

**PLYOMETRIC TRAINING MODEL FOR ELITE
VOLLEYBALL ATHLETES IN SHANDONG PROVINCE**



**ZHANG XUE
9904923041**

A Dissertation Written to Fulfil Part of the Requirements
for a Doctoral Degree

**POSTGRADUATE
UNIVERSITAS NEGERI JAKARTA
2026**

**PERSETUJUAN DEWAN PENGUJI DIPERSYARATKAN UNTUK
UJIAN TERBUKA/ PROMOSI DOKTOR**

Promotor

Co-Promotor

Prof.Dr. Nofi Marlina Siregar,M.Pd.

Susilo, D.Ed.

Tanggal:

Tanggal:

NAMA

TANDA TANGAN

TANGGAL

Prof.Dr. Dedi Purwana E.S., M.Bus.
(Ketua)¹

Prof.Dr. Widiastuti,M.Pd.
(Sekretaris)²

Nama : Zhang Xue

No. Registrasi : 9904923041

Program Studi : Physical Education

Tgl. Lulus :

¹) Direktur Pascasarjana Universitas Negeri Jakarta

²) Koordinator Prodi S3 Pendidikan Dasar

**PERSETUJUAN HASIL PERBAIKAN
UJIAN TERTUTUP**

No.	Nama Dosen	Tanda Tangan	Tanggal
1.	Prof.Dr. Dedi Purwana E.S., M.Bus (Ketua)		
2.	Prof.Dr.Widiastuti,M.Pd. (Sekretaris)		
3.	Prof.Dr. Nofi Marlina Siregar,M.Pd. (Promotor)		
4.	Susilo, D.Ed. (Anggota)		
5.	Dr. Aan Wasan, M.Si (Anggota)		
6.	Dr. Sugiharto, M.Kes. (Anggota)		
7.	Dr.Didik Purwanto,S.Pd.,M.Pd. (Penguji Luar)		

Nama : Zhang Xue

Nomor Registrasi : 9904923041

**PERSETUJUAN HASIL PERBAIKAN
UJIAN TERTUTUP**

No	Nama	Saran Perbaikan	Letak Tindak Perbaikan	Paraf (ACC)
1.	Prof.Dr. Dedi Purwana E.S., M.Bus (Ketua)	-Research methods used in the article	Chapter 3: Psges: 64,68, 105	
2.	Prof.Dr.Widiastuti,M.Pd. (Sekretaris)	-Multiple combinations of training models	Chapter 3: Psges: 78,102,116	
3.	Prof.Dr. Nofi Marlina Siregar,M.Pd. (Promotor)	-Training model images of closed clothing	Psges: 103-110	
4.	Susilo, D.Ed. (Anggota)	-Journal Acceptance Notice	Psges: 127,134	
5.	Dr. Aan Wasan, M.Si (Anggota)	-Data analysis situation	Psges: 127	
6.	Dr. Sugiharto, M.Kes. (Anggota)	-Data analysis situation	Psges: 130,135	
7.	Dr.Didik Purwanto,S.Pd.,M.Pd. (Penguji Luar)	-Use of research methods	Psges: 66,68	

Judul Disertasi :

Plyometric Training Model For Elite Volleyball Athletes In Shandong Province

Nama : Zhang Xue
No. Registrasi : 9904923041

SURAT PENYATAAN

Saya yang bertanda tangan di bawah ini :

Nama : Zhang Xue
NIM : 9904923041
Jenjang : S3 (Doctoral)
Program Studi : Physical Education
Angkatan : 2023
Semester : 121 (Odd) Academic Year 2026

Dengan ini menyatakan bahwa persetujuan ujian terbuka dan perbaikan ujian tertutup untuk pemberkasan yudisium dan wisuda adalah benar tanda tangan dan sudah mendapatkan persetujuan oleh komisi penguji. Apabila saya melanggar pernyataan ini, maka saya bersedia menerima sanksi dari Pascasarjana Universitas Negeri Jakarta.

Demikian surat pernyataan ini saya buat dengan sebenar-benarnya dan tanpa paksaan dari pihak manapun.

Jakarta, 21 April 2026

Yang membuat pernyataan,



Zhang Xue

LETTER OF ORIGINALITY OF SCIENTIFIC WORK

The undersigned:

Nama : Zhang Xue
Student ID (NIM) : 9904923041
Place and Date of Birth : China / 24 November 1986
Program : Doctoral Program (S3)
Study Program : Physical Education

I hereby declare that the dissertation entitled "Plyometric Training Model For Elite Volleyball Athletes In Shandong Province" is my own original work, contains no plagiarism, and all sources, both quoted and referenced, have been correctly stated. This statement is made consciously and without any coercion from anyone. If any irregularities or inaccuracies are found in this statement in the future, I am willing to accept academic sanctions in accordance with the applicable regulations at the Postgraduate Program of Jakarta State University.

Jakarta, 21 April 2026



Zhang Xue



KEMENTERIAN PENDIDIKAN TINGGI, SAINS DAN TEKNOLOGI
UNIVERSITAS NEGERI JAKARTA
PERPUSTAKAAN DAN KEARSIPAN

Jalan Rawamangun Muka Jakarta 13220

Telepon/Faksimili: 021-4894221

Laman: lib.unj.ac.id

**LEMBAR PERNYATAAN PERSETUJUAN PUBLIKASI
KARYA ILMIAH UNTUK KEPENTINGAN AKADEMIS**

Sebagai sivitas akademika Universitas Negeri Jakarta, yang bertanda tangan di bawah ini, saya:

Nama : Zhang Xue
NIM : 9904923041
Fakultas/Prodi : Pendidikan Jasmani
Alamat email : 24717232@qq.com

Demi pengembangan ilmu pengetahuan, menyetujui untuk memberikan kepada Perpustakaan dan Kearsipan Universitas Negeri Jakarta, Hak Bebas Royalti Non-Eksklusif atas karya ilmiah:

☐ Skripsi ☐ Tesis ☒ Disertasi ☐ Lain-lain (.....)

yang berjudul :

PLYOMETRIC TRAINING MODEL FOR ELITE VOLLEYBALL ATHLETES IN
SHANDONG PROVINCE

Dengan Hak Bebas Royalti Non-Eksklusif ini Perpustakaan dan Kearsipan Universitas Negeri Jakarta berhak menyimpan, mengalihmediakan, mengelolanya dalam bentuk pangkalan data (*database*), mendistribusikannya, dan menampilkan/mempublikasikannya di internet atau media lain secara **fulltext** untuk kepentingan akademis tanpa perlu meminta ijin dari saya selama tetap mencantumkan nama saya sebagai penulis/pencipta dan atau penerbit yang bersangkutan.

Saya bersedia untuk menanggung secara pribadi, tanpa melibatkan pihak Perpustakaan Universitas Negeri Jakarta, segala bentuk tuntutan hukum yang timbul atas pelanggaran Hak Cipta dalam karya ilmiah saya ini.

Demikian pernyataan ini saya buat dengan sebenarnya.

Jakarta

Penulis

Zhang Xue

(Zhang Xue)

PLYOMETRIC TRAINING MODEL FOR ELITE VOLLEYBALL ATHLETES IN SHANDONG PROVINCE

ZHANG XUE

ABSTRACT

This study aimed to develop and evaluate a plyometric training model specifically designed for elite volleyball athletes in Shandong Province, China. The research employed a Research and Development (R&D) approach consisting of several systematic stages, including needs analysis, research planning, initial product development, expert validation, small group trials, large group trials, revisions, and effectiveness testing. The participants involved 138 respondents in the needs analysis stage and 70 elite athletes in the effectiveness testing phase, divided into experimental and control groups.

The developed training model consists of 15 plyometric exercises categorized into five movement groups: vertical, unilateral, lateral, reactive, and upper-body plyometrics. Expert validation results indicated that the model has high content validity, relevance, and feasibility for elite volleyball performance. Small and large group trials demonstrated that the model is practical, implementable, and suitable for athlete training with minor revisions related to movement complexity and training media.

Effectiveness testing was conducted using a pretest–posttest control group design. The results showed a significant improvement in the experimental group compared to the control group ($t = 2.608$, $p < 0.05$). The mean score of the experimental group increased from 28.74 to 35.11, while the control group improved from 29.06 to 32.37. Furthermore, the N-gain analysis revealed that the experimental group achieved a score of 78% (effective category), whereas the control group obtained 43% (less effective category).

These findings indicate that the developed plyometric training model is valid, practical, and effective in improving explosive power, reactive strength, and volleyball-specific performance. Therefore, this model can be recommended as a structured training program for elite volleyball athletes and can be applied by coaches and strength and conditioning practitioners to enhance athletic performance.

Keywords: plyometric training, volleyball, elite athletes, explosive power, training model, R&D

TABLE OF CONTENTS

CHAPTER I	1
A. Background.....	1
B. Research Restriction Focus	7
C. Problem Formulation.....	7
D. Research Objectives.....	8
E. Research Benefits	8
F. State of the Art.....	9
G. Road Map Research	11
CHAPTER II.....	13
A. Introduction to Training Model Theory.....	13
B. Periodization Theory in Team Sports.....	16
C. Strength and Power Development Theory in Volleyball.....	21
D. Integrated Technical-Physical Training Theory	25
E. Training Load, Monitoring, and Adaptation Theory	30
F. Injury Prevention and Load Management Theory	34
G. Psychological and Cognitive Training Theory.....	37
H. Long-Term Athlete Development and Talent Systems Theory	41
I. Technology, Data Analytics, and Evidence-Based Coaching Theory	44
J. Synthesis of Training Model Theory and Conceptual Framework.....	47
K. Volleyball	51
L. Plyometric	55
M. Plyometric Training Model.....	71
CHAPTER III	73
A. Time and Place of Research.....	73
B. Characteristics of the Created Model.....	73
C. Research Approach and Model.....	75
D. Stages of Model Research.....	77
E. Research Instruments.....	79
F. Validity and Reliability of Instruments	81
G. Data Analysis Technique	84

CHAPTER IV	87
A. Result.....	87
1. Needs Analysis	87
2. Research Planning	87
3. Initial Product Creation	89
B. Revision/Improvement of Final Product	99
C. Discussion.....	99
CHAPTER V	101
A. Conclusion	101
B. Suggestion	102
C. Recommendation.....	104
REFERENCE	94



TABLE OF FIGURES

Figure 3.1 Desain Model Borg & Gall.....	65
Figure 3 2 Design of volleyball training model for elite athlete.....	74



LIST OF TABLE

Table 1.1 Road Map.....	11
Table 3.1 Desain Research (Nonequivalent Control Group Design).....	68
Table 4.1 Initial Draft Plyometric Training for Elite Athlete Design of the.....	78
Table 4.2 Profiles of Expert Judgement.....	79
Table 4.3 Summary of Small Group Trial Results Data	81
Table 4.4 Revised Summaries of Large Group Trial Results	82
Table 4.5 Pretest and Posttest Results Data for Experimental and Control Groups Descriptive Statistics.....	84
Table 4.6 Data from Normality Test Results for Experimental Group.....	85
Table 4.7 Data from Homogeneity Test Results for Experimental and Control Groups.....	85
Table 4.8 Independent Sample T Test Result	86
Table 4.9 Percent N-Gain Data	86
Table 4.10 Categories of N-gain percent value (%).....	87