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A Study Of Improvement In Skill Acquisition And Performance In Batting Among Female Cricketers

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Abstract

The present study is based on the effectiveness of a six-week training program regarding skill acquisition and batting performance in women's cricket at Visva Bharati University. Twenty female cricketers at university level between 18 to 25 years of age were randomly assigned to an experimental group and a control group. The experimental group underwent a 6-week training program focused on refining the batting techniques through a combination of technical drills, video analysis, and feedback sessions. The control group, however, continued with their usual ways in exercise. The batting skills in each group were measured at baseline and after training using standard tests and video analysis for grip, stance, back lift and shot accuracy. The performance measures were compared involving pre- and post-training assessment by analysis: descriptive statistics were expressed in mean and standard deviation, and t-test performed in confidence interval of 0.05. The statistical analysis of results in all the tested batting techniques revealed the experimental group made statistically significant progress compared to the control group. Improvement was significant in grip stability, stance balance, backlift adjustment, and shot execution accuracy. From a positive perspective, the structured training program did enhance the participant's batting technique, thus clearly indicating the necessity for technical interventions in a targeted manner for superior cricket performances.

Key Words: Kinematic Analysis, Batting Technique, Skill Acquisition, Experimental Group, Training Programme

1.0 Introduction

The tag 'cricket' is derived from the Old English word 'crys,' which means a small stick or staff, and the suffix '-et', which usually describes something small. Indeed, this name rightfully describes what the central tool of offense in the game is: the bat. It is played by two elevens pitted against each other on a 22-yard pitch. Therefore, cricket can claim to offer a rich cocktail of skills that involve batting, bowling, and fielding, all of which are governed by complex rules and regulations. Having its origins in England, history goes back to at least the 13th century, proven by historical records and even Edward I's diary that talks of a game having taken place in Kent. It was in 1709 that the first documented cricket match had occurred between London and Kent, signalling the start of cricket as an official form of competition. A few other milestones included the formation of the Hambledon Club in 1760 and the Marylebone Cricket Club (MCC) in 1787. The real internationalization of this sport began when the first Test match between Australia and England was played in 1877, which finalized the international cricketing body—International Cricket Council. (ICC) in 1909, renamed in 1965 even led to more structure in the world game. In 1971, One Day Internationals (ODIs) were introduced to the world stage, and four years later saw the first Cricket World Cup. In fact, it is also in line with the trend of development that has occurred within cricket, which is in reference to coaching and player development. For instance, Velden and David (2010) carried out a study related to a perceptual-motor training program that sought to develop the visual focus and attention of university club cricket players. The three-step decision training model revealed significant improvement in batting performance and coincident anticipation times for the intervention group. In one such research work, by Campher, J. (2008), cricket and soccer players had been recruited for evaluating the effects of visual skills training, with an emphasis on hand-eye coordination and perceptual-motor skills which can be

sharpened up to provide a better performance. In fact, online coaching—by far, at least in the era of COVID-19—is no exception. One such study was conducted by Lahiri and Thander (2020) on the value of a 4-week online coaching module about batting setup and front foot shots, with remarkable improvement in the experimental group as against a control group. This is evidence to show that with online coaching modules, we can refine cricket technique.

In contrast, applied practice in cricket has seen much slower translation of motor control and skill acquisition research. For instance, Lascu et al. (2021) urge the use of knowledge based on research for developing practice environments. Additionally, biomechanical studies like those of Messier and Owen (1985) and Robert et al. (2014) all reveal the physical components of batting and fielding, which underscore the fact that the dictates of dynamics and dynamism are of prime significance for optimal performance. As cricket evolves at a pace, it becomes an absolute necessity to learn and apply scientific knowledge into the training process and strategy development.

The current research is bridging the gap between theoretical knowledge and practical application because this study has evaluated the effects of structured training programs on batting techniques which will be useful both for the player and coaches.

1.1 Statement of the Problem

This research was intended to establish the impact of a six-week training programme on skill acquisition and performance in batting among female cricketers of Visva Bharati University.

1.2 Objective of the Study

a) To identify differences in skill accuracy before and after training.
b) To assess the improvement in performance of the cricketers after training.

2.0 Methodology

2.1 Selection of Subjects

Twenty female university-level cricketers aged 18–25 were selected from Visva Bharati University. They were randomly divided into an experimental group (received training) and a control group (no training).

2.2 Selection of variables:

Selected batting phases were followed:

1. Stance
2. Bat Backlift
3. Placement of front foot
4. Impact
5. Follow through

2.3 Criteria system for evaluation by three judges

The front foot cover drive technique was evaluated by three expert judges of C.A.B. and Bolpur, Santiniketan, using a 10-point rating scale for stance, backlift, front foot placement, impact and follow-through.

2.4 Study design

The experimental design used in this study was a pretest-posttest design. Subjects were randomly divided into an experimental group and a control group. The experimental group underwent a progressive batting intervention programme, while the control group continued their regular cricket training sessions. The programme runs for six weeks, with sessions held three days a week, each lasting 60 minutes.

2.5 Methods of Data Collection

a) Participants: Data were collected from women's cricket team of Visva Bharati University.
b) Permission: Permission was obtained from coaches, managers and relevant authorities before data collection.
c) Instructions: Subjects received necessary instructions before the proficiency test.
d) Group Assignment: Players were randomly selected and divided into experimental and control groups.
e) Filming: Cameras were placed on tripods at a distance from the wicket (45 feet for front view and 29 feet for side view) at a height of 5 feet from the ground.
f) Data Collection on Performance: Data collection was done through subjective rating form prepared by a Coach accredited by N.C.A and B.C.C.I Level-A, as well as MSDCA Level-I. The focus was on cover drive, position assessment, backlift, front foot placement, and impact.
g) Expert Rating: Three experienced coaches and cricket experts' accreditation from N.C.A and C.A.B rated the batting technique of the players for both experimental and control groups.

2.6 Filming Protocol

To capture kinematic variables relevant for analysis, subjects were filmed using two digital video cameras. Both cameras were mounted on tripods, positioned at fixed distances from the wicket: the front view camera was placed 25 feet away, while the side view camera was placed 20 feet away from the wicket. The height of both cameras from the ground was calibrated to 5 feet to ensure consistent framing of the subject. This setup allows for a comprehensive capture of batting mechanics from both frontal and lateral perspectives.

2.7 Coaching module/protocol - experimental intervention group

The experimental intervention group followed a structured coaching module, developed by a BCCI-NCA accredited Level-A coach and MSDCA Level-I coach. The module consists of the following steps:

- Warm-up: Conducted by a trainer or coach to prepare players physically and mentally.
- Skills Session Introduction: The session started with a brief introduction of the skills and drills to be practiced.
- Demonstration: The instructor or a designated demonstrator has demonstrated the skill development.
- Player Practice: Players are engaged in practicing demonstrated skills for a minimum of 10 minutes.
- Feedback: The coach observes the players and provides targeted feedback on areas of need for improvement.
- Re-practice: Players resume practice incorporating the feedback provided.
- Information management: The coach ensured that the session avoided information overload and was manageable for the players.
- Hydration: Regular water breaks were provided to maintain player hydration and performance.
- Cool Down and Summary: Each session concludes with a cool-down period and a summary of key points and progress.

2.8 Batting Drills

To improve the batting technique effectively, a range of specific drills were employed:

1. Stance Drills:
- Position in three counts.
- Position in four digits.

2. Back-Lift Drills:
- Pick up one hand.
- One hand pick up and one hand drive.

- One hand picks up and two hand drive.
- Pick up with both hands.
- Two hand pick up and two hand drive.

3. Front Foot Placement Drills:

- Place the front foot in line with the markers.
- Place the front foot pointing towards the covered area.
- Fixed ball drill.

4. Impact Drills:

- Front foot shadow drill.
- Front drive with fixed ball drill.
- Front foot drive with drop ball drill.
- Front foot drive with moving ball drill.

These drills were designed to address key components of the batting technique, including stance, back-lift, front foot placement, and impact, aiming to improve overall batting performance.

2.9 Statistical Techniques

Descriptive statistics and T-tests were used to analyse pre- and post-training data, with a significance level set at 0.05.

3.0 Analysis and Interpretation of Data

The present study aimed to assess the effectiveness of an intervention programme on batting performance variables between an experimental group and a control group. The collected data were analysed using descriptive statistics and T-tests, with the level of confidence set at 0.05 to test the significance. The rate of change was calculated using the percentage method.

Table 1

Descriptive Analysis between the Experimental and Control Group during Pre-test & Post-test

Group	Pre-test Mean	Pre-test SD	Post-test Mean	Post-test SD
Experimental Group	5.5	1.900	6.6	1.712
Control Group	4.8	1.229	3.9	1.197

Summary of the table:

- The mean pre-test score for the experimental group was 5.5, while the control group had a mean pre-test score of 4.8.
- Post-test mean scores were 6.6 for the experimental group and 3.9 for the control group.
- Standard deviation (SD) values show variability within each group for both pre-test and post-test scores.

Table 2

Mean, Standard Deviation & P-Value of Batting Technique of Experimental and Control Group before and After the Programme

Sl.no	Groups	Pre-Analysis Rating Score Mean ± SD	Post-Analysis Rating Score Mean ± SD	t-Value
1	Experimental Group	5.5 ± 1.900	6.6 ± 1.712	0.0067
2	Control Group	4.8 ± 1.229	3.9 ± 1.197	0.0038

Significant at 0.05 level (t=2.262)

Summary:

- The mean pre-analysis rating scores were 5.5 for the experimental group and 4.8 for the control group.
- Post-analysis mean scores increased to 6.6 for the experimental group, while they decreased to 3.9 for the control group.
- Statistically no significant improvements were observed in the experimental group, with a t-value of 0.0067, compared to the control group.

Rate of Improvement

Table 3

Percentage Improvement in Batting Technique for the Experimental Group

Sl.no	Group	Pre-Analysis Rating Score Mean ± SD	Post-Analysis Rating Score Mean ± SD	Percentage Improvement
1	Experimental Group	5.5 ± 1.900	6.6 ± 1.712	20%

Summary:

- The experimental group showed a 20% improvement in batting performance after the intervention programme.

Table 4

Comparison of Batting Technique between Experimental and Control Group after the Coaching Programme

Sl.no	Category	Experimental Group Mean ± SD	Control Group Mean ± SD	t-Value
1	Coached	6.6 ± 1.712	3.9 ± 1.197	0.008

Significant at 0.05 level (t=2.119)

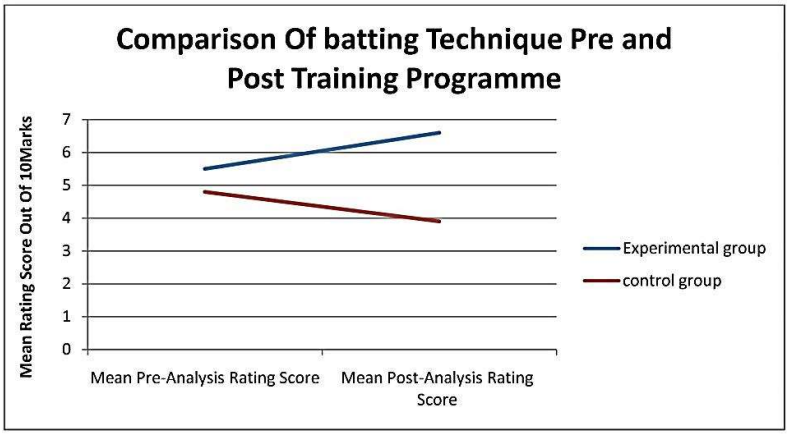
Summary:

- The post-analysis mean rating score for the experimental group was 6.6, while it was 3.9 for the control group.
- The t-value of 0.008 indicates statistically insignificant improvement in the experimental group's batting technique compared to the control group.

Graphical Representation

Figure 1

Graphical Representation of Batting Technique between the Experimental and Control Group after the Training Programme



Summary:

The graph clearly depicts the post-intervention improvement in the batting technique of the experimental group compared to the control group.

DISCUSSION OF FINDINGS

The primary objective of this study was to evaluate the effect of a six-week training programme on skill acquisition in batting performance. The results reveal nuanced insights into the effectiveness of such interventions.

Improvement of batting technique

The results indicated that there was a noticeable improvement in the batting technique of the experimental group, which was reflected in the mean scores. The mean pre-test score for the experimental group was 5.5, which increased to 6.6 at post-test. It was a decrease too in the mean score of the control group from 4.8 to 3.9. This mean score, however, is still high in comparison with the pre-test means, but improvement was not statistically significant. This is then an indication that though training positively influenced their scores, the effect was modest.

Constraints and Influencing Factors

There can be several reasons for such a modest and statistically non-significant improvement in the score. The most significant reason is that of training period. Six weeks are not enough to achieve a statistically significant difference in batting technique and other skills that require high precision and muscle memory. As suggested in the previous sections, rational and long enough practice duration is essential to master skills. This has been evidenced in some pieces of research such as those by Fujita et al. (1991) and Long et al. (1991). The sample size under study is insufficient for analyzing results conclusively. Small sample size may lead to high variability, hence less reliable results and difficulty in detecting significant change. On top of that, inadequate equipment may hinder the effectiveness of training methods. Advanced sports training equipment and technology are normally very important determinants since they help to offer detailed feedback and be able to make accurate adjustments (Wimshurst, Z., Sowden, P. T., & Cardinale, M. (2018)).

Comparison with previous studies

The results of this study would concur with previous research that suggested sport-specific training programmes might be effective among skilled athletes. Wimshurst, Z., Sowden, P. T., & Cardinale, M. (2018); Kofsky and Starfield (1989) had shown that effective training enhanced the sport-specific skills of skilled players. The results may therefore imply that performance may be potentially cultivated through repetition and specifically directed training. Another conclusion that may be drawn is the fact that, if the online coaching module used in this study was successful in improving batting technique, structured training programmes do achieve outcomes. In contrast, Abernethy and Wood (2001) concluded that no improvement in visual or tennis skills was observed after generalization. This discrepancy can be attributed to the novice status of the programme participants and lack of prior experience. Beginners usually need to develop more basic skills before they can benefit from specialized training.

Implications and future directions

The results suggest that while the training programme has a positive effect, extending the duration and incorporating more advanced equipment may increase its effectiveness. In addition, future studies should consider larger sample sizes to improve the reliability and generalizability of the results. For beginners and transitioning players, technical skills should not be seen as a limiting factor for good performance. Instead, consistent and repetitive training combined with a targeted coaching approach can lead to significant improvement. This study reinforces the value of appropriate training programmes and suggests that even short-term interventions can provide benefits, although more extensive programmes may be needed for significant gains.

Conclusion

Based on the findings and limitations of the study, it is concluded that a six-week training programme resulted in statistically insignificant improvement in batting technique among university-level female cricketers. Mean scores indicated a slight improvement, suggesting that the drills used had some positive effect, although not significant.

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