



Developing a Core Model for Expected Characteristics of Group Exercise Instructors in Sports Science Students

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Authors' Contribution: A – Study design; B – Data collection; C – Statistical analysis; D – Manuscript Preparation; E – Funds Collection

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Accepted for Publication: April 6, 2024

Published: April 30, 2024

DOI: 10.17309/tmfv.2024.2.17

Abstract

Background. Sports science experts play a crucial role in providing insights and appropriate recommendations to delineate the desired traits of professional group exercise instructors.

Objectives. The study aimed to investigate the using expert Delphi techniques in developing a core model for expected characteristics of group exercise instructors in sports science students.

Materials and methods. The study involved 18 exercise experts who served as group exercise instructors and lecturers in sports science. Across three questionnaire rounds, the data was assessed using a rating scale, considering Mode (Mo), Median (Mdn), and Interquartile range (IQR).

Results. The experts consistently emphasized the development of the eight core characteristics of group exercise at the highest importance level (Mo = 5, Mdn = 5, IQR = 0). Their focus encompassed areas such as knowledge in anatomy and exercise physiology, proficiency in exercise techniques, understanding of movement, psychological aspects, the role of aerobic dance leadership, and attitude towards group exercise. Additionally, knowledge related to injury prevention and nutrition received respective scores of Mo = 4, Mdn = 4, IQR = 1. Being a group exercise instructor necessitated both physical and mental preparedness.

Conclusions. The desired characteristics for sports science students who will develop themselves to be group exercise leaders have to include a broad range of knowledge to become a personality model, proficiency in all 8 areas, and the ability to effectively teach that lead students to success. And most importantly, the FFITT-VS (Frequency Intensity Training Time Training Type-Volume Progression) principles of teaching should be applied in organizing the group exercise program to ensure appropriateness for each format.

Keywords: characteristic, Delphi technique, group exercise instructors, FFITT-VS principles.

Introduction

Physical activity and exercise across the lifespan can have a profound positive effect on health and well-being (Blair, 2009; Trost et al., 2014). Current recommendations,

such as those from the World Health Organization, state that adults should accumulate at least 150 minutes of moderate-intensity (or at least 75 minutes of vigorous-intensity) physical activity per week in bouts of at least 10 minutes. Additionally, it is recommended that children and young people should accumulate at least 60 minutes of moderate to vigorous physical activity each day (WHO, 2021). In Thailand, there has been significant growth in many places, both public and private, with foreign businessmen introducing modern, innovative, fun, challenging, and internationally accepted

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exercise styles as part of providing a variety of services to customers. This growth also includes the development and upgrading of the abilities of exercise fitness trainers, ensuring they possess knowledge and expertise in customer relations, as well as proficiency as group exercise instructors in various forms of aerobic exercise. The National Sport Development Plan (2021-2025), with strategic goals geared towards having sports volunteers and exercise leaders ready to help or provide sports and physical activity for the local community (Ministry of Tourism and Sports, 2021). According to the policy of the government agency mentioned above, exercise leaders play a key role in promoting healthy behavior, as their roles and missions are related to changing health behaviors for themselves, their families, and the community.

Currently, there are numerous avenues for individuals to develop themselves as fitness trainers, with some organizations offering training for those without a direct degree in sports science but require certification. To become a proficient leader in exercise, individuals should possess a degree in sports and exercise science, be a physical therapist, or have direct knowledge of health. Historically, Thailand has prioritized this issue, providing guidelines for developing fitness trainers with professional abilities and specialized teaching knowledge, particularly in group exercise instruction (GX), integrated into university courses, especially in sports science professions. This is considered a crucial source for producing personnel and leaders in the exercise field, covering roles as leaders in aerobics and fitness instruction. Therefore, the knowledge imparted by leaders needs to be consistently and properly developed in line with international standards, considering the current increase in the number of group exercise instructors. Currently, the format of aerobic dance has evolved with diverse teaching methods, making exercise activities more engaging. Therefore, it is crucial to consider and apply the fundamental principles of aerobic dance training, which are highly beneficial for development and health promotion. Consequently, instructors should integrate these principles into the design of exercise formats to achieve the objectives of aerobic dance. This involves utilizing the "FFITT" principles (Fun, Frequency, Intensity, Time, Type) (AFFA, 2022). Leaders in aerobic dance must comprehend factors related to different forms of physical movement, utilizing principles and theories of anatomical kinesiology and mechanical kinesiology to design movements that ensure safety in activities. Once understanding the mechanisms of joint function or body movement, these can be effectively introduced into practical learning styles. Good exercise leaders should convey knowledge in exercise according to the principles of exercise (ACE, 2007). However, it has been observed that some aerobic dance leaders in the community studied from videotapes purchased and learned on their own, without a direct degree in sports science. This poses an important factor that may lead to oversight in the teaching process and safety during exercise (Pinitniyom, 2007). This raises the question of what the quality and characteristics of an aerobic leader should be and whether exercisers can derive benefits if the aerobic leader possesses incorrect knowledge.

A variety of fitness professionals play a key role in providing concepts and practices to determine the desirable qualities of a professional group exercise instructor. The

Delphi technique is a method for collecting opinions on a particular topic, based on the premise that 'pooled intelligence' enhances individual judgment and captures the collective opinion of experts (Jones et al., 2000; Murry & Hammons, 1995). There are three types of Delphi: conventional, real-time, and policy. The conventional Delphi is the classical forum for the prioritization of facts, involving a questionnaire sent out to a group of experts. A second questionnaire, based on the results of the first, refines and defines the facts or proposals, gauging their accuracy or support from participants (Mariet et al., 2005). The conventional Delphi uses a series of questionnaires to aggregate expert opinions anonymously, taking place over a series of 'rounds.' Communication can occur by post or electronic exchange (Jones et al., 1992). The optimal number of rounds appears to be 2 or 3; however, some Delphi techniques may continue rounds until consensus is achieved or until the last rounds show no significant difference (Graham et al., 2003; Von der Gracht, 2012). As a research process, each Delphi category shares the same overall structure in terms of group communication, anonymity, iteration, and central tendency (Nick & Barry, 2008; Trevelyan & Robinson, 2015).

Defining the right attributes for Group Exercise (GX) can positively impact the development of knowledge and abilities in the professional skills of sports science students. Previous studies have discussed indicators to establish professional competency for elderly exercise instructors (Lan et al., 2016), providing a useful guideline that underscores the importance of developing the characteristics of sports science students to become professionally competent exercise leaders. This aspect has not been studied at the university level in Thailand before. Therefore, various aspects of knowledge must be guided by experts whose knowledge and experience are grounded in the principles of exercise leadership. The researchers recognized the importance of developing desirable attributes for GX using the Delphi method. The Delphi technique, integrating knowledge with experts to determine desirable attributes and incorporating information obtained from the study, serves as a core model for developing sports science students on the verge of becoming future professional group exercise instructors.

Materials and Methods

Study Participants

The participants in this study consisted of 18 qualified individuals with experience in the sports science profession and sports medicine. They were selected using a purposive selection method and divided into three groups: 2 group exercise instructors certified by Les Mills (the copyright owner of group exercise classes), 12 university lecturers who were experts in sports science and exercise, holding a master's degree or higher, and having at least 5 years of teaching experience, and 4 sports medicine professionals in private hospitals who held a bachelor's degree or higher and had at least 5 years of experience in their positions. The participants signed the consent document to participate in the research. The researchers have no conflicts of interest, accurately represent information, and adhere to research ethics in both human and animal subjects. The research

was approved and supervised by the Ethics Committee in Human Research at Loei Rajabhat University, Thailand, project number HE 029/2567.

Study Organization

The researcher introduced personal information, explained the research objectives, and provided a brief description of the use of the Delphi Technique. A three-round questionnaire was employed for the research using the Delphi technique. Round 1 question utilized open-ended inquiries to generate answers that would formulate questions for the 2nd and 3rd rounds of the process. The data were analyzed using a rating scale. Experts could express their opinions to indicate agreement or disagreement with each question at the end of the questionnaire, and they were also encouraged to provide suggestions. The answers were then investigated for Mode (Mo), Median (Mdn), and Interquartile Range (IQR). In the final stage, experts could determine whether to modify or confirm their answers (Fig. 1).

Statistical Analysis

The responses of the Delphi technique panelists were analyzed using descriptive statistics. Central tendency statistical analysis was conducted to analyze the data, determining the level of agreement as a percentage. A pre-established measure of consensus was set at 80%. The experts

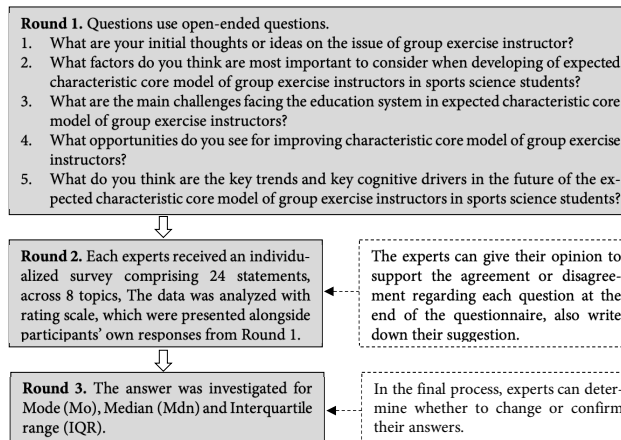


Fig. 1. Flow diagram illustrating the three survey rounds of the Delphi study

answered the questionnaire and freely expressed their opinions about the questions. When there were no suggested changes in the answers, it indicated that the data had high reliability.

To establish a consensus of opinions, qualification requirements include a median greater than or equal to 4.00 or higher and an interquartile range less than or equal to 1.50, indicating consistency or alignment in the same direction. Once the data were complete, the researcher summarized

Table 1. Removed statements

Component of Characteristics	Statement	% of agreement	Outcome	Selected comments
1	Knowledge of Anatomy and Physiology for exercise	87.75%	Removed following Round 2	To design an exercise program tailored to the activity, gender, and age, sports scientists need to possess understanding in anatomical and physiological principles.
2	Knowledge of exercise	85.12%	Removed following Round 2	Group fitness instructors should possess a variety of teaching skills but must also be attentive to safety during exercise.
3	Knowledge of motions in exercise	82.25%	Removed following Round 2	Can be a teaching model and can skillfully explain the method.
4	Knowledge for preventing injury from exercise	78.47%	Removed following Round 3	Sports scientists need to possess the ability to administer appropriate first aid and adhere to life-saving principles.
5	Knowledge of psychology in exercise	82.54%	Removed following Round 2	There exists a remedy for immediate issues and the capability to foster an environment that facilitates enjoyable instruction through language, emotions, and physical activity.
6	Knowledge of nutrition	77.52%	Removed following Round 3	Sports scientists need to comprehend the ethical use of stimulants, including steroids or misuse, which can result in enduring negative health effects.
7	Knowledge of aerobic dance leadership	85.43%	Removed following Round 2	Possess knowledge of instructional abilities and the presentation and elucidation of techniques.
8	Attitude toward being group exercise instructor	88.71%	Removed following Round 2	Exercise leaders ought to convey information in a clear and comprehensible manner, ensuring brevity and employing a positive and constructive communication style.

Table 2. Responses to statements included in five scale which sought agreed approaches

5 rating scale questionnaires			Median Interpretation
Rating scale	Meaning	Median	Interpretation
1	Lowest possibility or lowest level of agreement	Less than 1.50	The statement is mostly impossible or the experts strongly disagree with that statement.
2	Low possibility or low level of agreement	1.50-2.49	The statement is slightly possible or the experts disagree agree with that statement.
3	Not sure	2.50-3.49	The statement is doubtful or the experts slightly agree with the statement.
4	High possibility or high level of agreement	3.49-4.49	The statement is highly possible or the experts mostly agree with the statement.
5	Highest possibility or highest level of agreement	More than 4.50	The statement is possible most or the experts agree the most with the statement.

the information obtained from the analysis of the answers to the three rounds of questionnaires, using the data to design desirable characteristics for group exercise leaders.

Results

Out of the 18 experts surveyed in the field of group exercise instructors (male: 11, female: 7), 1 male and 1 female (5.5%) had a master's degree, with 3 males and 3 females (16.6%). Additionally, 10 experts held a doctorate degree, consisting of 6 males and 4 females (33.3% and 22.2%, respectively). Around 75% of these experts have been researching aerobic dance for over 10 years. Furthermore, approximately 50% of them have worked as group exercise instructors for at least 9 years, and 47.65% have experience as aerobic dance leaders for at least 5 years.

Table 3. Demographic characteristics of Delphi participants

Experts	(n=18)	
Gender	Male (11)	Female (7)
Mean age in years (SD)	42.5 (8.5)	38.6 (6.6)
Education (Number; %)		
Doctoral degree	6 (33.3%)	4 (22.2%)
Master degree	3 (16.6%)	3 (16.6%)
Bachelor degree	1 (5.5%)	1 (5.5%)
Current role (Number; %)		
Professor	–	–
Associate Professor	3 (16.6%)	2 (11.1%)
Assistance Professor	5 (27.7%)	3 (16.6%)
Lecturer	2 (11.1%)	1 (5.5%)
Working in the field	1 (5.5%)	1 (5.5%)
Years working in the field (SD)		
Having research works related in aerobic dance	14 (4.7)	12 (3.3)
With experience as a group exercise instructor	11 (2.8)	10 (2.4)
With experience as an aerobic dance leader	8 (1.8)	8 (1.8)

It was found that in round 3, 16 experts did not change their answers, approximately 90.62%. Meanwhile, 2 experts changed their answers in round 2, approximately 9.37%. If the change rate is lower than 20%, the next round of the questionnaire can be canceled (Murry & Hammons, 1995). A statement from the corresponding luminary ideas on quartile range and the difference between the median and baseline is summarized as a point of opinion of the luminaries in defining desirable attributes for fitness leaders. A section of opinions of luminaries that are important on certain issues. If it is useful, the researcher will discuss the results to make the study data more qualitative. The consistency summary shows that the qualified person has the concept of defining the desirable characteristics of an exercise leader to be up-to-date and skilled in all professional knowledge of 8 topic areas, as shown in Table 4.

The experts focused on knowledge in each area with Mode (Mo) = 5, Median (Mdn) = 5, and Interquartile Range (IQR) = 0. The highest levels were knowledge of anatomy and physiology of exercise, knowledge of exercise, knowledge of motion in exercise, knowledge of psychology in exercise, knowledge of aerobic dance leadership, and attitude toward Group Exercise (GX). Additionally, in the highest knowledge areas, Mo = 4, Mdn = 4, IQR = 1, were knowledge for preventing injury in exercise and knowledge of nutrition.

Discussion

Being an exercise instructor requires knowledge in various areas and the ability to convey the principles of exercise accurately and safely. The researcher was supported by 18 experts using the Delphi technique to gather opinions based on the experts' body of knowledge. It was found that with 17 experts or more, the error rate in the questionnaire process may be reduced to 0.02 (Macmillan, 1971). Therefore, the credibility of the information obtained depends on the skill and experience of experts who have knowledge and expertise in specific areas.

In this research, it was found that most of the experts were knowledgeable and experienced in being leaders in exercise/health and group exercise instruction (GX) for 10 years or more. This information is valuable for developing the expected characteristics of the model for group exercise instructors from this research study. The important topic

Table 4. Mode, Median and Interquartile ranks of the experts' opinion toward 8 areas of knowledge

No	Topic areas	Round 2			Round 3			Level of importance
		Mo	Mdn	IQR	Mo	Mdn	IQR	
1	Knowledge of Anatomy and Physiology for exercise	4	4	1	5	5	0	Strong agree
2	Knowledge of exercise	5	5	0	5	5	0	Strong agree
3	Knowledge of motions in exercise	5	4	0.8	5	5	0	Strong agree
4	Knowledge for preventing injury from exercise	4	5	0	4	4	1	Strong
5	Knowledge of psychology in exercise	4	4	1	5	5	0	Strong agree
6	Knowledge of nutrition	4	4	0.8	4	4	1	Strong
7	Knowledge of aerobic dance leadership	5	4	1	5	5	0	Strong agree
8	Attitude toward being group exercise instructor	5	5	0	5	5	0	Strong agree

Mode = Mo, Median = Mdn, Interquartile range = IQR

areas consisted of 8, as follows: First, the knowledge of anatomy and physiology of exercise. Most experts agreed that understanding anatomy and physiology is fundamental to exercise. Therefore, GX should have knowledge of the structural position of the body and the functions of various systems that affect the body, both at rest and during exercise. GX should be able to understand and explain the changes that occur to ensure safety and prevent dangers (Bryant et al., 2011).

The second is knowledge of exercise. Mostly, experts focused on this issue since GX must understand the principles of exercise for maximum benefit and safety while exercising. Therefore, the experts' opinions consistently emphasize that exercise knowledge has the highest level of agreement. Additionally, the content emphasized by the experts is the fundamental correct postures of exercise and safe exercise program management. Exercise leaders should understand each exercise activity pattern to support and promote effective and sustained exercise (Wanke et al., 2021; Haenel et al., 2021).

The third is movement or motion in exercise. The experts scored this aspect as the highest level of importance (Mo = 5, Mdn = 5, IQR = 0) in terms of muscles and joints mechanisms that affect the efficiency of movement. Therefore, it was proposed that GX should have good motor skills and the correct form of movement according to the mechanics of the body. GX should also transmit the method and the key principles in moving the body properly and safely because group exercise classes involve constant movement in various forms and directions. Correct skill and the performance of appropriate movements affect the ability to control movements safely (Li et al., 2022).

The fourth is knowledge for preventing injuries from exercise. Intensity and speed of movements are important factors contributing to long-term acute and chronic injury problems (Jacobs et al., 2012). Group exercise instructors or aerobic dance leaders should have knowledge and practices in preventing injuries and accidents (Mo = 4, Mdn = 4, IQR = 1), with a focus on locations and equipment that may cause harm while exercising and how to provide first aid. Exercise leaders should have the knowledge to provide advice in order to prevent injuries, assess initial injuries,

and treat injuries that occur. Exercise leaders check the availability of venues, shoes, and exercise equipment, as well as describe the factors that may cause injury to enhance the exercise as effectively as possible (Bowerman et al., 2015; Storm et al., 2018).

The fifth topic is knowledge of exercise psychology, focusing on how to persuade others to join dance classes regularly. The experts also suggested that aerobic dance leaders need to strongly motivate dancers to feel the fun of exercising and avoid getting bored with the dance class atmosphere. Consequently, this area was rated with the highest level of importance (Mo = 5, Mdn = 5, IQR = 0). There were also mentions regarding the importance of the good personality of GX that needs to be developed to attract the audience to dance. Therefore, group exercise instructors must be mentally prepared with teaching psychology, an ability to entertain in the class to make it fun and challenging, verbally motivate, and include each participant equally (Marcus & Lewis, 2003).

The sixth topic is knowledge of nutrition (Mo = 4, Mdn = 4, IQR = 1). The experts suggested that it is necessary to know some topics regarding nutrition, such as guidelines for a proper diet program. However, exercise leaders need knowledge and skills that can provide advice on healthy nutrition and nutrition for enhancing physical fitness. They can give advice to service users who are questioning and want to lose weight. Therefore, exercise leaders should have guidelines and useful recommendations for choosing the right diet along with various forms of exercise (Benardot, 2007).

The seventh is knowledge of the group exercise instructor. The experts scored the importance of it at the highest level (Mo = 5, Mdn = 5, IQR = 0). It is significantly suggested that exercise leaders must have a good personality, dress appropriately to lead the dance, select suitable songs for teaching activities, create a proper procedure for teaching dance, and select appropriate dancing postures that fit well with the participants. Exercise leaders should also avoid those dancing postures that may be too dangerous to perform. The dance leader must be able to correct the dancer's incorrect movement posture until it can be safely followed. As the saying goes, "Those who are going to lead others are not only qualified with the expected physical qualities and personal-

ity of a leader because characteristics of leaders are related or compatible with the activities and goals of followers” (Stogdill, 1948). In this regard, experts focused on using a variety of techniques to apply dance teaching activities that are modern, innovative, and challenging. During class, dance leaders should greet participants by smiling or making eye contact, walk thoroughly, and look widely at all participants while leading the dance, and appreciate everyone appropriately. Before finishing, use techniques to say goodbye and thank all participants after completing every class.

Finally, the last topic is the attitude toward being a group exercise instructor. The attitude toward being a GX or instructor was scored by the experts at the highest level of importance (Mo = 5, Mdn = 5, IQR = 0). Being a GX requires both physical and mental readiness. Group exercise instructors should be able to create interesting teachings, always improve their own abilities, and love their own responsibilities. The researcher recognizes the importance of GX properties in developing the potential of sports science students in leadership. Success as a group exercise instructor requires a positive attitude and sincere self-respect, along with respect for other professional peers.

This study indicates that building competency in the characteristics of group exercise leaders should involve specific learning approaches. In the past, there may have been issues with the quality and capability of exercise trainers working in fitness facilities across various locations. Some individuals may lack the expertise to design exercise programs. As reported by Ecclestone and Jones in 2004, the quality of a fitness trainer should be someone who undergoes a standardized learning process and holds certification. Because the role and duties of an exercise instructor require an understanding of the principles of exercise steps, including safety while exercising, especially among the elderly. For success in exercise, adherence to the FFITT principles is essential. However, from the perspective of current GX instructors, there's a need to create diversity in teaching to challenge abilities while also considering the risk of injury and safety. Thus, researchers recognize that both aspects are crucial in organizing GX programs for successful and safe teaching practices. Therefore, they propose modern principles of GX, specifically FFITT-VS, where Variety and Safety principles are highly beneficial for imparting knowledge effectively and safely to both instructors and learners. This ensures that exercise sessions are efficient and learners genuinely benefit from the training. However, in Thailand, the development of training courses for fitness trainers is becoming widespread in both public and private agencies. The results of this research will serve as an indicator certified at the university level and used in teaching sports and exercise science students to develop their potential as exercise trainers, including training future fitness trainer experts.

Conclusions

This research shows that the advice given by the experts is beneficial for the development of the expected characteristics core model of a group exercise instructor in sports science students. In terms of the body of knowledge, it can be implemented for teaching and learning, as well as serving as a guideline to develop sport scientists, including

group exercise instructors who need to be qualified with all 8 expected characteristics, being knowledgeable and skillful to perform properly according to the correct procedure. Additionally, being a person who is able to be a role model for others and having good morals and ethics.

Acknowledgement

The researcher would like to thank 18 experts in Thailand who cooperate well and this research is funded by the Research and Development Institute Loei Rajabhat University. Finally, appreciate for being kind. Endu, my daughter, encouraged this research project.

Conflict of interest

The authors declared no potential conflicts of interest.

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Розробка базової моделі для формування очікуваних характеристик інструкторів з групових фізичних вправ при підготовці студентів спортивних дисциплін

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Авторський вклад: А – дизайн дослідження; В – збір даних; С – статаналіз; D – підготовка рукопису; Е – збір коштів

Реферат. Стаття: 8 с., 4 табл., 1 рис., 28 джерел.

Історія питання. Фахівці зі спортивних дисциплін відіграють вирішальну роль у наданні інформації та відповідних рекомендацій щодо визначення бажаних якостей професійних інструкторів із проведення групових занять з фізичних вправ.

Мета дослідження. Метою роботи було дослідити застосування методів експертних оцінок Дельфі при розробці базової моделі очікуваних характеристик інструкторів з групових фізичних вправ при підготовці студентів спортивного профілю.

Матеріали та методи. У дослідженні взяли участь 18 фахівців у галузі фізичних тренувань, які працювали інструкторами з групових фізичних вправ та викладачами спортивних дисциплін. Впродовж трьох етапів анкетування дані оцінювали за рейтинговою шкалою, враховуючи моду (Mo), медіану (Mdn) та інтерквартильний розмах (IQR).

Результати. Експерти постійно акцентували увагу на розробці восьми основних характеристик групових вправ на найвищому рівні значущості (Mo = 5, Mdn = 5, IQR = 0). В центрі їхньої уваги були такі сфери, як знання анатомії та фізіології фізичних вправ, майстерність техніки виконання фізичних вправ, розуміння рухів, психологічні аспекти, роль лідерства в аеробних танцях і ставлення до проведення групових фізичних вправ. Крім того, знання, пов'язані з профілактикою травм і харчуванням, отримали відповідні бали Mo = 4, Mdn = 4, IQR = 1. Робота інструктора з групових фізичних вправ вимагала як фізичної, так і психічної підготовки.

Висновки. До бажаних характеристик студентів спортивних дисциплін, які прагнуть стати лідерами групових фізичних тренувань, слід віднести широкий спектр знань, які дозволять їм сформувати необхідну модель особистості, володіння майстерністю у всіх 8 сферах, а також здатність до ефективного навчання, що спрямовує студентів на досягнення успішних результатів. Та найголовніше полягає в тому, що принципи навчання FFITT-VS (Frequency Intensity Training Time Training Type-Volume Progression — ключові компоненти тренування, що визначають частоту, інтенсивність, тип та час виконання вправ у відповідному обсязі та прогресії) слід застосовувати в процесі організації програми групових фізичних вправ, з метою забезпечення доцільності для кожного формату тренування.

Ключові слова: характеристика, метод Дельфі, інструктори з проведення групових фізичних вправ, FFITT-VS принципи.

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Cite this article as: Phanpheng, Y., Tongnum, P., Kusuma, I.D.M.A.W., Rohmansyah, N.A., Chainarong, A., & Boonprakorn, K. (2024). Developing a Core Model for Expected Characteristics of Group Exercise Instructors in Sports Science Students. *Physical Education Theory and Methodology*, 24(2), 310–317. <https://doi.org/10.17309/tmf.2024.2.17>

Received: 16.02.2024. Accepted: 06.04.2024. Published: 30.04.2024

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