CHAPTER 9
APPRAISAL OF THE THESIS

9.1 SUMMARY

The GES is as old as the Vedas themselves (Govindashastry, Taittariyopanishat, 1.1. 1987). Therefore, its minimum date can be fixed to 3000BCE which is the minimum date fixed for the Vedas in recent years (Frawley).

According to the ancient scriptures education is an obligation for any citizen. It was considered a sin and crime if somebody did not send their children for education (Dutta, 2.39). Nobody was meant to be uneducated in the society (Krishnacharya, 1.6.8). There were no separate schools for rich and poor. The students did not pay the fees when they were being educated. They all sought alms and shared them with their Gurus. It was the responsibility of the whole society to spend for the education of the children. They paid their services to their Gurus. They all had uniformity in clothes. The common dress code was a white dhoti with a ‘Samit’ (a wooden stick) in the hand and also with a Moufüci (a belt) around their waist and also with a tuft on their head (Dutta, 2.49-55). With all these things equality was maintained among the children in Gurukula education. But after coming out of Gurukula the students used to offer donations to their Gurukula out of their earnings known as Gurudakshinā (Govindashastry). For the duration of their education, Gurukula students would leave their home and go to Gurukula for several years. No day-scholars were permitted in the Gurukula way of education. Students stayed with their Guru, not only learning theories and texts from him, but also learning values and virtues from his example. The education was mainly through hearing, not through writing and reading. This is not because writing and reading were not available, but because they were considered inferior to hearing. This system of education through hearing had the power to
develop cognition, intelligence and strong memory. It was more practical than theoretical. Even the examinations were mostly practical. Theory was only to support the practice. Both secular and sacred principles were taught. Sacred science was taught through the Vedas, while secular study included Āyurveda (Medical science), Dhanurveda (Science of missiles), Gāndharva (Aesthetic arts like music), Nāḷyaśastra (Art of dance), kṛṣiśāstra (Agriculture), Tarka (Logic), Nyāya (Laws of Nature), Vaiśeṣika (Atomic sciences), Śilpaśastra (Engineering), Arthaśāstra (Economics and commerce), Dharmaśastra (Ethics, law and order), Śikṣā (Phonetics), Vyākaraṇa (Science of grammar), Nirukta (Science of etymology), Jyotiṣa (Astrology and Astronomy) and Sāhitya (Literature).

After the early and later Vedic eras, Buddhism made great contributions to the field of education. The great ancient universities of India like Nālanda and Takṣaśila had strong Buddhist influence. Buddhism’s rich contribution was to the fields of philosophy, logic and even Yoga. But due to the influence of Buddhism in the field of education and its emphasis upon the principle of Ahimsā, Dhanurveda comprising martial arts and missile sciences got dropped from Indian education (Majumdar). Gradually, due to the influence of Buddhism, people started to lose interest in secular science, as the emphasis of Buddhism was more on renunciation, monastic life and monkhood (Raju).

Macaulay introduced into India the modern education system (MES) which was completely material and secular and lacked the higher spiritual dimension of natural law. Modern education can impose morality and virtue only as rules and instructions without explaining the real science behind them. Therefore, students educated under
MES lack higher dimensions of personality, rather they come under a very strong influence of materialism. They are taught to consider the whole of spirituality as superstition. Their highest goal is to get a good job to earn money.

But due to the hard work of great spiritual masters like Sri Ramakrishna, Swami Vivekananda, Sri Aurobindo and Swami Dayananda of Arya Samaj, people gradually started to recognize the true significance of Indian culture and spirituality. Gradually people are again recognizing the greatness of the Indian sciences like Yoga, Āyurveda, Siddha, Vedic Mathematics and Nyāya. They are slowly acknowledging the significance of Indian philosophies like Sāṅkhya and Vedānta. Nowadays many Indians and even foreigners wish to learn Indian sciences and arts systematically, and wish to live the holistic Indian way of life. They are now supporting the fallen GES which is slowly coming back with the support of those really interested in learning the Vedic way of life and Vedic sciences.

Today two kinds of Gurukulas are being regenerated. – 1. Purely conventional which teaching only the Vedas and other Śāstras and 2. Conventional with few additional modern elements. (Though their main focus is ancient Śāstras like Vedanta, Yoga, Nyāya, Vaiśeṣika and so on along with the Vedas, they also have a few modern sciences like computers and physics. (These include Veda Vijnana Gurukulam of Bangalore, Prabodhini Gurukulam of Shringeri to name but a few).

A few universities in India like SVYASA in Bangalore, and Devasamskriti in Haridwar represent a blend of the ancient spirituality of the east and modern science of the west. These universities are centered on spirituality at the core and include research topics like protocol design, calculations, measurements and analysis as crust.
The thesis’ study was conducted to assess the effect of the Yoga way of life and learning practiced in Gurukula system of education as compared to modern education system. Two groups of 49 male subjects matched for age, daily routine and socio-economic background were chosen from pre-selected groups with ages ranging from 11 to 13 years. Four psychological tests were used to assess the subjects – Performance Tests of Intelligence, Tests of Spatial and Verbal Memory, Tower of London Test, and Letter Cancellation Test.

i. Performance Tests of Intelligence- This is mainly to assess intellectual functions like
   a. Gathering and correctly using several different pieces of information (a function of the parietal lobe).
   b. Memory (a function of the temporal lobe).
   c. Making the decision (a function of the dorsolateral zone of the frontal lobe).
   d. Having emotional involvement (a function of the cingulate cortex of the frontal lobe).

ii. Tests of Spatial and Verbal Memory – This assesses verbal and spatial memory abilities (the main concern of the temporal cortex). Spatial memory is more contained in the right hemisphere while verbal memory is more related to the left hemisphere.

iii. Letter Cancellation Test – This is to assess sustained attention (a function of the denticular zone and the prefrontal lobe).

iv. Tower of London – This is to assess planning ability, (mainly the function of the Dorsolateral zone of the frontal lobe).

The present study showed that after one academic year of Yogic way of life and learning in the Gurukula system of education the GES group showed a significantly greater increase in cognitive functions than the control group. Within groups data
(before and after) were analyzed using the Wilcoxon test, while between groups data were analyzed using the Mann Whitney U test, which showed that between groups differences reached significance. After the one year learning period, the improvement of the Gurukula group was significantly better than that of the control group (P < 0.005, Mann-Whitney U Test).

9.2 CONCLUSIONS

9.2.1 This study on 49 boys in the age range of 11 to 13 comparing the Yoga-based Gurukula System of Education with Modern Education System has showed significant improvements in planning ability of students over one academic year.

9.2.2 The IQ test as assessed by Bhatia’s battery of Performance Tests of Intelligence have shown significantly higher improvements (28 to 48%) in GES compared to MES (11 to 23%) also showing statistical significance between groups.

9.2.3 The spatial and verbal memory scores showed between group significance (p<.001) showing 31 to 57% increase in GES compared to 20 to 29% in MES.

9.2.4 The attention span of students as measured by Six Letter Cancellation Test has shown higher improvements in GES (11 to 40%) compared to MES (4 to 6%) with between groups significance (p<.001 in the total, net and wrong scores).

9.2.5 The Tower of London Test used to assess the planning ability of students has shown between group significance (p<0.05) in all parameters. The planning and execution as also mean total time have shown 3 to 14% improvement in GES in comparison to 2 to 9% in MES. Mean moves show 5 to 12% in GES while 4 to 6% improvement in MES.

A critical review of the work done to assess the strengths and limitations of the study is presented below, together with insights for future research.
9.3 STRENGTH OF THE STUDY

9.3.1 This is the first study of its kind taken up to examine with an open mind the usefulness of traditional Indian Yoga based educational system (called Gurukula system) in comparison to MES.

9.3.2 While RCT is the gold standard design which is not applicable in this type of investigation, matched control trial (MCT) for one academic year is the next acceptable standard design used in this study. The one to one matching of each student for socio-economic status adds to the strength of the study apart from other matching parameters.

9.3.3 All assessments used in this study are standard tests, applicable to Indian students.

9.3.4 The highly significant between group results showing a clear edge of GES over MES disproving the null hypothesis is yet a great strength of this study.

9.4 LIMITATIONS OF THE STUDY

9.4.1 The sample of students restricted to males, age range of 11 to 13 as also the study restricted to residential set up is a very narrow window to claim generalization and the useful adoption of GES over MES.

9.4.2 Data was not collected about the practices of Yoga, during the break at the time of holidays. Two more data before and after the holidays would have added greater strength to the study.

9.4.3 Quantitative measures related to cognitive variables as EEG, Brain wave coherence, EP, fMRI on one hence and studies of neurotransmitters, biochemical parameters, physiological variables as GSR, MR etc on the other, would be needed to understand possible mechanisms involved in GES as compared to MES.
9.4.4 This study has only assessed the students twice, at the beginning and end of the academic year. No periodical assessments were conducted. Therefore, the study did not evaluate immediate effects of GES. Also, it is not a long-term study covering the whole time span of GES.

9.4.5 The study did not include the evaluation of how Gurukula students utilize their skills in normal life after completing their education.

9.4.6 A survey conducted among the Indian students (Danino) suggests that girls appear more interested in Indian culture as well as more aware of it. Perhaps, a study conducted among the girl students, might have provided better results.

9.5 SUGGESTIONS FOR FUTURE

9.5.1 The study could lead to more detailed investigations at all levels of school and collegiate education. Multi-centered trials, larger span of age of students, inclusions of girls would be warranted to generalize the favorable results found in this study.

9.5.2 Correlations with Indian- personality Inventory (measures of guṇas – Tamas, Rajas and Sattva), emotional parameters such as Emotional intelligence and competence would add new dimensions to evaluate all round personality development of students in both systems.

9.5.3 Adoption of selected Yoga techniques used in GES to be included in the MES to conduct a 3 arm study (MES with and without Yoga techniques and GES) in residential and non residential set ups with larger number of students which can be of great value to spread the traditional Yoga-based education system in MES.

9.5.4 This study has shown evidence of greater improvements in cognitive abilities in GES compared to MES disproving the null hypothesis that GES can at best bring the
same changes as MES in boys in the age group of 11 to 13 years over one academic year (10 months) paving way for possible adoption of Yoga techniques and the Yoga way of life in education system.