Chapter-8

Summary, Finding and Recommendation

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8.1.0 Introduction

Research in every field and more so in the field of education is demand of the day. Progress in any field is directly linked with research in that field. Our problems and difficulties in the field of education further necessitate a purposeful and sustained research effort.

8.2.0 Summary of the work

The heart of the present study was about Construction and Standardisation of Competency-based and Action-oriented test in Mathematics for Grade V, VI and VII.

First of all Items were prepared for the selected sixteen (16) Action-oriented competencies for all the three grades. All the constructed items were logically reviewed by a panel of experts and on the basis of the experts’ suggestions, some items were corrected and reviewed. Thus a form of the test for grade V, VI and VII with total items 20, 14 and 12 respectively were prepared for pre-piloting.

After generating the test items for Grades V, VI and VII, TLM design-effectiveness was found out by purposively selecting one Urban (Sabarmati Primary School-7) and one rural (Durgi Primary School, Ta- Viramgam) school. Twelve students (Boys-6, Girls-6) were selected from each Grade representing three levels of learners such as Low Achiever, Medium Achiever and High Achiever by purposive sampling technique. Thus, the sample size for pre-pilot was 36 students. The test was administered individually one by one to the testee and the necessary observations were noted down regarding the questions raised by the testees. The time taken by each testee belonging to each category was also
noted down. In view of such observations, the time duration and the necessary instructions were revised for the pilot study. There was no problem for understanding the items on the part of the testees. Thus, all the items were selected for pilot study.

For Pilot testing, the researcher selected six schools from Urban area and four schools from rural area from Ahmedabad district only. From each school and each Grade, Twenty-Twenty students were selected randomly from the attendance register. In such situation the total sample for pilot study comprised 60 students (Boys-30, Girls-30). The test was administered with the pre-permission of the schools to the sample selected for the same along with the mathematical kit and the test booklet.

At the end of the prescribed period of time, the test booklets were collected and scrutinized for scoring. The responses of the respondents were assessed and Difficulty Values (D.V.) and Discrimination Index (D.I) were calculated through NRTVB software. The items of which the Difficulty Values (D.V.) was found to be between 0.30 to 0.80 were considered as an appropriate items. Finally 20, 14 and 12 items were selected respectively for Grades V, VI and VII. The items were arranged according to their Difficulty Values (D.V.) and the final form of the test was prepared.

For the final testing, the sample selection was done by using multi-stage sampling technique. The entire process was as follows.

Twenty (20) districts were selected by draw system. From each district one taluka was also selected by draw system. From each Taluka one school was selected by voluntary sampling technique. At the time of selecting school, it was kept in mind that the voluntary school must have all the three grades. i.e. Grade V, VI and VII. The selection of students from each class was made by systematic randomisation sampling technique. i.e. from attendance role for boys and girls, students having their roll numbers 5, 10 and 15 were selected. In such case the sampling technique becomes stratified systematic randomised. The final sample consisted of 180 boys and 180 girls and the grand total of the sample was 360 at the time of data analysis. The final run was carried out during the end of the academic year 2010-11 to decide their achievement levels grade wise and competency wise.

To establish the reliability of the test, the Test-Retest, Split-half, Cronbach alpha and Kuder-Richardson methods were employed. The construct validity was established with the help of NRTVB software. The internal consistency of the items was also determined by t-test.
After fifteen days, re-testing was carried out to compute test-retest reliability. For that purpose the same sampling technique was used and the sample size was 40 (Boys-20, Girls-20) for each grade. Thus the total sample size for retesting was 120 students.

The Reliability of the test was determine by

1. Test-Retest method
2. Split-half method, corrected by Spearman Brown formula
3. Cronbach’s alpha
4. The range of reliability co-efficient was 0.84 to 0.94
5. All these methods shows different results, but they indicated a good reliability.

The Validity of this test was checked through Cliff’s Consistency ‘C’. The range of ‘C’ was 0.32 or more than that for validity.

8.3.0 Findings

The major findings of the present study were as follows :

- The reliability of the test for Grade V ranges between 0.86 and 0.93.
- The reliability of the test for Grade VI ranges between 0.84 and 0.94.
- The reliability of the test for Grade VII ranges between 0.87 and 0.93.
- For the validity purpose cliff’s consistency indice ‘C’ was computed. The value of ‘C’ for Grade V, VI and VII 0.39, 0.63 and 0.43 respectively. These values are higher than 0.32.
- No student scored ‘Zero’ mark.
- Average percentage of achievement for the students of Grade V at ‘very good level’ was 78.3 percent and at ‘poor level’ it was 19.9 percent.
- For Grade VI, the average percentage of students’ achievement at ‘very good level’ was 56.1 percent while 25.6 percent of student were at ‘poor level’.
- Average percentage of achievement for the students of grade VII at ‘very good level’ was 39 percent and at ‘poor level’ it was 33 percent.
- For Grade VI students competencies 6.6.1A, 6.6.1 B, 6.6.5 and 6.6.6, for Grade VII only 6.7.5 competency were identified as hard spot. No hard spot was found for Grade V students.
- The Area effect on achievement of the students of all the three grades was not found significant.
• The gender effect on achievement of the students of all the three grades was not found significant.

Competency Based Findings

Competency based achievement at mass level, area wise and gender wise were calculated for grade V, VI and VII students. The main conclusions are presented as follow:

- **Area wise**
  - **Grade V**:

    At very good level, the average achievement of Urban students was higher than that of Rural students for the competency number 1.5.1, 6.5.2 A and 6.5.10. For the remaining two competencies 6.5.2 B and 6.5.6 the picture was reverse.

    The average achievement of Rural students at good level is higher than that of Urban students for the competencies 1.5.1 and 6.5.10. For the remaining competencies 6.5.2 A, 6.5.2 B and 6.5.6, no student falls in both the categories.

    At poor level, the average achievement of Urban students was higher than that of Rural students for the competency number 1.5.1, 6.5.2 B and 6.5.6. For the remaining two competencies 6.5.2 A and 6.5.10 the picture was reverse.

  - **Grade VI**:

    At very good level, the average achievement of Urban students is higher than that of Rural students for the competency number 3.6.3, 3.6.6, 6.6.1 A, 6.6.5, 6.6.6 and 8.6.4. For the remaining two competencies 6.6.1 B and 6.6.4 A the picture was reverse. Both of their percentages were equal for the competency 6.6.4 B.

    The average achievement of Urban students at good level was higher than that of Rural students for the five competencies 3.6.6, 6.6.4 A, 6.6.4 B, 6.6.5 and 8.6.4. For the remaining two competencies 6.6.1 A and 6.6.1 B the picture was reverse. For the competency 3.6.3 no student falls in both the categories.

    At poor level, the average achievement of Rural students was higher than that of Urban students for the competency number 3.6.3, 3.6.6, 6.6.4 A, 6.6.4 B, 6.6.5, 6.6.6 and 8.6.4. For the remaining two competencies 6.6.1 A and 6.6.1 B the picture was reverse.
• Grade VII:

At very good level, the average achievement of Urban students was higher than that of Rural students for the competency number 4.7.11 and 6.7.5. For the competency 6.7.10 the picture was reverse.

The average achievement of Rural students at good level was higher than that of Urban students for the two competencies 4.7.11 and 6.7.10. For the competency 6.7.5 the picture was reverse.

At poor level, the average achievement of Rural students was higher than that of Urban students for the competency number 6.7.5. For the competency 6.7.10 the picture was reverse. For the competency 4.7.11 the average achievement of both the area were equal.

**Gender wise**

• Grade V:

At very good level, the average achievement of Girls was higher than that of Boys for the competency number 1.5.1, 6.5.2 B and 6.5.6. For the two competencies 6.5.2 A and 6.5.10 the picture was reverse.

The average achievement of Boys at good level was higher than that of Girls for the competencies 6.5.6 and 6.5.10. For the competency 1.5.1 the picture was reverse. For the competencies 6.5.2 A, 6.5.2 B and 6.5.6, no student falls in both the categories.

At poor level, the average achievement of Girls was higher than that of Boys for the competency number 1.5.1, 6.5.2 B and 6.5.10. For the competencies 6.5.2 A and 6.5.6 the picture was reverse.

• Grade VI:

At very good level, the average achievement of Boys was higher than that of Girls for the competency number 3.6.6, 6.6.1 B, 6.6.4 A, 6.6.5 and 6.6.6. For the competencies 3.6.3, 6.6.1 A and 8.6.4. the picture was reverse. Both of their percentages were equal for the competency 6.6.4 B.
The average achievement of Boys at good level was higher than that of Girls for the competencies 3.6.6, 6.6.1A and 8.6.4. For the competencies 6.6.1 B and 6.6.5 the picture was reverse. For the competencies 6.6.4 A, 6.6.4 B and 6.6.6 the average achievement of both the gender, the percentages were same. For the competency 3.6.3 no student falls in both the categories.

At poor level, the average achievement of Girls was higher than that of Boys for the competency number 3.6.6, 6.6.1 A, 6.6.1 B, 6.6.4 A, 6.6.5 and 6.6.6. For the competencies 3.6.3, 6.6.4 B and 8.6.4 the picture was reverse.

- Grade VII:

At very good level, the average achievement of Boys was higher than that of Girls for all the competencies 4.7.11, 6.7.5 and 6.7.10.

The average achievement of Girls at good level was higher than that of Boys for all the competencies 4.7.11, 6.7.5 and 6.7.10.

At poor level, the average achievement of Girls was higher than that of Boys for the competency number 4.7.11 and 6.7.10. For the competency 6.7.5 the picture was reverse.

### 8.4.0 Discussion of the finding

As far as the title of the study concerned, no study was carried out for the Action-oriented competencies for any grade or any subjects. So one can not direct compare the findings of the study to any other one. But there were studies related to Written competencies for all grades and subjects.

According to GAP (Gujarat Achievement at Primary) V (including Grade III to Grade VI) conducted by GCERT, Gandhinagar, it was reveal that 80% of students were not successful at 75% level achievement in Mathematics for any grade at state level in the academic year 2008-2009. Hence, it can be inferred that students did not achieve mastery level in any subject in the framework of MLL program. This story of the academic achievement of the primary school children of Gujarat was same in GAP-1, GAP-2, GAP-3 and GAP-4 conducted in the academic year 1998-99, 2000-02, 2002-03, 2004-05 respectively. It was very clear that in the 75% achievement level 29.85% students for grade V and 21.40% students for grade VI were found for the Mathematics subject.
It was practically expected that 50% students should pass at 50% (or More) level of achievement in the context of the implementation of MLL program. For both the grade V and VI, 54.17% and 59.6% students achieve in this level. So, here the criteria was satisfied.

At the traditional passing standard of 35% level, 76.53% and 79.52% students of grade V and VI respectively were successful.

For Grade V, there was not a major difference between the achievement of boys and girls, while for Grade VI, the achievement of girls was higher than that of boys.

Present study shows that 78.3% students achieve the mastery level for grade V, while for grade VI the percentage was 56.1%. Also the effect of both the variables (Area, Gender) were non-significant.

Though, the comparison of the results of present study has done with other studies but, it must be kept in mind that out of the two studies which were used for comparing the achievement level of the students, one was conducted on Gujarat State pupils for written competencies only, while the present study was conducted on selected 20 Districts of Gujarat state pupils for Action-oriented competencies. This is the major difference one should not lose it sight off.

8.5.0 Educational Implication

- All the three tests were found to be reliable and valid. They can be used to decide the achievement level of the students of Grades V, VI and VII particularly for Action oriented competencies.

- The percentages of poor level performance were 19.9, 25.6 and 33 for grade V, VI and VII respectively. By design and utilize effective Teaching Learning Material (TLM), one can up lift the performance.

- Looking to the percentages of poor level performance, the said performance can be achieved by changing syllabi, use of effective tool-kit and text-books.

- For minimizing Hard-spots, special training for teachers can helped. So that it is to be redesign.
• For Grade VI Field 6: Geometry seems to be tough for the students. An effective use of TLM, an interest creating situation and motivation from teachers will help to make it easy and interesting.

• If the teacher knows the level of the pupil in Action based Competency based achievement, s/he can plan remedial programme accordingly. For this purpose, s/he can make use of this test. It will facilitate him to give individual attention and he will be more realistic in his expectation from different individuals. Individual remedial teaching can help to over-come the issue.

8.6.0 Suggestion

To make this new approach successful and to peep into the aspects and fields related to the approach some suggestions are given here for further actions and studies -

8.6.1 Suggestions for further Action

- Suggestions for teachers and Principals of the Schools-

  - The teachers should understand that the Action-oriented competencies are nothing but the specific objectives, which are expected to be achieved by the students at the end of teaching-learning process, so the teaching work should be carried out by keeping these objectives in mind.

  - Proper teaching strategies and methods should be developed for the teaching of particular concepts of Action-oriented competencies.

  - Continuous and comprehensive evaluation of the students regarding Action-oriented competencies should be planned and execute it.

  - Remedial teaching work must be done for the weak competencies of the students. The method used for remedial teaching should be different from the previous method so that the students can understand the concept which they could not understand by the previous method of teaching.

  - Time to time feedback should be provided to the students about their learning and achievement.
• Identified hard spots in Mathematics should be taken into consideration at the time of teaching and sufficient practice should be given to the students for such hard spots.

• The principals of the schools should see that competency based and Action-oriented planning and teaching work should be done by the teachers of their schools. It should also be observed properly and he should guide the teachers for the same.

• The principals should also aware about the approach so that they can guide their teachers whenever they require.

• **Suggestions for the state government and education departments including DIETs.**

• The present generation of teachers should be acquainted with the Competency based and Action-oriented approach, its importance and the urgent need to improve the present system of teaching, learning and testing processes.

• Competency based and Action oriented teaching materials and teaching aids should be provided to the teachers.

• Competency based and Action oriented tests and question banks should be developed for all the subjects.

• Feed back to the teachers in their day to day instructions and teaching learning strategies should be provided.

• On the basis of the construction of the test, various training programmes for primary school teachers can be organized.

• Special orientation programmes should be conducted about the identified hard spots in Mathematics for the teachers training in grade V, VI and VII and proper teaching learning material should developed and circulated to the institutes and teachers.

• Surveys must be taken up for assessment of Action oriented Competencies in different schools, different classes and different subjects.
8.6.2 Suggestions for further Research

As Competency based and Action-oriented approach is still a new intervention, more intensive and expanded research work is desired by research workers in this field. On the basis of review of the related literature it can be said that no work has been done in this field. It is felt that there is a dire need of conduction of researches in this area. It would not be possible to describe all that, which is to be done in this field, however it would not be out of place to give few suggestions for further research works. These are listed below.

1. The Action based and Competency based test in mathematics can be developed and validated in different areas of the various subjects and at various levels: School level, district level and state level.

2. The items for the Action based and Competency based tests can be generated by adopting different item-writing techniques and the results obtained by them can be compared with the result of the present tests.

3. The items of the present study from Grade V to VII can be reviewed empirically.

4. The effect of teachers’ qualification on achievement of Action based and Competency based Tests can be studied.

5. Impact of the type of schools (e.g. government, non-government schools, municipal schools, primary schools of Jilla Panchayat) on the achieving Action based Competencies can be taken as a research study.

6. These test have been standardized on the pupils studying in Gujarati medium for Mathematics, the same type of test can be constructed and standardized for the other mediums and for other subjects.

7. Special Research work can be done on the same type of test for other Grades.

8. Construction and Standardization of Oral test of Grade 3 to 7 for the primary school children.

9. A study for investigating common remarkable limitations in education system which are responsible for achieving Action oriented Competencies at mastery level.
10. Case study researches can be conducted for students who are very weak in many of the competencies identified for Action oriented Competencies.

11. Studies can be undertaken to find out the achievement level of the students other than Grade V, VI and VII.

### 8.7.0 Conclusion

The improvement in the quality of elementary education is an area of immense and prime importance and to achieve this goal, implementation of Action oriented Joyful learning and Competency oriented approach has already started in the primary schools of the state. The present work had undertaken to Construct and Validate the Action oriented and Competency oriented Test for mathematics of Grade V, VI and VII.

All the best efforts are made to make the study fruitful and faultless and proper precautions were taken by the researcher that there should not be any error in the methods of the study.

The researcher hopes that this report of the study will be useful to the related persons, education departments and DEITs for further actions to make the effort (Action oriented and Competency oriented test) more fruitful.

At the end let us hope to give the expected accountability to the school systems of education and let it to be move towards quality coupled with equity, which is the main aim of Action oriented, Joyful learning and Competency oriented approach.