THE INFLUENCING FACTORS ON THE INSTRUCTIONAL MODEL OF THE PROFESSIONAL ASSOCIATION OF DIVING INSTRUCTORS

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Abstract: As diving equipment and techniques are constantly updated, traditional instructional models may not cover the latest technology and safety measures, and course content and teaching methods need to be updated to reflect these changes. PADI courses are implemented globally, and differences in culture, language, and diverse environments of the participants in different regions need to be considered and adapted in the instructional model. The study's objectives were 1) to explore whether the advanced teaching equipment affects the instructional model of the Professional Association of Diving Instructors. 2) to explore whether teaching safety affects the instructional model of the Professional Association of Diving Instructors. 3) to explore whether the individualized needs affect the instructional model of the Professional Association of Diving Instructors. This study adopted the quantitative research method. Four hundred questionnaires were distributed during the survey period, and 322 valid questionnaires were recovered, with a validity rate of 80.5%. This paper found that: 1) Advanced teaching equipment has a significant positive effect on the instructional model of the Professional Association of Diving Instructors. 2) Teaching safety significantly affects the instructional model of the Professional Association of Diving Instructors.3) Individualized needs significantly positively affect the instructional model of the Professional Association of Diving Instructors. For recommendations, PADI should focus on the following aspects: 1) Equipping with advanced teaching equipment; 2) Adopting safety measures; 3) Personalized teaching methods.

Keywords: Professional Association of Diving Instructors, Instructional Model, Advanced Teaching Equipment, Teaching Safety, Individualized Needs

Introduction

The Professional Association of Diving Instructors (PADI) is one of the largest dive training organizations in the world. Founded in 1966, PADI offers a wide range of diving courses, from beginner Open Water Diver courses to advanced professional-level courses such as Instructor, and is renowned for its high standards of safety and quality of instruction (Buzzacott et al., 2021). PADI courses are structured and systematic, with a modular approach that allows students to develop their diving skills

through theory, calm water training (e.g., swimming pools), and open water training (e.g., oceans and lakes). Upon completing all program levels, students receive the appropriate international certification, allowing them to participate in diving activities worldwide (Lippmann et al., 2018).

As diving equipment and techniques are constantly updated, traditional instructional models may not cover the latest technology and safety measures, and course content and teaching methods need to be updated to reflect these changes. Despite the emphasis on safety in PADI courses, diving accidents continue to occur, demonstrating the need to improve divers' safety awareness and emergency response skills through improved instructional models and content (Roche et al., 2016). The effectiveness of the existing instructional model also deserves to be evaluated, especially regarding the participants' shortcomings in acquiring theoretical knowledge and practical skills. For example, after the short courses, confident trainees still lack sufficient experience and confidence. In addition, standardized courses cannot meet the needs of all participants, especially those with different backgrounds, abilities, and learning styles, which suggests introducing more personalized and flexible teaching methods to improve learning outcomes (Baron-Thiene & Alfermann, 2015).

Diving is a psychologically demanding sport, so psychological issues such as the fear and anxiety of participants are better dealt with in teaching to ensure their mental health and stability during the diving process. At the same time, with the increasing awareness of marine environmental protection, the course content needs to incorporate ecological protection education better to cultivate the participants' environmental awareness and sense of responsibility (DiFiori et al., 2014). PADI courses are implemented globally, and there are differences in the participants' culture, language, and dive environments in different regions, which need to be considered and adapted in the instructional model. Therefore, this study aims to provide a theoretical basis and practical guidance for improving the instructional model of PADI courses, improving the quality of the courses, and enhancing the students' learning experience and diving safety.

Despite its worldwide reputation, the PADI dive course instructional model still faces some problems in practice. With the rapid development of diving technology, PADI courses in some regions and training centers may not be able to update the equipment and teaching content in time, resulting in students being unable to access the latest diving technology and methods. This not only limits students' learning experience but may also affect the safety and efficiency of diving. Some instructors lack sufficient experience or do not adequately emphasize emergency handling and risk management education. In addition, safety standards and operating procedures are updated at different rates in different regions, resulting in trainees failing to grasp the latest safety knowledge and emergency handling methods. Different trainees have different backgrounds, learning styles, and ability levels. Some trainees may need more time to acquire skills or adapt to specific environmental conditions, which a standardized teaching schedule may not adequately support. In addition, cultural and linguistic differences may affect participants' understanding and application of course content, especially in an

international teaching environment.

Therefore, there is a need to improve the overall teaching quality of PADI diving courses, enhance the safety awareness and skill level of participants, and cultivate more diving enthusiasts who love and respect the ocean, thereby promoting the healthy development of the sport and the advancement of marine conservation.By updating and introducing advanced teaching equipment promptly, trainees can experience the latest diving technology and improve their learning effectiveness and diving safety. Strengthening education on emergency handling and risk management, as well as regularly updating safety standards and operating procedures, can further enhance the safety of diving instruction, so that trainees can calmly and correctly deal with emergencies when facing them, and reduce the occurrence of diving accidents. In addition, flexible and personalized teaching methods to meet the needs of different trainees can enhance the learning effect, and trainees' confidence and skill levels can be strengthened. Considering cultural and linguistic differences, the provision of multilingual course materials and instructor training in cross-cultural communication skills helps to create a learning environment of inclusion and understanding so that learners from all over the globe can effectively understand and apply what they have learned (Baron-Thiene & Alfermann, 2015; DiFiori et al., 2014).

Research Objectives

(1) To explore whether the advanced teaching equipment affects the instructional model of the Professional Association of Diving Instructors.

(2) To explore whether teaching safety affects the instructional model of the Professional Association of Diving Instructors.

(3) To explore whether the individualized needs affect the instructional model of the Professional Association of Diving Instructors.

Literatures Review

Instructional Model

An instructional model is a set of systematic and structured methods and strategies used in the educational process to guide teaching activities. It includes designing and implementing teaching objectives, teaching content, teaching methods, teaching organization, teaching evaluation, and other aspects, aiming to optimize teaching effectiveness and enhance learning efficiency (Oppenheimer et al., 2009). The teaching objective is to clarify the knowledge and skills that learners should master at the end of the course. Teaching content refers to the topics and knowledge points covered in the course, which are usually organized in a particular logical order to help learners understand and master them gradually. Teaching methods include various teaching tools and techniques the teacher uses in the classroom, such as lectures, discussions, experimentation, and case studies (Serlina & Leonard, 2020). The choice of these methods depends on the course objectives and content, as well as the needs and

characteristics of the learners. Teaching organization involves arranging and implementing teaching activities, such as lectures, experiments, field trips, group discussions, and online learning. The form of organization needs to consider the characteristics of the learning environment, resources, and learners (Wang, 1976). Teaching evaluation assesses the extent to which learners have mastered knowledge and skills. The selection and design of instructional models significantly affect the teaching effect, and different instructional models are suitable for different educational contexts and learning needs. Through the systematic design of the instructional model, educators can better organize teaching activities, stimulate learners' interest, and improve the learning effect and teaching quality (Savery & Duffy, 1995).

Advanced Teaching Equipment

With the continuous innovation of diving equipment and technology, divers can use more advanced and complex equipment, significantly improving the safety, comfort, and operational efficiency of diving. For example, modern dive computers can monitor and calculate the diver's depth, time, gas mixture, and decompression time in real time (Sepasgozar, 2020). These devices often have large screen displays, touch-screen operation, and wireless gas integration capabilities, greatly simplifying data monitoring during the dive. In addition, retrievable bladders reduce gas consumption and extend dive time by recirculating breathing gas, reducing underwater foam production, and minimizing disruption. On the other hand, high-performance wetsuits utilize more advanced materials and designs to provide better warmth and flexibility for a broader range of water temperatures and diving conditions (Lundell et al., 2019). These new devices improve the safety and comfort of diving and change how divers behave and operate underwater.

Diving course updates need to include how to operate new dive computers, the use and maintenance of recirculation, and how to select and care for high-performance wetsuits. In addition, Virtual Reality (VR) and Augmented Reality (AR) technology provide new means of teaching diving. Through VR and AR technologies, students can train in simulated natural underwater environments, thus enhancing the learning experience and practical skills. These technologies can simulate various underwater situations and emergencies, allowing students to repeatedly practice in a safe environment and master coping with them.AR technology can also provide real-time guidance and information display during the dive, further enhancing the teaching effect and safety (Lundell et al., 2019). These advanced technologies make diving instruction more intuitive, vivid, and efficient.

Teaching Safety

Diving accidents happen constantly, which puts higher demands on the instructional model. Courses must ensure that trainees not only master basic diving techniques but can also cope with various emergencies, such as equipment malfunctions, fast currents, and missing dive partners (Bhide, 2000). An essential aspect of improving safety is strengthening emergency training and risk management education so that participants can deal calmly and correctly with potential dangers. Emergency training

plays a vital role in the course design. It simulates various emergencies such as equipment failure, extrication from rapids, and missing dive partners so trainees can practice repeatedly in real-life situations to enhance their coping ability. By simulating these emergencies, participants will be able to familiarize themselves with various emergency operations in a safe and controlled environment to have the confidence and skills to calmly deal with problems during actual diving (Aygün & Tüfekçi, 2020).

The course should include detailed risk identification and management strategies to teach participants to anticipate potential hazards and take preventive measures (Park et al., 2015). For example, understanding the environmental characteristics of the dive site, information on tides and currents, proper planning of dive trips, observing dive depth and time limits, and regular checking and maintenance of dive equipment. In addition, participants should learn the importance of teamwork and maintain good communication and collaboration with their dive partners to support each other in an emergency (Park et al., 2015). Diving courses not only focus on teaching basic skills but also emphasize the education of emergency handling and risk management to enhance the students' safety awareness and practical operation ability in all aspects. By constantly updating and improving safety standards and procedures, we ensure our students can always dive safely and confidently in the ever-changing diving environment.

Individualized Needs

Diving students come from different backgrounds, learning styles, and ability levels, so a standardized instructional model may not meet all students' needs. This requires a more flexible and personalized approach to ensure that each participant learns and masters diving skills at a pace and in a manner that suits them (Morgan, 2009). For example, some trainees may need more time to master specific skills, especially in more technically complex areas or presenting specific challenges to the individual. In such cases, the course design should include a hierarchy of instruction that allows participants to learn at their own pace and ability. Frustration and stress in learning can be avoided by progressively increasing the difficulty level to ensure that each learner masters the basic skills before moving on to more advanced ones (Potasman & Pick, 1997).

Group guidance and individual counseling are also important ways to enhance teaching effectiveness. Group coaching can promote communication and mutual support among trainees, especially in teamwork and submerged partner system training; through group interaction, trainees can learn from and support each other (Potasman & Pick, 1997). Individual coaching, on the other hand, can provide personalized guidance and assistance for the specific needs and problems of the trainees. For example, for trainees who feel uncomfortable under specific environmental conditions, coaches can help them gradually adapt to and overcome these difficulties through individual counseling to enhance their self-confidence and adaptability. In addition, cultural and linguistic differences are also important factors that need to be considered and adjusted in the course. PADI conducts dive instruction globally, and students from different regions may have different cultural backgrounds and language abilities

(Morgan, 2009). To ensure that students from all parts of the world can effectively understand and apply what they are learning, course materials should be multilingual, and instructors must be able to communicate across cultures. For example, course materials and instructional videos can be translated into multiple languages, culturally biased examples and metaphors should be avoided, and instructors must know and respect their students' cultural backgrounds and habits to create an inclusive and understanding learning environment.

The equipment's sophistication influences the mode of teaching diving courses, the instruction's safety, and the need for individualization. By continually updating technical content, enhancing safety training, and providing personalized instruction, Dive Instruction can continually improve its courses and ensure that students can access high-quality training worldwide (Aygün & Tüfekçi, 2020; Sepasgozar, 2020).

Methodology

This study adopted the quantitative research method. This study was conducted to collect data from PADI participants. A questionnaire was designed based on the Maturity Scale. The questionnaire of this study consists of two aspects: on the one hand, the essential demographic characteristics of the respondents were analyzed to derive the primary data such as gender, age, literacy, and collection; on the other hand, variables such as advanced teaching equipment, teaching safety, individualized needs, and instructional model were measured. A Likert "five-point scale" was used, i.e., a numerical choice from 1 to 5, with 1 indicating "strongly disagree," 2 indicating "disagree," 3 indicating "neutral,"4 indicating "agree," and 5 indicating "strongly agree." The questionnaire survey was conducted from March 1, 2024, to June 1, 2024; the research was mainly conducted by distributing questionnaires online. 400 questionnaires were distributed during the survey period, and 322 valid questionnaires were recovered, with a validity rate of 80.5%.

Research hypotheses were formulated based on the analysis:

H1: Advanced teaching equipment significantly affects the instructional model of the Professional Association of Diving Instructors.

H2: Teaching safety significantly affects the instructional model of the Professional Association of Diving Instructors.

H3: Individualized needs significantly positively affect the instructional model of the Professional Association of Diving Instructors.

Results

1). Reliability Analysis

The survey data showed that the reliability of the questionnaire was good. The questionnaire had a total of 22 items. When the reliability coefficient of the subscale is above 0.7, the reliability

coefficient of the scale or questionnaire is reasonable; when the coefficient of subscale is between 0.6-0.7, it is also acceptable; when the reliability coefficient of the total scale needs to reach 0.8 or higher, it proves that the overall reliability is good. The Cronbach's alpha of advanced teaching equipment is 0.900. The Cronbach's alpha of teaching safety is 0.901. The Cronbach's alpha of individualized needs is 0.891. The Cronbach's alpha of the Instructional model is 0.842, and the Cronbach's alpha of each variable is more significant than 0.8, which indicates that the scale has high stability and consistency. This indicated that the reliability of the survey research questionnaire is good.

2). Validity Analysis

The Kaiser-Meyer-Olkin value (KMO) compares the simple and partial correlation coefficients between variables, ranging from 0 to 1. A KMO value should be greater than 0.7, and a KMO value of 0.9 or higher indicates that the data on the scale are "well suited" for factor analysis. Factor analysis. The survey data showed that the overall KMO value was 0.928, with a significance of 0.000, which is less than 0.05, reaching a significant level, indicating that factor analysis could be conducted. Confirmatory factor analysis (CFA) was conducted in this study.

From the results of the factor analysis of the variables, it is known that the cumulative explanatory rate of advanced teaching equipment, teaching safety, and individualized needs are 68.845%, respectively, more significant than 0.5. this indicates that they are suitable for factor analysis. Three valid factors were obtained from the factor analysis: advanced teaching equipment, teaching safety, and individualized needs.

3). Correlation Analysis

Correlation analysis is a statistical method to study whether there is a correlation between things and the strength of the correlation; the primary purpose is to study the closeness of the relationship between variables. The correlation takes a value between 1 and -1. This study analyzes the relationship between advanced teaching equipment, teaching safety, individualized needs, and instructional models. The correlation coefficients illustrate the factors influencing the instructional model of diving courses. The results of the analysis showed that the Pearson correlation coefficients of advanced teaching equipment, teaching safety, individualized needs, and instructional model were between 0.421 and 0.642, which is less than 0.9 and $P<0.01$, indicating that there is a correlation between the variables and, they are positive. Are correlated and positively correlated.

4). Multiple Regression

Multiple regression analysis was performed on the data to determine the relationship between the dependent and independent variables.

The regression equation was significant, $F=58.296$, $p<0.001$. The Durbin-Watson test value was 2.127, which is between 1.8 and 2.2. The data were independent and consistent with linear regression. In the diagnostic results of covariance, the VIF values of advanced teaching equipment, teaching safety, and individualized needs were 1.222, 1.297, and 1.472, respectively. The VIFs were

close to 1.5, which meets the requirement and indicates no covariance in the data. advanced teaching equipment (β=0.565, P<0.001), teaching safety (β=0.335, P<0.001), and individualized needs (β=0.396, P<0.001) significantly and positively affect the instructional model. These variables together explain the instructional model. Together, the variables explained the weight of 59.9% of the instructional model, which meets the requirement.

Table 1: Multiple regression

Item	Un-std. B	Std. Beta	t	Sig.	VIF	F	Durbin-Watson
C	0.944		4.193	0.000		58.296 ***	2.127
Advanced teaching equipment	0.565	0.555	9.097	0.000	1.222		
Teaching safety	0.335	0.329	6.417	0.000	1.297		
Individualized needs	0.396	0.362	6.624	0.000	1.472		
R Square	0.599						
Adjusted R Square	0.592						

NOTE: *P<0.05, **P<0.01, ***P<0.001

Discussion

Through data analysis, this study found that advanced teaching equipment, teaching safety, and individualized needs are influential factors in the instructional model of the PADI scuba diving course. Through correlation and regression analyses, Pearson's correlation coefficients of advanced teaching equipment, teaching safety, individualized needs, and the instructional model were 0.642,0.502,0.520, respectively, less than 0.9 and P<0.001. The correlation analyses showed that advanced teaching equipment, teaching safety, and individualized needs influence the PADI diving course instructional model. 0.001. Correlation analysis shows a correlation between advanced teaching equipment, teaching safety, individualized needs, and instructional models. All these factors affect the PADI diving course instructional model. Also, the correlation analysis can be concluded to show a correlation between the variables.

These findings suggest that advanced teaching equipment can improve teaching quality and enhance student's learning experience and effectiveness. Modern equipment provides more intuitive teaching content and simulates the natural diving environment so participants can better master diving skills. In addition, teaching safety is an essential factor that cannot be ignored in a diving course. Diving is a sport with a certain degree of risk; suitable teaching safety measures can effectively reduce the potential risks to students in the learning process and improve their sense of security, thus enhancing their learning motivation and confidence. The satisfaction of individualized needs is also an essential factor influencing the instructional model. Each learner has different learning abilities, backgrounds, and needs, and personalized teaching can better accommodate the different needs of learners and enhance their learning outcomes.

Through flexible teaching methods, instructors can tailor their instruction to the specific needs

of the trainees and help them master their diving skills more effectively. State-of-the-art equipment, safety, and personalization are all critical factors that influence the instructional model of a PADI dive course. Implementing these factors can significantly improve the quality of instruction and the student's learning experience. Future research can further explore how these factors can be optimized to continuously improve the dive instructional model and increase student satisfaction and learning outcomes. The findings of this study provide a necessary theoretical basis and practical reference for improving and optimizing diving teaching.

Conclusions

The study's results indicate that the hypotheses are valid. They suggest that state-of-the-art teaching equipment, teaching safety, and individualized needs all significantly positively impact the instructional model of PADI scuba diving courses. Realizing these factors can improve the quality of teaching and the student's learning experience and optimize the overall instructional model.

Advanced teaching equipment has a significant positive impact on the instructional model of PADI. The research results show that the Pearson correlation coefficient between advanced teaching equipment and instructional model is 0.642, and the P value is less than 0.001, indicating a significant positive correlation between the two. Advanced teaching equipment can enhance teaching effectiveness in various ways, such as providing intuitive learning materials, simulating natural diving environments and situations, and helping participants better understand and master diving skills. In addition, modern equipment is usually more reliable and safer, indirectly enhancing the students' learning experience. Therefore, equipping students with advanced teaching equipment improves the quality of teaching and enhances their motivation and confidence, which has a significant positive impact on the instructional model of PADI diving courses.

Teaching safety significantly impacts the Professional Association of Diving Instructors (PADI) instructional model. According to the study results, the Pearson correlation coefficient between teaching safety and the instructional model is 0.502, and the P value is less than 0.001, indicating a significant positive correlation between teaching safety and the instructional model. Diving is a risky activity, and suitable teaching safety measures are crucial to the success of a diving program. Through strict safety management, perfect safety equipment, and emergency plans, we can significantly reduce the potential risks to students in the learning process and improve their sense of security and trust. This not only protects the physical safety of the students but also allows them to concentrate more on their studies in a safe environment, thus improving the overall teaching effectiveness. Therefore, teaching safety has a significant positive impact on the instructional model of PADI diving courses.

Individualized needs significantly impact the Professional Association of Diving Instructors (PADI) instructional model. Pearson's correlation coefficient between individualized needs and the instructional model was 0.520, and the P value was less than 0.001, indicating a significant positive

correlation between the two. Meeting the individualized needs of the learners is an essential factor in improving the effectiveness of teaching and learning. Each trainee has different learning backgrounds, abilities, and needs, and personalized teaching methods can be adapted to their specific situation to help them better master diving skills. For example, the instructor can provide more time and guidance for slower learners, while more complex exercises and challenges can be provided for faster learners. Such personalized instruction enhances learners' learning outcomes and increases their learning satisfaction. Therefore, satisfying individualized needs significantly impacts the instructional model of PADI diving courses.

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