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Summary, Findings, Suggestions & Implication
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Chapter – 7
Summary, Findings, Suggestions & Implication

7.1.0 Introduction

This chapter deals with the research summary, findings immerge out from the interpretation of the data, educational implications for teachers, few suggestion for parents and students are also stated out. Suggestions for further researches are also noted out.

7.2.0 Summary

Speed has been a working force in each field in Rocket age. One whose speed is more, he/she can achieve the determined development. Now delay or slackness is not affordable in each field of life over and above examination. The tale of Tortoise and Rabbit indicates, that continuity wins rather than speed. If the speed is proper but in the pride of the speed, if idleness comes in then one cannot be the winner. Point wise summary is as follow.

7.2.1 Importance

The importance of the present study has been described in many ways. In the present study, a study of the SA of the students was assessed in the context of some variables. In the curriculum of the Higher Secondary schools, subjects like Mathematics, Science, Elements of Accountancy, Statistics, Logic, Economics, Psychology and Business Organisation and Management are taught. To achieve higher scores in the listed subject, one has to learn some special skills in each subject. If the students of the Science stream do not take enough care about the SA in measurement or are not aware about the proportion of quantity of the material to be used in experiment, then many dangerous results can be immerged out in future. The student of Mathematics has to understand the basic concept and to calculate time and accuracy. A student of Mathematics has to know that in how much time and by how many efforts the desired results can be obtained. The person, who has developed the skill of SA, will not commit mistakes. It would be important to know that whether there is improvement achieving in this ability every year or
not? The present examination system is not able to access-out such abilities, therefore such assessment will be possible by this research.

The presents study would be useful to know the SA of the students studying in Std, XI and XII in the Arts, Commerce and Science stream. An assessment scale would be available for the classification of the students on the basis of their SA with the help of this test. The educational objectives could be assessed and necessary feedbacks or directions could be provided to the persons associated with education filed particularly who are busy in guidance and counselling field. The parents will be benefited by this study who want to know the level of their words about the SA level. This study would be able give proper guidance to their children regarding the selection of their future education line. The teachers could select appropriate students for any project work. It will help the teacher to forecast the success of their project work. By assessing the student's knowledge with the help of their SA, appropriate recommendations and educational guidance could also be given by the principals, parents and trustees. Proper guidance could be given to the weak students in terms of their SA ability. The out comes of the study could provide guide lines for the curriculum designers about future changes in curriculum.

Thus, according to the investigator the present research became important as it would be useful to identity the skills in the students of Science, Commerce and Arts stream and to avoid the discrepancies in that and also to decide the guidelines in this context.

7.2.2 Objectives

The present study was divided into two main sections:

Section-I : Construction and Standardization of the Test

For that, two objectives were framed-out and they were as below:

1. To construct a test to measure SA of the students.
2. To standardize the test of SA (SA)
Section-II :  Effect of various independent variables on the level of SA of the students

For that, seven main objectives were framed out. They were as below:

1. To decide the level of SA of the students in context to various variables under the investigation.
2. To decide the effect of the residential area of the student on the level of SA.
3. To decide the effect of gender on the level of SA of the students.
4. To decide the effect of stream on the level of SA of the students.
5. To decide the effect of standard on the level of the SA of the students.
6. To decide the effect of father's occupation on the level of SA of the students.
7. To decide the effect of the level of educational achievement on the level of SA of the students.

7.2.3 Hypotheses

In order to assess statistically the objectives no. 2 to 7 of the present study, 72 null hypotheses were framed out. For this, nearly 180 t-values were computed. As the numbers of the null hypotheses were 72, they have been not listed here. The common form of the null Hypothesis was as follow:

Ho  There will be no significant effect of variables like area, gender, stream, standard, occupation of father and level of educational achievement on the level of SA of the students.

7.2.4 Variables under Investigation

Dependent Variable :  SA of the students was treated as dependent variable.

Independent Variable :  Area (Rural, Urban), Gender (Boys, Girls), Stream (Science, Commerce, Arts), Standard (Std. XI, Std. XII), Occupation of father (Service, Self-
employment, Agriculture, Other occupation) and Educational Achievement (High, Average, Low) were treated as Independent variables.

**Controlled Variable**: Medium of the instruction: say Gujarati medium was considered as controlled variable.

### 7.2.5 Limitations

1. The present study was limited to the students studying in Higher Secondary schools of Gujarat state.
2. The present study was limited to the students studying in Higher Secondary Schools of Gujarati medium.
3. The present study was limited to the students studying in Higher Secondary Schools having all the three streams e.g. Science, Commerce and Arts.
4. This study was limited to the normal students only and the abnormal like Deaf, Dump, Blind and Physically handicapped students were not included in this study.

### 7.2.6 Definitions of key words

- **SA**
  
  For completing any task or for achieving goals successfully, the true capacity in living being, the time taken for completing the task and the ability to do the work faultless is called the ability of SA.

  - Operational definition
    
    The true scores earned by the students on the test constructed and standardized by the investigator were considered as the SA.

- **Occupation of father**

  1. **Service**: Occupation where some fixed income the person gets for some certain time in the Government or Private institution. e.g. The worker working in the bank, driver, peon etc.
2. **Self-employment**: Occupation in which the income is being generated by one’s own skill. e.g. Painter, Carpenter, Tailor, Masonry, Doctor.

3. **Agriculture**: Occupation in which the person is working as a farmer was treated as the occupation of Agriculture.

4. **Others**: Occupation except the above mentioned three types were considered as the ‘other’ occupation.

- **Educational Achievement**
  
  The percentage of total marks obtained in the board examination of Std. X, by the students of Std. XI and the percentage of total marks obtained in the final examination of Std. XI by the students of Std. XII were treated as the Educational Achievement of the student. The educational achievement level was decided as follows:

  o High level - 75% or more than that : A group
  o Average level - 55% to 74% : B group
  o Low level - less than 55% : C group

  The theoretical definitions were given in the review of related literature. Components related to the SA are similarity in words and numbers, difference in words and numbers “ુંગ_મંગ”, phonetics of the words and Mathematical symbols “પોપટ__પોપટી, ૨÷૨÷૨÷૨”, difference in the pronunciation of the words and numbers “ઝંગલ__મંગલ”, numbers of the words and numerical,…etc were selected as the content. Accuracy components like the look of the letter and numbers “થતી__યતી”, ordinal distance in words and numbers “કલમ__કમલ”, sequence related to the letter and numbers “ગોધરા__ગોદરા”, etc were included.

  The factor affecting on the SA were age, structure of the body, experiences, time taken for the measurement, interest, language ability, gender, occupation, weather effect. The remedies for this factors were also suggested.
The review of related literature was carried out by the researcher. The previous researches were also included which were five International, five National and nine State level. Analysis of the findings of the all 19 researches was done. The research gap was worked out by the analysis of the findings of all the studies. A detailed discussion was noted down here. By this discussion, how the present study differentiate from other researches was evolved out.

For any research, the planning for the solution of the problem should be scientific, logical and simple. Such planning helps to reach the good decided by the researcher.

The students studying in the Higher Secondary Schools, having all the three streams: Science, Commerce and Arts and situated in the Gujarat State such as Ahmedabad, Gandhinagar, Mehsana, surendranagar and Vadodara districts having Gujarati medium were considered as population in the present study.

As the test was to be standardized during the various stages of establishing reliability, validity and various tryouts the sample selection has done as follow:

- **Pre-Pilote tryout**:

  The students studying in Higher Secondary Schools of Ahmedabad were considered as representatives for pre-pilot. Total 108 subjects (students) were selected in sample by purposive sampling technique in which total 36 students (18 boys and 18 girls) from Std. XI and Std. XII from Science, Commerce and Arts stream.

- **Pilote tryout**:

  The sample selected for pre-pilot was used for pilot try-out.

- **First tryout**:

  Total 420 (210 boys and 210 girls) students were selected from the selected Higher Secondary Schools having Science, Commerce and Arts stream, from Rural and Urban area of five districts included in the study. Total 210 (105 boys and 105 girls) students were selected from Urban area of the
three streams ($70 + 70 + 70$). Similarly from Rural area 210 (105 boys and 105 girls) students were selected of the three streams ($70 + 70 + 70$). From each stream and each school, 35 boys and 35 girls were included in the sample. Stratified random sampling technique was used.

- **Final tryout:**

  The investigator selected total 1800 students for final administration from Rural and Urban area of five districts of Gujarat. i.e. Ahmedabad, Gandhinagar, Mehsana, Surendranagar and Vadodara district. The selection of districts and schools were done by random method (draw system). Out of each district total 360 students were selected in which 180 students of Urban area and 180 students of Rural area were included in which 90 boys and 90 girls from each stream were selected by stratified randomized sampling technique.

- **Sample for retesting:**

  After one month of the final testing, 118 students out of 1800 students were selected by draw method keeping in view the representation of each school, standard, area, sex and stream.

### 7.2.7 Tools used for the study

The detailed information about necessary tools used in the present study were as under:

1. **Information Schedule**: To get basic information like Name, Name of the school, residential area, Gender, Stream, Standard of the study, Occupation of the father and Educational achievement, a schedule was prepared and it was place on the title page of the test to measure SA.

2. **Test to measure Speed and Accuracy (SA)**: The investigator decided to construct a fresh test instead of available test. The Minnesota Clerical Aptitude test and SA test constructed by K. G. Desai were taken as base for constructing a new test. The present test was divided into two parts. (1) comparison of numbers and (2) comparison of names. In all ($200 + 200$) total 400 test items were constructed. They were given to experts for evaluation and gradation. The items were corrected on the basics of
obtained suggestions. Facility of the items were decided on the basis of the grade assigned by the evaluators. Then the test was passed from various tryouts. The final test having total $180 + 180 = 360$ items was prepared and its reliability as well as validity were established. For wrong responses, negative marking was done. By deducting total wrong answers from total correct answers, true responses were decided and were treated as true score. This score was treated as SA of each student.

3. **SA Test constructed by K. G. Desai**: The following were the details of K. G. Desai’s test.

- There were two sub-tests (1) Comparisons of numbers - 200 items and (2) Comparisons of names - 200 items

- This test was used for normal student of Std. 8, 9 and 10. Students of Commerce stream of Std. XI and Std. XII, clerks of Government office, commerce graduate and for college students. The said test has been used by many researchers.

- The reliability coefficient of the said test were 0.85 and 0.99 by Test-Retest and Split-half method.

In the present study, Speed-Accuracy Test prepared by K. G. Desai was used for establishing validity of the test constructed by the investigator.

### 7.2.8 Data collection

For the data collection, the permission of the all five districts schools’ principals including Rural and Urban area was taken. After the permission of school, the students were taken to a separate room other than their own class. They were given oral instruction as stated in the manual of the test. At this time, it was made clear that there would be negative marking for incorrect answers. There after, they were told to not down the primary information in the given schedule. After checking the filled information, they were asked to start to respond the test items.

For two section of the test, the time of eight minutes for each one was allotted. The students had to mark (√) for the correct pair but if the pair
is not correct than one has not to put any sign in the space given between them. For assessing the responses of the students, a scoring stencil was used during try-outs and with the help of it, total correct and incorrect responses were counted. True score for each student was computed by subtracting numbers of incorrect responses from correct numbers of responses.

7.2.9 Reliability and validity

The reliability of the test was determined by Test-Result, Split-half, Rullon formula, Fleneal formula, KR$_{20}$ and Cronbach $\alpha$ method. The range was between 0.76 to 0.97. To decide the validity of the test, Face validity, Congruent validity, Concurrent validity, Construct validity were estimated. The range of validity was between 0.36 to 0.60. The norms were established in forms of PR. Beside that, a test manual and the rules for the administration of the test were decided. The guidelines were also prepared for qualitative evaluation of the testee on the basis of PR for the SA like A: Very good, B: Good, C: Average, D: Bellow Average, E: Poor.

7.2.10 Data Analysis

According to research design, keeping in view the various variables of the study by making entry of the responses item-wise and section-wise, the true scores were computed. Keeping in view, each independent variable and its levels frequency distributions were prepared. With the help of each frequency distribution, the Mean, SD and were computed by using Excel programme.

The categorization of SA was done on the basis of Q-value. Above Q$_3$, High, between Q$_1$ and Q$_3$ Average and below Q$_1$ Low. Students whose last examination percentage having more than 75% and its above were treated as High achievers group A, percentages in between 55% to 74%, Average achievers group B and students having less than 55% were treated as Low achievers group C. Keeping in view the various variables, total 72 (12 x 6) Null hypotheses were framed and they were tested by ‘t’ test.
7.3.0 Findings

A detailed discussion about the data analysis and the interpretation of the data was done in the chapter VI. In chapter – V, the methods for the validity and reliability of the SA test were discussed. Main findings based on variables under investigation were derived. They are listed below.

- Significant difference was observed in case of scores of section-I, Section-II and whole test for high level of SA, average level of SA and for the total scores of Rural and Urban students. The difference was in favour of rural students. This result was adverse than the assumption that the urban students would possess more SA.

- With consideration of Gender, the significant difference was observed in favour for girls for the Section I, Section II and whole test high percentage of for girls having high and average SA and for boys having low SA was observed.

  Significant effect of gender was seen in high level, low level and whole test scores. All results were in favour of girls.

- In the context of stream, the average of the science stream students was high than Commerce and Arts stream in case of Section I, Section II and whole test of SA. High percentage was observed in high and average level of Science students in case of Section I, Section II and whole test of SA.

  In SA, Science and Commerce students were better than Arts students. This result was supported to the initial assumptions.

- In the context of standard, the average of the students of Std. XI was higher than that of student of Std. XII in case of section I, Section II and whole test of SA. No significant difference was observed in case of scores of high level, low level and whole level of std. XI and XII students while the significant difference was observed at 0.01 level for average level on the whole test. This difference was in favour of the students of std. XII. This result was supported the assumption 6.5.0, shown in para. but the entire results was not supported as stated in para 6.5.0.

- When the SA on Section I, Section II and whole test were evaluated in the context of father's occupation, it was observed that SA was higher for the students whose father was self employed.

  According to the level of SA on Section I, Section II and whole test, the average percentage was high in case of students whose father's occupation was
service. Serviced fathers’ children were superior than that of high and average level of self employed, agriculture and ‘others’ children. While in low level, the percentage was high in case of ‘others’ than who were employed in service.

- In the context of educational achievement, the average of the students of high educational achievement was high with compare to the students having medium and low educational achievement. Looking to the scores of SA on section I, II and whole test, the percentage was high for high educational achievement. In case of medium and low level, medium educational achievement of the students had high average. Same results were observed in context of different demographical variables when educational achievement was the base.

- In all 72 (12 X 6) null hypotheses were framed on the bases of variables under investigation. These all the hypothesis were tested by using t-value. In all 180 t-values were computed. Out of which t-value of area (09), gender (06), stream (22), standard (01), father's occupation (38) and educational achievement (24), were significant at 0.01 level, For gender (01), stream (05), father's occupation (06), educational achievement (02) t-values were significant at 0.05 level. The reaming t-values like area (03), gender (05), stream (09), standard (11), father's occupation (28), educational achievement (10) were not significant.

- The reliability of the test was determined by Test-retest, split-half, Rullon formula, Flenegal formula, KR-20 & Cronbach’s α (alpha) method. The value of reliability were ranging in between 0.76 to 0.97 which suggested that the test was reliable.

- The validity of the test was estimated by Face validity, Congruent, Concurrent & Construct validity method. The value of validity was between 0.36 to 0.60 which shows that the test was valid. The reliability and validity of the test declares that this test is really reliable and valid to measure SA of the higher secondary students.
7.4.0 Educational Implications:

After comprehensive analysis and interpretation of data, many findings were occurred. Out of these findings, some important findings were selected and implications on the basis of these findings are stated below:

1. Students obtain less scores on section II (Comparison of names) than those on section I (comparison of numbers). By organizing training, based on the comparison of names, one can increase the said ability.

2. There was significant effect of area on SA and it was found in favor of Urban students. So, by arranging such programmes one can increase this SA of the Rural students.

3. There was significant difference between the SA of boys and girls and in most of the cases and, it was in favor of girls. So to bring boys up one has to provide special training to boys.

4. In most of cases, there were significant effect of the stream of the study on SA. The SA of the students of Commerce and Arts stream as compared to Science stream, students of Science stream were found superior. In such circumstances, one should arrange special programme for the students of Arts, to enhance the SA of such students.

5. There was no significant difference between the SA of students of Std. XI and Std.XII. It is essential in competitive world the students are to be prepared for competitive examinations, one should arrange programmes to enhance their SA.

6. Keeping in view the occupation of the father of the student, this ability was found high in case of those students whose fathers are serviced person. In such situation one should arrange programmes for the students whose father’s occupation is other than service.

7. There was high correlation between the educational achievement and the levels of SA of the students. In such situation more care about enhancing achievement level may lead automatically in enhancement of SA level. Schools should pay more attention in teaching of related subjects. Due to that automatically the SA will increase.
7.5.0 **Suggestions**:

The investigator had made some suggestions for to use this test. Besides that, some suggestion are made for further researches too.

7.5.1 **General Suggestions**

- The test users has to take enough care, suggested in the manual, while administering the test of SA.

- Seating arrangement of the students and the distance between two students should be maintain, so that the students could not copy from each other.

- Scoring key must be use with enough care so that true level of SA can be decided accurately.

- Accuracy is to be maintain while computing True Score and conversion of it into T-Score.

7.5.2 **Suggestions for the stake holders**

The present study may lead the meaningful follow-up work to the students, teachers and parents. The researcher had made some suggestions and are stated below

- **Suggestion for the students**:
  
  o The students should learn more about SA in the school.
  
  o Every student should take part in the activities such as elocution completion, singing completion, poem recitation, seminar, group-discussion and co-curricular activities in the school. Such activities may help them to enhance their SA. Students are supposed to develop the understandable SA habit instead of exam oriented SA.
• **Suggestion for the teachers :**
  
  o The teachers should carry-out the action research related to the SA and also to find out the causes for it. They can take-up special drive to enhance the SA of the students.

  o Discussion in the classroom should be carried out in the context of SA. Teachers should cross-check about the outcomes of the results of action research properly.

  o The teacher should try to know the factors related to low accuracy in those students having low level of speed-accuracy and should provide the guidance related to it.

• **Suggestion for the parents :**

  o Parents should do the activities related to the speed-accuracy at home.

  o Parents should always try to talk clearly and precisely about ups and downs with appropriate SA at home. They should also provide understanding about its future benefits.

### 7.5.3 Suggestion for future research

The researcher had tried to give some titles related to this study for further research.

- A study of the SA of the students studying in English medium higher secondary schools in the context of some variables.

- Construction and standardization of the SA test for the student studying in higher education.

- A study of the relation between educational achievement and speed accuracy of the students of higher secondary schools.

- A comparative study of the SA of urban and rural students of the higher secondary schools.

- A study of creativity, intelligent quotient and educational achievement in context to the SA of the students.
• A study of the SA of the students studying in Uttar Buniyadi (Basic) stream in context to some variables.

• A comparative study of SA of the students studying in different medium of instruction.

• A comparative study of the SA of backward and general students of higher secondary schools.

7.6.0 Conclusion:

The investigator has tried to justify the research selected for her doctoral study. Inspite of having limited experiences about the research, the investigator has tried to follow all the scientific procedures with the help of guide. The researcher has taken enough care to write the report errorless. It is difficult to prepare the report error free for freshers. There may by few errors due to proof-reading. This error may be apologized.