7.0.0 Introduction

In the introductory part of the thesis, the significant role of creativity in the development of the personality of the child and the role of teachers in fostering creativity in the classroom, has been discussed in detail.

Creativity is of two kinds: (1) verbal (2) non-verbal. Testing of non-verbal creativity is more appropriate and called for in the early stages of pre-primary education where sensory education predominates. But at the stage where the children have a clear understanding of verbal interpretation of his level, verbal creativity can be measured easily. This includes more aspects than those of non-verbal creativity. Here the child has to select and opine on items in his own language while responding to the questions raised before him.

Looking to the stage of the development of children at the primary school stage, the investigator chose to undertake verbal creativity testing through the construction of test-items for the age group 11 to 13 years.

As there was no such tool available in Gujarati for the age group 11 to 13 which could measure creativity of the primary school children, the investigator felt a pressing
need to construct and standardize a creativity test in Gujarati for the primary school children of the said age-group.

In order to construct a valid verbal test of creativity, it was first necessary to define very precisely the term 'creativity' that was proposed to be measured through the said test. This has been done by reviewing a few definitions of the concept given by experts and test constructors. Besides, the investigator studied a few tests of creativity constructed by some experts in the field. Consultations with some experts in the field helped the investigator to come to a definite understanding of the concept of creativity and the components of a creativity-test. From these the investigator framed out behaviour components for the creative thinking ability test.

The selection of the test items which are considered to be the crux of the process of standardization, was made by carefully applying various statistical methods. This was done with a view to obtaining the internal consistency of the test. The test has been standardized by strictly following the principles of the test construction and standardization. The process of standardization has been fully described in the foregone chapters.
The reliability of the test has been established by various methods such as test-retest, split-half, rational equivalence etc., with the objective of overcoming the limitations of any particular method. The validity has also been established by following the general principles of test validation. The content, concept, concurrent and factorial validities have been established and reported in the chapter on reliability and validity.

In short, the test has been standardized on a sufficiently large, representative and adequate sample. The percentile age norms have been established to help the user to interpret the test scores.

To point out the usability of the test to the teachers and research workers, the investigator has also attempted to study a few related factors to creativity. This clearly indicates that the test can be used with ease by other researchers in the field of creativity.

The findings of these researches may be helpful to run in-service programmes for the primary school teachers. It also provides a guideline for necessary changes to be made in the teachers training programme of primary training colleges so that they might contribute to the cause of creativity in primary schools.
The investigator has kept in mind the need to construct and standardise such a tool as can measure creativity with precision. He has observed therefore all the principles and adopted procedures that can make the test an efficient tool.

7.1.0 Observations

The observations made by the investigator during the standardization and correlated studies are reported hereunder:

The investigator got help from experts in respect of the following:

i. Model selecting
ii. Item construction and selection
iii. Interpretation of responses
iv. The way of scoring and
v. The proper use of correlates.

The investigator's colleagues in his college helped him in preparing the items and in scoring and interpreting of responses.

The institutional heads extended their fullest cooperation in providing facilities for smooth administration of the tests. On the whole, right from the collection of
items to the final administration of the tests, co-operation from different corners was found forthcoming in abundance.

The students of the age group 11 to 13, on whom the programme was based were very co-operative. Some of the teachers also were found eager to answer some of the items as they found interest in the thinking aspect of the items themselves. Thus, the entire process of research was a matter of great joy and satisfaction.

7.2.0 Conclusions

The conclusions that are drawn on the basis of the results of the test have been categorised into two broad headings, namely: (i) the results of the test and (ii) the findings of the related studies. The results of the test are reported in the following paragraphs.

7.2.1 Area Differences

There is no significant difference between the mean performance of male and female children of rural and urban area. The mean difference between the rural and urban area is just 0.18. This difference is not significant. Hence it could be concluded without hesitation that there is no area difference in the creative thinking ability of the age group 11 to 13.
7.2.3 Sex Differences

There is no significant differences between the mean performances of male and female pupils. The difference between two mean scores of sexes is 1.86. It is in favour of the males. However, the difference is not significant. Hence, it could be concluded without any hesitation that there is no sex difference with regard to creative thinking ability of age group 11 to 13.

7.2.4 Age Differences

There is the marked difference between the mean differences of three age groups. The mean score of the age group 12 is higher by 9.14 points than the mean score of the age group 11. Similarly the mean score of the age group 13 is higher by 17.24 points than the mean score of the age group 12. These mean differences are significant at the .01 level of significance. This discussion proves the fact that there are differences with regard to creative thinking ability among the pupils of different age groups from 11 to 13. Therefore, the investigator has given only the norms for each age group.
7.2.5 Suitability of the Test

The justification of sampling and the Kurtosis also revealed that the test was quite suitable to the group chosen. The creative thinking ability is normally distributed in the population tested.

7.2.6 Reliability of the Test

The reliability of the test has been studied by different methods like test-retest and split-half. Over and above that different formulas like Spearman-Brown formula, Rulon formula and Flanagan formula were also applied for the study of reliability. The reliability coefficients as found out by the above methods are ranging between .78 to .92. All these reliability coefficients are very high. The comparison of the reliability coefficient of the present test with some other creative thinking ability tests also shows that the present test has a high reliability as compared to other creative thinking ability tests. From this, it has been concluded that the test is highly reliable for pupils of age-group 11 to 13 of Gujarat State.

7.2.7 Validity of the Test

Establishing the validity of the test is the crux of the process of standardization. Therefore, the test was validated with care and caution, using external criteria,
The content validity, congruent validity, concurrent validity, construct validity and factorial validity of the test have been established.

The content validity has been established against the criteria decided by the experts. The construct validity has been established with the help of the right type of evaluation process for analysing the items of the test according to the behaviour components. Each item, was thoroughly examined by the experts, in terms of behaviour component. The concurrent validity of the test has been established by validating the test scores with self-opinion of pupils about their creative thinking ability. The obtained validity coefficient is 0.58 which is considerably high. The congruent validity of the test has been established by validating the test scores with Torrance creative thinking ability test scores. The obtained validity coefficient is 0.82 which is quite high.

For the study of factorial validity of the test, the factor analysis technique was used. There were two significant factors. The first factor was in the area of sensitivity to problem which measures the seeing of defects, the seeing of needs, the seeing of deficiencies, the seeing of odds and the seeing of the unusual. The second factor was in the area of semantic spontaneous flexibility which measures novelty of description, novelty of imagination, originality etc.
In short the factors of the entire test indicate that essential abilities for creative thinking ability test are adequately loaded. Hence, it could be said that the test has a significant factorial validity making the test a valid tool. Thus the test meant for measuring the creative thinking ability of pupils is indeed a highly valid tool.

7.2.8 Norms of the Test

The norms for the age group 9 to 14 are given because the mean differences among these groups were statistically significant. Because of this fact it was thought fit to give percentile norms of these six age groups.

The separate norms for urban and rural area are not given because the groups are not differing significantly with each other.

The separate norms for male and female groups are also not given because the groups do not differ significantly with each other.

7.3.0 Related Studies

7.3.1 Socio-Economic Status and C.T.A.

The S.E.S. variable was divided into two levels. This variable was one of the variables in the study. The sample was of 210. The obtained F-ratio between the levels
of S.E.S. was 55.64 which exceeds the table value of F-ratio at .01 per cent level of significance. The obtained mean on C.T.A. of students belonging to the high S.E.S. group is higher than that of students belonging to low S.E.S. group. Hence it could be concluded that students with high S.E.S. have more C.T.A. than the students with low S.E.S. So it could be safely concluded that the higher the socio-economic status, the higher the C.T.A. of the students is.

7.3.2 n.Ach. and C.T.A.

The n.Ach variable was divided into two levels, namely high n.Ach and low n.Ach. This variable was also one of the variables in the study. The sample was of 210. The obtained F-ratio between the levels of n.Ach is 59.67 which exceeds the table value of F-ratio at .01 per cent level of significance. The obtained mean on C.T.A. of students belonging to the high n.Ach group is higher than that of students belonging to the low n.Ach group. Hence it could be concluded that students with higher n.Ach have more C.T.A. than the students with low n.Ach. It could be safely concluded that the higher the n.Ach, the higher the C.T.A. of the students is.

7.3.3 I.Q. and C.T.A.

The I.Q. variable was divided into two levels namely high I.Q. and low I.Q. This variable was one of the
variables of the study. The sample was of 210. The obtained F-ratio between the levels of I.Q. is 3.28 which does not exceed the table value of F-ratio at .05 per cent of significance. The obtained mean on C.T.A. of the students belonging to the high I.Q. group is higher than that of the students belonging to the low I.Q. group. Hence it could be concluded that the students with a high I.Q. do not have more C.T.A. than the students with a low n.Ach. It could be safely concluded that a higher I.Q. may not have a higher C.T.A. of the students.

7.3.4 Parental Behaviour and C.T.A.

The parental behaviour was divided into two levels, namely high parental behaviour and low parental behaviour. This variable was also one of the variables of the study. The sample was of 210. The obtained F-ratio between the levels of parental behaviour is 1.23, which does not exceed the table value of F-ratio at .05 per cent level of significance. The obtained mean on C.T.A. of students belonging to high parental behaviour group is higher than that of students belonging to the low parental behaviour group. Hence, it could be concluded that the students with a high parental behaviour do not have more C.T.A. than that of the students with a low parental behaviour. It could be safely concluded that a higher parental behaviour may not have a higher C.T.A. of the students.
7.3.5 Anxiety and C.T.A.

The anxiety variable was divided into two levels, namely high anxiety and low anxiety. This variable was one of the variables of the study. The sample was of 210. The obtained F-ratio between the levels of anxiety is 11.60, which exceeds the table value of F-ratio at .01 per cent level of significance. The obtained mean on C.T.A. of the students belonging to the low anxiety group is higher than that of the students belonging to the high anxiety group. Hence, it could be concluded that students with low anxiety have more C.T.A. than the students with high anxiety. It could be safely concluded that the lower the anxiety, the higher the C.T.A. of the students is.

7.3.6 Security Vs Insecurity and C.T.A.

This variable was one of the variables of the study. The security vs insecurity variable was divided into two levels, namely security and insecurity. The sample was of 210. The obtained F-ratio between the levels of security vs insecurity is 4.01, exceeds the table value of F-ratio at .05 per cent level of significance. The obtained mean on C.T.A. of students belonging to the security group is higher than that of the insecurity group. Hence, it could be safely concluded that the students with security have more C.T.A. than the students with insecurity. It could be safely concluded that the higher the security, the higher the C.T.A. of the students is.
7.3.7 Radicalism Vs Conservatism and C.T.A.

This variable was one of the variables of the study. The radicalism Vs conservatism variable was divided into two levels namely, radicalism and conservatism. The sample was of 210. The obtained F-ratio between the levels of radicalism and conservatism is 21.76 which exceeds the table value of F-ratio at .01 level of significance. The obtained mean on C.T.A. of the students belonging to the radicalism group is higher than that of the students belonging to the conservatism group. Hence, it could be concluded that the students with the radicalism trait have more C.T.A. than that of the students with the conservatism trait. It could be safely concluded that the higher the radicalism trait, the higher the C.T.A. of the students is.

7.3.8 Flexibility Vs Rigidity and C.T.A.

This variable was also one of the variables of the study. The flexibility Vs rigidity variable was divided into two levels, namely flexibility and rigidity. The sample was of 210. The obtained F-ratio between the levels of flexibility and rigidity is 18.87, which exceeds the table value of F-ratio at .01 per cent level of significance. The obtained mean on C.T.A. of the students belonging to the flexibility group is higher than that of the students belonging to the rigidity group. Hence, it could be concluded that the students with the flexibility trait have
more C.T.A. than the students with the rigidity trait. It could be safely concluded that the higher the flexibility trait, the higher the C.T.A. of the students is.

7.3.9 Suggestibility and C.T.A.

This variable was one of the variables of the study. The suggestibility variable was divided into two levels, namely high suggestibility and low suggestibility. The sample was of 210. The obtained F-ratio between the levels of suggestibility is 7.44 which exceeds the table value of F-ratio at .01 per cent level of significance. The obtained mean on C.T.A. of the students belonging to the low suggestibility group is higher than that of the students belonging to the high suggestibility group. Hence, it could be concluded that the students with low suggestibility have more C.T.A. than the students with high suggestibility. It could be safely concluded that the lower the suggestibility, the higher the C.T.A. of the students is.

7.3.10 Emotional Stability and C.T.A.

This variable was one of the variables of the study. The emotional stability variable was divided into two levels, namely high emotional stability and low emotional stability. The sample was of 210. The obtained F-ratio between the levels of emotional stability is 4.69 which exceeds the table value of F-ratio at .05 per cent level of significance.
The obtained mean on C.T.A. of students belonging to the high emotional stability group is higher than that of the obtained mean on C.T.A. of the students belonging to the high emotional stability group is higher than that of students belonging to the lower emotional stability group. Hence, it could be concluded that the students with high emotional stability have more C.T.A. than the students with low emotional stability. It could be safely concluded that the higher the emotional stability, the higher the C.T.A. of the students is.

7.4.0 Suggestions for Further Researches

The review of the past work done in the field of creative thinking ability noted that considerable work has been done on creativity in foreign countries, especially in U.S.A., while in India a few studies have been done in this field. The work done in this field in foreign countries shows that there is a vast scope for research work in this field in India. Here are a few problems suggested for further research in the area of creativity.

Comparative study of the C.T.A. of secondary school pupils can be undertaken.

Construction and standardization of a C.T.A. test for the secondary school pupils can also be done.
7.4.1 Some Suggested Problems


2. Preparation and try-out of a programme to improve pupils' C.T.A.

3. Construction and try-out of a test measuring different aspects of C.T.A. for a particular standard.


5. Evolving and trying out certain techniques of improving C.T.A.

6. Comparative study of the creative thinking performance for primary school pupils.

7. Investigation into factors promoting C.T.A.


Correlated study of the different factors of creativity could also be undertaken and the results could be utilised for improving the C.T.A.
It has been observed that the C.T.A. is composed of different aspects of divergent thinking. As a behaviour component, a close look at the relationship between performance and C.T.A. would definitely reveal some facts which might be useful to teachers, pupils and teacher educators at large. Last but not the least, there is an urgent need of C.T.A. test for different age groups.

Thus, the field is vast and promising enough for further research. The present study is but a small step, and that too a humble one, in the direction.