CHAPTER V

SUMMARY CONCLUSIONS AND RECOMMENDATIONS

5.1 SUMMARY

In today's world, sports play an important role and millions of people participate in it. Many countries have recognized the importance of an effective sports training program in a wide range of activities not only for the success in major international competitions but also for the development of healthy participation. Research has revamped the whole concept of sports. The field of sports is currently undergoing remarkable scientific changes. Highly technological innovations through contributions from various disciplines made the sports field more authentic, glamour and appealing.

The present century is rightly technological due to the influence of advancements in the field of science and technology on the varied aspects of life, resulting in its modernization. The impact of scientific and technological advancements in sports is so great and which has given rise to the new discipline called sports technology.

The path of science and innovations has under gone remarkable changes during the past couple of decades and has caused the growth of science based industries such as information technology, space technology, biotechnology, sports technology etc. Coaches and sports scientists are more dependent on modern and scientific technology to derive top quality

performance from their athletes. Technology has revolutionized coaching and training. It has come to the stage, that the enrichment in using technology and its process has attained a multidimensional approach, using ultra technological devices. The influence can be felt in selecting suitable strategy and positions of players before and during the game.

Now a day's mostly timings are recorded for track events in national, state, university and district level meets by manually operated stop watches. It may not be very accurate, as watches are operated by human beings. The accuracy is based on the operating ability, reaction time, observation sensitiveness, environmental factors and Psychological aspects of the timer. Every individual is not having same operating ability and it will reflect on the time recorded too. To avoid such error electronic device can be used, to ensure starting and finishing technique, time accuracy and precision tendency to measure the timings of athletes. This motivated the investigator to construct and standardize a computer oriented electronic device to record the performance and its related variables of the sprinters.

The purpose of this study was to construct and standardize a computer oriented electronic device for the assessment of performance and related variables of sprinting event.

Significance of the problem are:

- The contribution of the present study is construction and standardization of computer oriented electronic device to assess the performance and related variables of sprinters.
- The newly constructed electronic device would be useful to record and provide accurate reaction time of 100m sprinters from starting position on the track.
- The newly designed electronic device would be helpful to record and provide accurate 20m split time at different five phases during training and competition.
- The device would be useful to record the speed performance of 100m sprinters
- From the point of view of coaches, this equipment would be of great value to assess the performance related variables of sprinters, accurately and to design the training schedule accordingly.
- The judges of sprinting events can use this electronic device for officiating in standard sports meet for precision assurance.
- It can minimize the use of officials and stopwatches while officiating sprinting events.
- It educates and enables the sprinters to know their sprinting ability at various phases and modify their training program to the requirements felt.
- The findings of the study would motivate the sports technology experts to construct a sophisticated computer oriented electronic device to assess

the performance variables of athletes participating in running, jumping, and throwing events.

- The results of the study would be of great significance to the body of knowledge in the field of sports technology in general and technology for sprinters in specific.

The review of literature is instrumental in selection of the topic and it provides understanding of the problem in depth. The research scholar has gone through numerous relevant literatures. Based on the purpose of the study, the reviews has been classified in to eight areas such as a) studies related to automatic timing assessments, b) studies on photo finishing technology, c) studies pertaining to standardizing the device, d) studies on assessing the long distance events using advanced technology, e) studies related to assessing the long distance events using laser technology, f) studies on radar technology in sports field, g) studies associated with advance technology devices in sports field, h) study related to infrared technology in sports field.

In order to achieve the purpose of the study, two hundred male athletes who participated in the Anna University Intercollegiate Athletic Meet held at Coimbatore were selected. Among them one hundred and twenty athletes were randomly selected as subjects by lot method and their age ranged between 18 to 25 years.

Resorting from the review of literature, discussion with experts and considering the feasibility, the following variables are selected.

1. Reaction time from the sprint starting position on the track.

2. 20m split time

   a. Starting point to 20m

   b. 20m to 40m

   c. 40m to 60m

   d. 60m to 80m

   e. 80m to 100m

3. Speed.

One hundred and twenty subjects were randomly selected by lot method and divided into fifteen equal groups, each consisting of eight members. To all the 120 subject's the reaction time from starting position on the track, 20m split time at different five phases and speed performance were assessed simultaneously for eight athletes by using the newly constructed computer oriented electronic device. Hence, random group design was followed in this study.

To assess the 100m sprinters reaction time, eight starting blocks were used. All the starting block's rear side is fixed with a special micro switch and its

output terminals of each switches are connected with the computer via interfacing unit for appropriate function.

At the starting point of each lane, 8 athletes were directed to run 100m straight sprint in a 400m mud track with crouch starting position. To start the race, starting gun attached with condenser microphone was used, when the gun was triggered the sound was observed by the microphone and sent the signal to microcontroller instantly to start all the 8 timers in the computer and it was flashed in the computer monitor. On hearing the gun sound, the athletes kicked the starting block to commence the race, while the special micro switches observe the movement and sent a signal to interfacing unit to stop the timer. Every athlete's response, corresponding timer unit seized and it was recorded in microseconds. These recorded times are the reaction time of sprinters from starting position on the track.

In order to assess the 20m split time at different five phases, the Infrared transmitters of the electronic device were placed at 20m, 40m, 60m, 80m and 100m of the track in every lane. The IR receivers also fixed over the IR transmitter in a straight line, at eight feet height. The power fed to IR module, the IR rays emitted in a straight line from IR transmitter to the corresponding IR receiver with streamlined injection. The gathered rays by the IR receivers are converted as electrical signals and constantly transmitted to the interfacing unit. The interfacing unit encoded the received signals and sent them to the computer to coordinate with the corresponding timer to analyze and record the result. These results had shown the 20m split time at various five phases.

On hearing the gun sound the athletes started 100m and instantly timer of electronic device started in all eight tracks and flashed in the computer monitor. When the athletes crossed the 20m, 40m, 60m, 80m and 100m, the constantly emitted IR rays got interrupted. The interruption instantly got converted as data signals by IR receivers and these signals were gathered by the micro control at interfacing unit and it sent them to the computer in the form of a special computer code language, to coordinate with special software which is already installed in the computer. Hence, the timer in the computer also instomatically stops, so does for every athlete also. By the above said method the athlete's 20m split time for five phases were assessed. These recorded times are the 20m split time of starting to 20m, 20m to 40m, 40m to 60m, 60m to 80m and 80m to 100m, of 100m sprint.

To assess the speed of 100m sprint, on hearing the gun sound, the athletes started the 100m race and instantly timer of the electronic device started in all eight tracks and flashed in the computer monitor. While they crossed at 100m finishing line, the constantly emitted IR rays got interrupted. The interruption instantly got converted as data signals by IR receivers and these signals were sent to the computer in the form of a special computer code language. This signal stops the timer in the computer instomatically, so does for every athlete also. By the above said method the athlete's 100m performance was assessed simultaneously for eight athletes.

In this study, at a time eight athletes were directed to run 100m straight sprint on a 400m mud track in crouch starting position. In the same way 15 batches of

each eight athletes, (15x 8=120) completed 100m sprinting. Further, at the interval of two days for recovery, the athletes were directed to run 100m second time by following the same procedure.

When the athletes ran 100m for the first time, the first tester assessed reaction time, 20m split time at various phases of , a) from starting point to 20m, b) 20m to 40m, c) 40m to 60m, d) 60m to 80m and 80m to 100m and 100m sprint performance of atheletes using the newly constructed electronic device. Simultaneously all the above said variables were also assessed by adequate number of timers using stopwatches.

Howere, the timers were unable to assess the reaction of atheletes as it is not possible to record the same using the stop watches. When the athletes ran 100m for the second time the same first tester was collected the data for above said variables using the device. When the atheletes ran 100m for third and fourth time all the above said variables were assessed separetly by second and third testers using the newly constructed electronic device by following same procedure. During second, third and forth testing periods all the data were assessed by using the new device alone.

The data were collected from the atheletes during different four testing periods. Further, reliability, validity and objectivity were establised by using the appropriate data. To establish reliability, test re-test were conducted by using the newly constructed electronic device. ANOVA and Intraclass Correlation(R) was computed separetely for each variables as suggested by Thomas and Nelson (1996).

In order to establish valididy,tests were conducted by using the newly constructed electronic device and stop watches simultaniously. The collected data were treated by calculating Peasrson Product Moment Correlation separately for each variables.

With a view to establish objectivity, three testers were used to assess the variables by using the newly constructed electronic device at three different periods. ANOVA and Intraclass Correlation(R) was computed separetely for each variables as suggested by Thomas and Nelson (1996).

In all cases, the level of significance was fixed as 0.01.

5.2 CONCLUSIONS

1. The newly constructed electronic device is reliable, valid and objective to assess the reaction time of the sprinters on the track from starting position, simultaneously for eight athletes.

2. The newly constructed electronic device is reliable, valid and objective to assess the 20m split time at various phases of a) from starting point to 20m, b) 20m to 40m, c) 40m to 60m, d) 60m to 80m and e) 80m to 100m simultaneously for eight athletes.

3. In addition, the newly constructed electronic device is reliable, valid and objective to assess the speed performance of 100m sprinters, simultaneously for eight athletes.

4. To record the 20m split time at different five phases of 100m sprinting event for eight athletes, 40 timers and stopwatches are required. While a single newly constructed device is able to record the split timings very accurately for eight sprinters simultaneously. It leads to economy of finance and time. Further the new device is easy for administration, scoring and interpretation. Thus, the device is possessing administrative feasibility.

5. It is not possible to assess the reaction time of sprinters on the track from starting position by using stopwatches, while the new device assess the same accurately and simultaneously for eight sprinters. Further, the coaches, judges and athletes can use this device for the accurate assessment of 20m split time of 100m sprinting event at five different phases and speed performance of 100m sprinters. Hence, this device is possessing educational applications.

6. The newly constructed electronic device possesses the scientific authenticity such as reliability, validity, objectivity, administrative feasibility, and educational applications. Hence, the new device can be used to collect the data for research purposes in addition to training, testing and officiating. Hence, this device is possessing research applications too.

5.3 RECOMMENDATIONS

It is found in this study that the newly constructed electronic device is reliable, valid and objective to assess the reaction time from starting position on the track, 20m split time at various phases of a) from starting point to 20m, b) 20m to 40m, c) 40m to 60m, d) 60 to 80m & e) 80m to 100m and the speed performance of 100m sprinters, simultaneously for eight athletes.

Based on the conclusions of the study, the following recommendations are made.

1. The coaches who train the sprinters can use this device to record the speed performance & relative variables and to make qualitative analysis of sprinters.

2. When two or more sprinters are crossing the finishing line at near the same time, through the naked eye, the discrimination between the competitors may not be able to decide by the judges.

   Under such circumstances, this device is more helpful for the judges of sprinting events to record the timings accurately and to select the medalist correctly.

3. It is recommended that the sprinters can use this device to know their speed performance and related variables to modify their training schedule accordingly.

5.4 SUGGESTIONS FOR FURTHER RESEARCH

Based on the problem of the study, the following suggestions are made.

1. Research is necessary to construct a similar device to assess the speed performance and related variables of 200m and 400m sprinters.

2. Similar research is essential to construct a device to assess the stride length and stride frequency of sprinters of different events.

3. Further research may be conducted to construct a device to assess the performance of jumping and throwing events.

4. Special equipment may be devised to assess the performance and related variables of aquatic activities such as swimming, diving, water polo, etc.

5. Such a device can be made with wireless technology.

6. Experts in sports technology can make an earnest approach to construct different devices which are useful for Physical educationists, coaches, and athletes for training, testing and officiating purposes.