CHAPTER-V

SUMMARY, CONCLUSION

&

RECOMMENDATION

5.1 Summary

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CHAPTER - V

SUMMARY, CONCLUSION AND RECOMMENDATION

The summary of all previous chapters have been presented in this chapter. The conclusions drawn on the basis of the results obtained and the recommendations formulated for future investigation have also been presented in this chapter.

5.1 SUMMARY

Human being starts life as a unicellular organism, without any nervous system. In course of development he becomes a multicellular organism. Along with bodily development of the human being, there is corresponding development in behavior. At birth, the behavior of the child is strictly inherited. It is of non-variable kind. But it becomes gradually varied (Verma).

Behavior is a mechanism of reflex which is highly related with mental process. From the childhood stage human being learns to behave according to the conditions (internal and external). And most learning process precedes motor processes i.e. we observe, think and act. All these observations, thinking ability and action largely depend upon the five sensory receptors viz ear, eye, tongue, nose and skin. The coordinated activities of all these five organs play a vital role to our normal life. Their basic needs played as the stimulus caused storage centre or memory drum to ‘play back’ the particular activity (Fox, 1981). This is such feeling that a person concerned is not always aware of it. It helps a person to react directly, systematically and according to the situation. The child learns by impulsion and compulsion, invitation and imitation and adaptation and assimilation. So learning cannot be categorized into physical and/or mental compartments. To categorize behavior into purely physical and/or mental compartments is to destroy the unity of organism. Some behavioral acts no doubt predominantly mental and others predominantly physical but neither is purely either (Kamlesh, 2002). However, for the sake of convenience and understanding of how behavioral transformations take place, psychologists categorize learning into cognitive, affective and motor types (Kamlesh, 2002).
Cognition covers every mental activity that is commonly regarded as "thinking or knowing, perceiving, recognizing, learning, conceptualizing, imagery, problem-solving, remembering, reasoning and judging" (Guinness, 1990). It is the ability of a person in the areas of problem-solving, concept-formation, reasoning and acquisition of knowledge through memory and/or understanding. This type of ability predominantly mental in nature – depends greatly on the brain process which deals with conscious awareness of the external environment and the acquisition of all kinds of knowledge.

Early in child’s life, the brain has many more cells (neurons) than the child would need (Allen and Marotz, 2010). Connections among neurons are formed as children explore their environment, play and develop attachment to others.

Wyrick (1968) defined the term as the combination of perceptions into new motor patterns. These perceptions could be a solution to a given problem or an idea which is expressed through movement. Another similar definition for motor creativity describes it as a children’s effort to produce movements that represent answers to motor stimuli or solutions to motor problems (Zachopoulou, 2007).

Although motor creativity may be communicated in completely different ways from creativity in arts, it can be argued that it derives from the same cognitive mechanism. However, even if certain subjects are considered more suitable for enhancing creativity, it does not mean that the skills acquired in one subject can be transferred to others as well. For example, a person that manifests creativity in arts is not necessarily equally creative in science. If children learn the ‘fundamentals’ of being creative in an ‘environment’ more appealing to them such as movement programs, then possibly they can use this experience in other subjects too.

On the other hand a factor that is very much involved in movement and specially in learning specific skills is kinesthetic sense. Kinesthesia may be defined as the sense that gives the individual an awareness of position of the body or parts of the body as it moves through space (Barrow and McGee, 1979). Proprioceptors are nerve-ending connected to joints, muscles and tendons. Their stimulation comes from the movements of these body parts. Precisely, proprioceptors are those receptors which monitor kinesthetic sensations and keep the brain informed as to how the movement(s) is being performed.
Therefore, cognitive ability, motor creativity and kinesthetic sense are closely related with each other. Several research studies revealed that these qualities are governed by the psychomotor process of brain (mental & neurotical). It is believed that effect of cognitive learning, motor creativity (Tocci, Scibinetti and Zelli) and kinesthetic sense will be different on different pupil in respect of age. A mature individual will react more effectively after analyzing the stimulus whereas an adolescent is emotionally carried out and the reaction does not depend upon reasoning while a child neither analyses the stimulus nor is emotionally carried out and thus reacts differently.

Programs or activities that are considered more suitable for enhancing creativity in young children must enhance children’s intrinsic motivation and provide ample opportunities for various forms of play.

Play is a critical element in early childhood because it provides the context for experiences that are vital to the development of neural pathways. Children must have to practice and master the skills they have learnt before moving on to learning new ones, and learning must take place in a meaningful context and in an environment of love and support (Galinsky, 1997).

Play and Exercise should not be put away with one’s commencement gown and mortarboard when high school or college is finished—they are not solely the possession of youth. Regardless of sex and regardless of age, they should be part of one’s routine throughout life. They will supply many mental, physical, and social dividends which will contribute in great measure to a rich and full life (Bucher, 2008).

The purposes of the present study were as follows:

1. To observe cognitive ability of three different age groups of children.
2. To observe motor creativity of three different age groups of children.
3. To observe kinesthetic sense of three different age groups of children.
4. Intragroup analysis of these qualities will be conducted to find age specific characteristics, if any.
5. To observe the influence of exercises on children of different age groups in respect of cognition ability, motor creativity and kinesthetic sense.
6. To observe the relationship among these three parameters (cognitive ability, motor creativity and kinesthetic sense).
Review of related literature is an important ingredient of any thesis. Around eighty five research findings of leading researchers have been discussed in Chapter-II of this thesis.

The investigator designed Chapter-III with procedure which was adopted for taking various method and materials. The experiment was conducted on two primary schools. Sixty boys from each age group of 6 years, 7 years and 8 years of Mc William Primary School and Jitpur Primary School of Alipurduar subdivision of Jalpaiguri District, West Bengal, were selected as subjects adopting random sampling technique. All the subjects were assigned at random to one experimental group (N=30), and one control group (N=30) from each age group (6 years, 7 years and 8 years).

Standing height and body weight of all the subjects were measured. All the groups were administered tests for cognitive ability (Raven’s Progressive Matrices Test, Wisconsin Card Sort Test – manual adaptation and Academic Performance Test) motor creativity (A Motor Creativity Test Battery formulated by M.C.Ghsoh, 1991) and kinesthetic sense (Distance Perception Jump). Ten weeks chronic exercises program was employed to experimental groups (6 years, 7 years and 8 years). The data on cognitive ability, motor creativity and kinesthetic sense were collected after completion on ten week chronic exercise program.

The tests conducted according to the standard methods and the data obtained in each parameter were statistically analyzed adopting standard procedure. Each criterion measure was tested for significance by applying Paired t test and the level of confidence set up for significance was 0.05. The coefficient correlation was calculated to find out the relationship among the parameters.

The results obtained were presented in tabular and graphical form in the text in Chapter-IV. It was evident that after ten weeks chronic exercise program the entire experimental group proved to be more efficient in terms of cognitive ability, motor creativity and kinesthetic sense. Results of each parameter were discussed in length in the text and summary of discussion are furnished here in following paragraphs parameter wise.
Cognitive ability

The cognitive ability was different in respect of age. The 6 years age group was lesser than the 7 years of age group. But the 8 years age group was better than both the groups.

Mean gains of experimental group (6 years, 7 years and 8 years) were tested for significant differences by ‘t’ test. Mean gains made by all experimental groups were found statistically significant at 0.05 level of confidence. Only the mean differences in case of 7 years of age group the cognitive ability measured by the Raven’s progressive metric test was not statistically significant at 0.05 level of confidence. But the mean differences of pre test and post test of two other tests (Wisconsin card short test and Academic achievement score) were found statistically significant at 0.05 level of confidence. So it can safely be said that the chronic exercises has a positive effect for the development of cognitive ability. In case of control groups slight development of cognitive ability was also found. But that was not statistically significant.

Motor creativity

The motor creativity was also different in respect of age of the children. The 7 years age group was better than the 6 years of age group but the difference was not statistically significant. On the other hand 8 years of age group was better than the 7 years and 6 years of age group in relation to motor creativity which was statistically significant.

Post tests result of the experimental groups show that there was a statistically significant difference in comparison to the pre tests result. But the mean differences of pre tests and post tests result of control groups who did not receive the treatment of chronic exercises also developed this performance parameter which was not statistically significant. It is proved that the chronic exercise had an important role to develop motor creativity of children of 6 years, 7 years and 8 years of age group.

Kinesthetic sense

The study revealed the fact about kinesthetic sense which shows that age group of 8 years was better than the age group of 7 years and 6 years of age group. And the age group of 7 years was better than the 6 years of age group in relation of kinesthetic sense.
The study also shows that the chronic exercise develops the ability of kinesthetic sense of different age group of children. The mean values of post tests result of experimental groups proved statistically significant difference than the mean values of pre tests of all different age groups. But control groups did not show the significant difference between pre test and post test results.

In case of relationship of all these three parameters, cognitive ability and motor creativity were positively related with each other for all the age groups which were statistically significant. On the other hand kinesthetic sense was negatively related with cognitive ability and motor creativity which was not significant in case of 6 years but significant in case of 7 years and 8 years of age groups.

After critical analysis of the results obtained from data of the present study and from the foregoing discussion it may be stated that experimental groups improved significantly in all parameters after ten weeks chronic exercise program. Therefore, it may safely be concluded that null hypothesis (H1-H6) mentioned earlier in this regard is rejected and H7 is partially accepted.

The summary on the findings have been systematically presented in Chapter-V. The conclusions that are drawn from the findings are presented in chapter 5.2.

**5.2 CONCLUSION**

Under conditions of the present study the results seem to conclude the following:

**5.2.1 Physical parameters**

a) **Height**

Three groups are significantly different from each other in their height, 8 years > 7 years > 6 years.

b) **Weight**

Similarly in case of body weight 8 years age group is heavier than the 7 years and 6 years and 7 years is heavier than the 6 years.
5.2.2 Cognitive ability

i) Cognitive ability of three age groups is different from each other.

ii) Higher the age group better is the cognitive ability.

iii) Following participation in chronic exercise program of the three groups improve their cognitive ability significantly, except the 7 years of age group does not show the significant improvement in case of Raven’s Progressive Matrices test.

iv) In respect of development of cognitive ability chronic exercise program has a positive effect of age group of 6 years, 7 years, and 8 years.

5.2.3 Motor creativity

i) Motor creativity of three age groups is different from each other.

ii) Higher the age group better is the motor creativity.

iii) Following participation in chronic exercise program of the three groups improve their motor creativity significantly.

iv) In case of improvement of motor creativity chronic exercise program has a positive effect of age group of 6 years, 7 years, and 8 years.

5.2.4 Kinesthetic sense

i) Three age groups are different from each other in respect of kinesthetic sense.

ii) Higher the age group better is the kinesthetic sense.

iii) Following participation in chronic exercise program of the three groups improve their kinesthetic sense significantly.

iv) Chronic exercise program has a positive influence on kinesthetic sense on these age groups.
5.2.5 Relationship of cognitive ability, motor creativity and kinesthetic sense

In case of 6 years of age groups the relationships of cognitive ability, motor creativity and kinesthetic sense are as follows:

a) RPMT is positively correlated with WCST, APT and Motor creativity which is significant but negatively correlated with kinesthetic sense which is not significant.

b) WCST is also positively correlated with APT and motor creativity but negatively correlated with kinesthetic sense which is insignificant.

c) On the other hand APT is also positively correlated with motor creativity but negatively correlated with kinesthetic sense which is not significant.

d) Motor creativity is negatively correlated with kinesthetic sense which is insignificant.

In case of 7 years of age groups the relationships among the parameters are as follows:

a) RPMT is positively correlated with WCST, APT and motor creativity which is significant but negatively correlated with kinesthetic sense which is significant.

b) WCST is also positively correlated with APT and motor creativity but negatively correlated with kinesthetic sense which is significant.

c) On the other hand APT is also positively correlated with motor creativity which is significant but negatively correlated with kinesthetic sense which is insignificant.

d) Motor creativity is negatively correlated with kinesthetic sense which is significant.
In case of 8 years age groups the relationships among the parameters are as follows:

a) RPMT is positively correlated with WCST, APT and motor creativity which is significant but negatively correlated with kinesthetic sense which is significant.

b) WCST is also positively correlated with APT and motor creativity but negatively correlated with kinesthetic sense which is significant.

c) On the other hand APT is also positively correlated with motor creativity which is significant but negatively correlated with kinesthetic sense which is also significant.

d) Motor creativity is negatively correlated with kinesthetic sense which is significant.

5.3 RECOMMENDATION

Considering the aspects of the present study following recommendations can be made and the present work has given sufficient indications as to what should be suitable aspects to be researched upon subsequently.

5.3.1 Recommendation for future investigation

The present study was conducted on subjects selected from one specific region only. To get more meaningful results similar studies may also be conducted on large number of subjects selected beyond the state jurisdiction from all over the country.

1. Future research projects of similar nature may be planned with pre-primary school children as subjects.

2. Similar studies may be conducted with girls as subjects.

3. Similar study may be carried out among subjects with various degree of mental retardation.
4. Comparable study may be taken up among school going girls and school going boys.

5. Similar nature of studies can be carried out using community base recreation program.

6. Similar nature of studies may be done a large scale taking physiological and anthropometric parameters as criterion measure.

7. Similar studies may also be conducted with other typical physical and climatic conditions may be considered in future investigation.

8. Comparative study may be undertaken between Indian and foreign children.

5.3.2 Recommendation for practical application

1. During Physical Education classes’ development of cognitive ability, motor creativity and kinesthetic sense should be duly emphasized.

2. Arrangement should be made for proper implementation of physical education programs for primary schools of different classes.

3. Proper planning and implementation of programs of physical education should be given importance in Primary to Higher secondary school timetable.

4. Trained Physical Education Teacher must be appointed in primary schools not only for the physical development but also for the development of cognitive ability of the children.

5. The need of exercise for improvement of health and fitness is well established. As a compulsory subject Physical Education must be introduced from the primary school level.