability of Undergraduate level boys (arts and science) are not of same extent. The result rejects the null hypothesis as it is found that there is a significant difference and a similar kind of result was also found in the study conducted by **Patoliya (2017)**, in which the findings threw light on the fact that there existed significant differences between different streams based on their Reasoning Ability Tests. It was also found that there existed significant differences among reasoning ability of the students on the basis of their gender.

## Conclusion

Therefore, it can be concluded by stating that reasoning is a thoughtful activity that has crucial importance during the whole life. The above research has been conducted to measure the reasoning ability among the undergraduate level students on the basis of their streams and gender in Sonitpur district, Assam. After the analysis of collected data and application of appropriate statistics, it is clear that undergraduate level students have moderate level of reasoning ability. On the other hand, no significant difference was found in reasoning ability between arts and science students at Undergraduate level and the reasoning ability of both boys and girls students are found of same extent. Moreover, a significant difference was found in reasoning ability between Undergraduate level girls (arts and science) in Sonitpur district and the reasoning ability of Undergraduate level girls of arts and science stream are not found to be of same extent. So far as reasoning ability is concerned, students are encouraged to practice their reasoning skills in many settings, from their other classes to their

practicum sites, student organizations, residence hall councils and other areas, to gain practice and confidence applying their thinking skills.

## Suggestions for future studies

Taking into consideration the importance of reasoning ability in the present time, there is great importance to undertake further research studies in this particular area. Some of the suggestions for further research are:

1. The area of this study is limited to Sonitpur district of Assam only. Further studies should be conducted in this area of study by covering a large area.
2. In this present study, only a few variables were studied. Further studies should be undertaken by including some more variables.
3. The present study is also limited to determined disciplines of study. Therefore, further research can be conducted by including various disciplines of study.
4. The sample of the study included only the undergraduates in this study. Further studies can be conducted by taking different levels of students.
5. Reasoning ability has many different meaning and perspectives. Hence, further studies can be undertaken keeping in mind the various perspectives such as attitude, aptitude, intelligence, learning, etc.

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