INTERNATIONAL GRADUATE COLLOQUIUM

# i-SPEAK 2025①

SPORTS AND PHYSICAL EXERCISE ASSEMBLY OF KNOWLEDGE SHARING

COLLOQUIUM PROCEEDINGS

# EXTENDED ABSTRACT

EDITOR | ADAM LINOBY

# EXPERT CONSENSUS-DRIVEN REFINEMENT OF NEXGEN PROMPT GENERATOR AND AI CHATBOT FRAMEWORKS FOR PERSONALIZED ATHLETIC PLANNING

Adam Irman Roslin, Azwa Suraya Mohd Dan, Razif Sazali, Yusandra Md Yusoff, Muhammad Zulqarnain, Amrun Haziq, & Adam Linoby*

*Faculty of Sports Science and Recreation, Universiti Teknologi MARA, Negeri Sembilan Branch, Seremban Campus, Negeri Sembilan, MALAYSIA*

*Corresponding author: linoby@uitm.edu.my

## I. INTRODUCTION

This study refines the NExGEN Prompt Generator–ChatGPT Framework for personalized training and nutrition planning in team sport athletes using the Fuzzy Delphi method. It addresses the limitations of current costly and time-intensive personalized health solutions, focusing on scalable, technology-driven alternatives to improve accessibility and effectiveness [1].

## II. METHODS

This study refined the NExGEN Prompt Generator–ChatGPT Framework through expert input using the Fuzzy Delphi Method. A purposive sample of 21 experts from nutrition, exercise, medicine, psychology, and AI evaluated personalized planning criteria via surveys. Data were analyzed using Triangular Fuzzy Numbers and defuzzification, ensuring consensus on effectiveness metrics. Expert feedback, collected through Likert scales and open-ended responses, informed iterative framework improvements.

## III. RESULTS AND DISCUSSION

### A. Results Analysis on Experts' Views via Fuzzy Delphi

Experts rated the NExGEN framework highly, with all criteria exceeding 75% consensus and meeting thresholds ($d < 0.2$, $\alpha$-cut $> 0.5$). Key improvements included specialized, user-centric prompts for personalized weight management, enhancing AI precision and practicality. Constructs like physical activity metrics, technology integration, and tracking systems achieved over 90% agreement. Defuzzification confirmed the relevance of all elements, ensuring the framework's robustness and expert-aligned customization.

### B. Prompt Analysis and Systematic Refinement Process

Using the Fuzzy Delphi method has optimized NExGEN-ChatGPT prompts for personalized training and nutrition planning in team sport athletes. Aligned with expert consensus, these refined prompts transform broad questions into focused, user-centric queries that yield precise, actionable AI responses. This personalization, seamlessly integrated into athletes' training activities and dietary preferences, delivers practical guidance that boosts engagement and aligns with scientifically grounded recommendations (Table 1).

Applying the Fuzzy Delphi method has significantly improved the NExGEN Prompt Generation Framework, strengthening personalized AI-driven dietary and physical training recommendations for team sports athletes.

TABLE I
SUMMARY OF NEXGEN-CHATGPT FUZZY DELPHI ANALYSIS AND REFINEMENT

| Element | Initial Prompt | Sample Refined Prompt | Change Justification |
|---|---|---|---|
| Desired Outcome | "Set a body composition or fitness goal." | "Achieve weight loss, muscle gain, or target body fat percentage tailored to athletic performance needs." | 65% ± 10% |
| Target Changes | "Determine your weight change goal." | "Aim to lose 6 kg, <5% of current weight, or maintain based on the specific performance goals." | 68% ± 9% |
| Timeline | "Decide on a timeline for your goal." | "Set a timeline of 3 months, 6 months, or 1 year based on your athletic training plan." | 70% ± 8% |
| Start Date | "Pick a start date for your plan." | "Begin the exercise and nutrition program on 15/01/2024." | 73% ± 7% |
| Flexibility in Progress | "Adjust your plans based on progress." | "Indicate if you are willing to adjust your timeline if progress is slower or faster than expected (Yes/No)." | 75% ± 6% |
| Motivation | "Provide a reason for pursuing your goal." | "Focus on optimized performance, achieving specific athletic milestones, or following a doctor's guidance." | 78% ± 5% |

## IV. CONCLUSIONS

The refined NExGEN framework demonstrates high expert consensus and effectiveness in personalized training and nutrition planning for team sports athletes. Improved user-centric prompts and robust Fuzzy Delphi-based validation ensure precision, practicality, and broad

applicability, establishing the framework as a scalable, cost-effective alternative to traditional personalized coaching models.

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A.I., Roslin, et al., *Proceedings of the International Graduate Colloquium: Sports and Physical Exercise Assembly of Knowledge Sharing, i-SPEAK, 2025, 05th–06th February, Malaysia.*

**I-SPEAK 2025 63**