

A CDIO Education Model for Hospitality Management in Context of Artificial Intelligence and Informatization

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Abstract

INTRODUCTION: Currently, demand for travel in China remains strong, and the tourism industry continues to grow. In the post-epidemic era, China's tourism industry is recovering and prospering, which also means that the tourism industry needs talent. As the demand for talent increases, basic hotel management training is gradually becoming the most significant factor affecting the development of applied professionals.

OBJECTIVES: To enhance the development of online higher education based on the Internet in China and promote the informatization of tourism management and hotel management teaching; to solve the current problems of deviation between theory and practice in hotel management majors and the inability of hotel management students to engage in related professions; and to promote the fusion of the CDIO education model and the traditional education model, and to fundamentally improve the quality of teaching in hotel management majors.

METHODS: In the study, firstly, literature research and theoretical research are used to conduct a detailed survey of CDIO education mode; then, the academic research results of CDIO are used to compare with the traditional hotel management teaching mode to summarize the problems existing in the conventional hotel management professional education; finally, information technology is measured through the empirical method to enhance the teaching and learning of hotel management.

RESULTS: There is currently a deviation between the theory and practice of online teaching in the hotel management program; the CDIO education model can better enhance hotel management teaching; and the overall understanding of on-campus practice-based learning, off-campus practice-based learning, and self-study skills of hotel management students is higher than average.

CONCLUSION: The concept and content of practice learning, the idea and standards of CDIO, the practice learning model of the Bachelor's degree in hospitality management, and the theoretical direction and feasibility of constructing a practice learning model for the Bachelor's degree in hospitality management based on CDIO theory were explored. The importance of referencing values and leadership in conjunction with progressive learning, curriculum renewal, and course design was found.

Keywords: artificial intelligence, information technology, hospitality management, CDIO education

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1. Introduction

Against the backdrop of growing demand for innovation and multidisciplinary skills in the humanities, the

Government is also seeking to develop new interdisciplinary skills in the humanities. The Ministry of Education has developed guidelines emphasizing cultural trust and economic development and pioneered new humanities areas. At the same time, the Ministry of Education has called on all districts and universities to

develop applied primary education in which knowledge, wisdom, and competence play a leading role. Regarding the new humanities, the main goal of the UAS degree is to develop applied skills. The Ministry of Education (MOE) has proposed in the National Quality Standard for Hospitality Training in 2018 to improve hospitality management skills that can travel, adapt to the market, and apply tourism by constantly exploring new development paths and making a solid contribution to the development, application, and internationalization of the latest need for humanities education (Yan et al., 2021). The shift in the main direction of hospitality management must follow three concepts: perfection, practicality, and innovation. In developing new humanities disciplines, further integration of disciplinary concepts, clarification of learning levels, and optimization of practical learning modes are the main objectives to enhance and optimize practical learning for hotel professionals.

China's industrial structure is accelerating, and the tourism industry is in a position of stable development. It will become a new economic growth point and the basis of industrial strategy (He et al., 2023). China's travel demand remains strong, and the tourism industry thrives. In the post-epidemic era, China's tourism industry is recovering and prospering, which also means that the tourism industry needs talent. As the demand for talent increases, basic hotel management training is gradually becoming the most significant factor affecting the development of applied professionals (Lockstone-Binney & Ong, 2022). The lack of appropriate measures and awareness in the process of tourism education in national tourism universities has led to poor quality of training skills, lack of application, and complexity of professionalism. At the same time, hospitality students have experienced a severe "graduation transition" phenomenon. Once students start working, they find it challenging to integrate theory into practice and adapt to the changing roles of students and teachers. As a result, China's tourism industry needs more innovative and applied tourism capabilities (Z. Liu et al., 2021). Tourism universities should continue to optimize the nature, content, and form of on-the-job training, improve training concepts, promote the integration of theory and practice, increase the productivity of complex and applied skills, and develop tourism skills. Better serve the development of China's tourism industry.

Developing the practical training model of hospitality management in Chinese universities is complex. The state has recently adopted management strategies related to applied universities, optimized the applicable learning model, improved educational concepts, and formulated university development goals and specific application areas (T. E. Li & Chan, 2021). However, undergraduate programs face obstacles in their development and perpetuate traditional learning models. Regarding teaching philosophy, most tourism universities still need to update their teaching concepts and are dominated by conventional teachers. Secondly, in terms of the level of education, there are titles such as Bachelor's Degree,

Major, and Master's Degree. Still, there needs to be a distinction between certain types of practice and types of education. The physical environment, such as schools and institutions, limits some universities, resulting in overlapping disciplines and professional frameworks and a need for local identity (Bedoya-Dorado et al., 2021). Therefore, there is a need to update and optimize the Bachelor's degree program in hospitality management. Based on the influence of the above three factors, understanding the domestic demand of the tourism industry, the characteristics of the tourism industry, and the current situation of the practical learning methods of the Chinese Bachelor's degree in hospitality management, it is essential to study and optimize the practical learning methods of the Chinese Master's degree in hospitality management, and to continue to build and optimize the practical learning methods of the Chinese Bachelor's degree in hospitality management.

Currently, more research is focused on learning models in hospitality management, but research on practice-based learning models for Bachelor's degree in hospitality management is at an advanced stage. The theory of practice-based learning model helps to enrich meaningful experiences in this field.

This paper applies the theory of CDIO teaching techniques to the Bachelor's Degree Program in Hospitality Management to optimize the practice-based learning approach in the Master's Degree Program in Hospitality Management. The optimization of practical learning in hospitality management, guided by the theory of CDIO training, actively promotes the practical learning methodology of the applied course in hospitality management, which is essential for updating the learning methodology in other non-technical applied fields. On the one hand, it will help to improve the learning and practical teaching effect of the Bachelor's degree program in hotel management, improve the overall quality of students, improve their application skills, collaborative and interpersonal skills, and cultivate high-quality talents for joint travel. On the other hand, this also applies to the optimization and practice of non-technical learning models.

2. Background of the study

The CDIO theory comprises four phases: planning, programming, implementation, and operation. It is an innovative educational foundation for engineering training. The framework focuses on engineering training by providing students with fundamental ideas, projects, implementations, operating systems, and products (Pham et al., 2021). Project-based learning, active learning, and other methods contribute to developing an individual's knowledge, skills, qualities, and competencies. According to the CDIO theory, engineering students must graduate with four skills: theoretical knowledge, personal ethical skills, personal communication skills, and creative and entrepreneurial skills. Considering the social sector's

complexity, students develop practical and operational skills and specific operational mechanisms appropriate for professional development. The program requires that students have the opportunity to create a first-level indicator plan and its expectations. The CDIO Skills Development Plan is a goal supported by relevant experts guiding the CDIO theory. The CDIO Competency Indicator System combines the four Key Competency Indicators with more than 70 Intermediate Competency Indicators and more than 400 Maximum Competency Indicators to provide schools with the appropriate criteria and standards for evaluating the development of their students. The CDIO Competency Indicator System is a system of competency indicators for the development of students.

CDIO theory is instrumental and easy to use. Hypothesize one of the characteristics of CDIO theory: first macro design. The CDIO theory creates a comprehensive global model for engineering education—massive elimination of multidisciplinary barriers. The CDIO theory is a theory that develops experts from a systemic and micro perspective. Engineering education theory focuses on other curriculum systems, course designs, and learning objectives. Engineers trained under the guidance of CDIO theory are highly qualified social innovators with a broad range of theoretical knowledge, practical skills, and integrated experiential skills—second, built-in readability. The CDIO theory is a stakeholder measure of the effectiveness of engineering training in terms of relevant skills and quality of talent. It aims to develop practical and professional skills and, most importantly, teamwork, interpersonal skills, good professional skills, and training in ethics and labor standards. The purpose of CDIO theory is to allow students to master professional concepts, design, implementation, and operational skills while learning the foundations of their profession, obtaining a better education, and increasing their interest and initiative in learning to provide them with a solid foundation for their future studies and work with a solid foundation. Thirdly, the industry must be demand-oriented. Emphasizing the combination of theoretical knowledge and practical skills to cultivate qualified and excellent engineers who can adapt to the sector's development, CDIO theory requires students to combine their knowledge and skills with product development in a completely realistic social environment. Therefore, CDIO theory also puts high requirements and standards on engineering skills. Technical skills are enhanced and strengthened. At the same time, CDIO theory also requires actively listening to the industry's opinions, timely adapting to vocational assessment, and improving educational content and learning modes. The engineering training model based on CDIO theory can be combined with industrial and industrial development. The research logic of this study is shown in Figure 1.

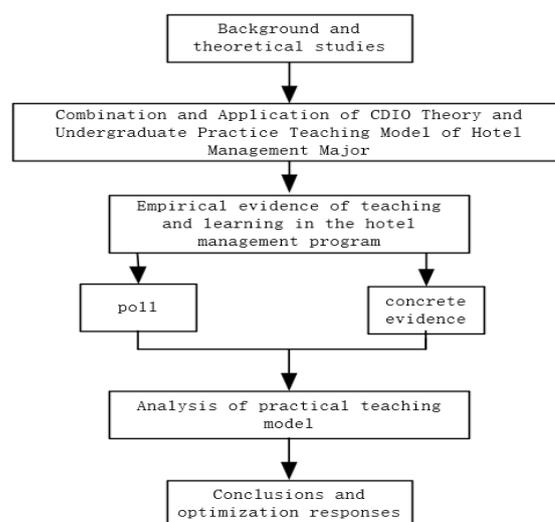


Figure 1 Research framework of CDIO education model of hotel management in the context of artificial intelligence and informatization

Since its inception, CDIO theory has been widely used in various disciplines and current fields with great practical and reference value. With the development of time and industry, the CDIO theory has been applied to technical areas and to forming ideas and models for the most practical talents. The authors of the CDIO theory recognize that engineering training should occur in other schools where teachers can learn and develop the teaching skills of their students. In China, educational reforms based on CDIO have been more widely implemented. As mentioned earlier, since 2005, Shantou University has taken the lead in fully implementing the Curriculum Design Department learning model(Chuchalin, 2021). With Shantou University as the leader, the CDIO learning model has rapidly gained national recognition, attracting 39 member institutions and influencing more than 200 member institutions. In addition, the CDIO learning model has become a critical educational program supported by the Chinese Ministry of Education. To this end, a CDIO research and training team of 18 universities was established to implement the CDIO learning model.

The team is supported and backed by the Department of Education at Shantou University, where all 18 university courses are Bachelor's degrees. Since 2009, the Pilot Institute has organized two sessions open to all - training and experience sharing. The CDIO learning approach is rapidly becoming more commonplace, with students from institutions nationwide with a history of more than 200 years participating. By 2012, the number of pilot installations had increased to 39. CDIO theory is increasingly being applied and practiced in the talent learning model. CDIO theory not only focuses on the effectiveness of theoretical learning but also emphasizes the effectiveness of practical learning and the development of students' overall quality, practical skills, and innovation skills. It can help Chinese universities solve the problem of prioritizing theory over practice in

the education model. It has been applied to many disciplines and fields in China, playing a positive role. However, CDIO theory started late in China, and its practical application still needs improvement and optimization.

3. Research methodology

3.1 Research process

This study focused on hospitality management students from freshman to senior year. All research models are from a northeastern university and are designed to learn about students' knowledge, observations, and practice skills in the context of the current practice-based learning model for a bachelor's degree in hospitality management. This paper examines the concept of non-curricular practical teaching and learning from the perspective of awareness of practical teaching and learning with hospitality management students, and practical skills (Cheng, 2009). A research project is the process or method by which a researcher answers a research question. A research project is the basis or plan of action for a study. This paper aims to study the optimization of Bachelor's Degree Training in Hospitality Management based on the CDIO theory using a combination of quantitative and qualitative research methodology collected from different respondents with relative ease (Koseoglu et al., 2022). The interview technique lets the researcher delve into the participants' brains and obtain detailed information and data.

As a research tool, a survey consists of questions designed to gather information from respondents. In addition, surveys are more cost-effective than other methods and can more accurately measure relatively large subjects' behaviors, attitudes, preferences, opinions, and intentions. Semi-structured interviews are conducted in a relative setting, allowing the researcher and respondent to engage in in-depth bilateral communication (Gaulke, 2022). A good semi-structured interview requires careful planning, including identifying the interviewee, determining the interview frequency, and preparing for the interview. Discussions are entirely voluntary, and every effort is made to protect the participants' privacy.

When assigning weights to the matrix of indicators X_{ij} , the first step is standardization, and neutral indicators are not considered in this study:

$$y_{ij} = \frac{x_{ij} - \min(x_{ij})}{\max(x_{ij}) - \min(x_{ij})} \quad (1)$$

Equation (1) is the matrix adverse indicator treatment;

$$y_{ij} = \frac{\max(x_{ij}) - x_{ij}}{\max(x_{ij}) - \min(x_{ij})} \quad (2)$$

Equation (2) is the matrix favorable indicator treatment; in the treatment of the upper to, the traditional medicine is used:

$$e_j = -k \sum_{i=1}^m p_{ij} \ln(p_{ij}) \quad (3)$$

The specific steps for the value of k in Eq. (3) are as follows:

$$k = \ln \frac{1}{m} \quad (4)$$

The specific steps for the p -value in Eq. (3) are as follows:

$$p_{ij} = y_{ij} / \sum_{i=1}^m y_{ij} \quad (5)$$

Data analysis is the process of interpreting data using the scientific method. Once collected, data should be organized, coded, and analyzed. Descriptive analysis was used to examine frequencies, standard deviations, and means. With the help of appropriate test methods, the relationship between basic practical training in hospitality management and students' practical skills was examined. If the standard is less than 2.5, the result indicates that the respondents disagree with the findings and vice versa. Correlation analysis was used to study the relationship between the dependent and multidimensional variables. Values below 0.05 indicate that the independent variables significantly affect the students' practical skills.

3.2 Statistical process and results

The leading information was obtained from 280 critical questionnaires. Table 4.3 shows the demographic characteristics of the respondents. Most respondents were females (73.57%) and males (26.43%). Based on these data, it was found that most participants were females, more than half. The highest response was found in the first year (31.07%), young (29.29%), old (29.28%), and the lowest in the second year (10.36%). The highest percentage of respondents was found to be between the ages of 20 and 30 years old (89.29%). In the second year, it was under 20 years (10%), then 30-40 years (0.36%) and then over 50 years (0.36%). Most respondents were between 20 and 30 years old, with very few students under 20 to 30 years old.

The main concentration of students in the hospitality internship program is in hotels (67.5%), followed by internships in tourist destinations (15%), and 10.36% of the students are in the field. The lowest was in travel agencies (7.14%), which implies that schools provide fewer training opportunities, and hotels are industries with high employee mobility, high employee requirements, and low employee training needs. Hospitality management students are preferred during their internships. Consequently, the number of trainees in travel agencies and tourist destinations has decreased, resulting in students with fundamental hospitality skills. Therefore, schools should provide students with a more diverse education to experience different work environments and content to develop the skills needed in the tourism market more effectively. At the same time, the employment

awareness of hospitality managers should be increased, and graduate migration should be reduced. The CDIO effect is shown in Figure 2.

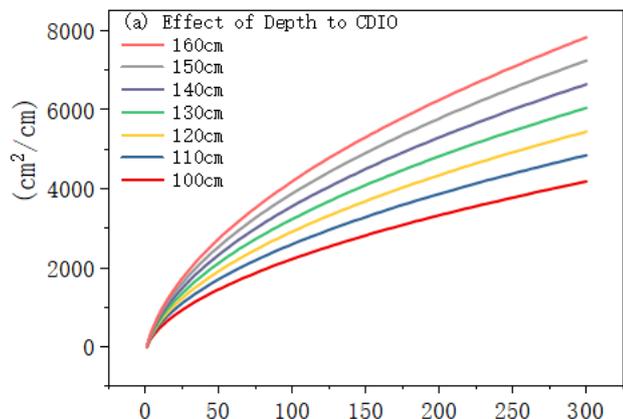


Figure 2 CDIO effect

The highest mean value was found when students had more opportunities for independent activities in the intensive learning program (mean = 3.71, standard deviation = 0.946), indicating that most schools surveyed provide adequate opportunities for students to engage in intensive learning. The second highest mean was "Students are more active in intensive campus programs" (mean = 3.63, standard deviation = 0.827). Providing students with more practical options means that most tourism universities could implement a helpful training model based on a bachelor's degree in hospitality management.

On the contrary, the lowest mean value was "Students' universities place more emphasis on creating and maintaining a dual-qualified hospitality management training team" (mean=3.31, standard deviation=0.965), indicating that students are not satisfied with the professional team of hospitality management instructors. (Mean=3.39, Standard Deviation=0.939) Some tourism universities still need to keep up with the current developments in the tourism industry in practical teaching on campus. Students must immediately put their training into practice and improve its relevance to the industry, which implies that students perceive practical courses on campus as less practical and adaptable, as well as after practical work. Therefore, tourism universities must continue to improve the depth and quality of practical education and establish good links between practical education on and off campus.

The first means: "Students' leisure activities are focused on professional training, while decentralized leisure activities are focused on basic service work (mean=4.09, SD=0.860)." Students studying hospitality management are more focused on orientation training outside the curriculum and decentralized training outside the educational field. (Mean=3.65, SD=0.926), and the third place goes to "large-scale training" organized by the university (Mean=3.63, SD=1.871). However, according to the survey, most students focus on basic and service training, which does not contribute to developing comprehensive practical and managerial skills of

hospitality professionals and needs to be improved to ensure high quality and efficiency. Students' Practical skills should be emphasized in developing professional, general, and hospitality management skills of students, schools, and companies to improve the quality and quantity of production skills and adapt to the development of the tourism market.

In addition, the lowest mean is: "Students have professional teachers to take care of and supervise activities outside the curriculum at appropriate times" (mean = 3.27, standard deviation = 0.829). The student believes that the assessment and evaluation of centralized and decentralized activities reflect the level of their practice" (mean = 3.36, standard deviation = 0.895). In other words, due to the perceived practice in the tourism sector, tourism satisfaction needs to be higher to meet the requirements for career choice. In addition, many universities must provide students with timely guidance and mentoring during their internships, resulting in a relatively coordinated process and scoreboards that do not match the students' actual performance to a large extent. Externships are a critical factor in determining whether tourists will be able to work and thrive in the tourism industry. Schools and businesses must constantly motivate and support students during their training by helping them develop career plans and describe their prospects to adapt to different tasks rather than consistently providing a low level of service, which applies primarily to developing students' intellectual and leadership skills. In addition, all internship outcomes should be evaluated to gain a sense of professional identity and reduce the impact of the training. The analysis of the effectiveness of teaching hospitality management in the context of information technology is shown in Figure 3.

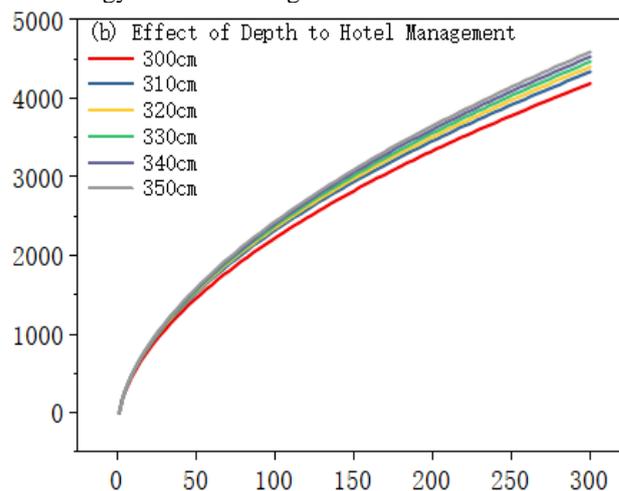


Figure 3 Effectiveness of teaching hotel management in the context of information technology

According to the statistics on students' learning and practice skills, the second highest mean, "students perceive that they benefit most from intensive and decentralized non-teaching practice" (mean = 3.47, standard deviation = 0.937), is "extensive professional experience in tourism." Students' leadership skills can be developed through intensive and decentralized practice"

(mean = 3.18, standard deviation = 0.895), "which differs from the goal of developing highly qualified and complex managers. Therefore, schools can extend the duration of internships for students, and companies should provide as many internships as possible, especially managerial positions, to improve students' thinking and leadership skills.

4. Results and discussion

4.1 Impact of CDIO on Hotel Management Teaching in the Context of Artificial Intelligence and Informatization

CDIO theory is a systematic engineering training theory that provides a framework and function for optimizing the practical methods of hotel management. It can deepen the integration of theoretical knowledge and practical application by the standards and requirements of CDIO theory and has an essential academic role in improving students' practical work and problem-solving ability (Chen, 2021). Teachers also play a vital role in hospitality management practical training. Secondly, developing CDIO theory in a location-based learning environment focuses on creating the best practice environment for students. A bachelor's degree in hospitality management requires higher physical environment requirements, such as hospitality facilities and targeted professional training both on and off campus (Sun, 2022). The pedagogical concepts and standards of the CDIO learning space and the vision of practice-based learning must consider the location and context of the practice-based education, i.e., "practice-based learning" physical environment. The emergence of CDIO training theory fulfills the requirements for teaching hospitality management practice in this field.

Thirdly, CDIO theory calls for a change in the previous individual and official assessment criteria, an increase in the student assessment process, and the development of comprehensive assessment criteria. Hospitality management practical training is conducted in stages, in a consistent and complex manner at each level, with different standards and requirements, as well as content and form of assessment. Therefore, assessing and evaluating the overall quality of students' knowledge structure and practical skills at each stage is essential. Only a comprehensive evaluation and analysis can be conducted at all locations within and outside the school (Rasheduzzaman et al., 2021). It is necessary and feasible to provide a practical mode of training in hospitality management according to the characteristics of the bachelor's degree in hospitality management. The university has developed a curriculum for the hospitality industry and modified it. The content of the curriculum emphasizes the development of knowledge and skills, the organic integration of theory and practice, and extracurricular and curricular learning. Practical training in hospitality management tests the effectiveness of theoretical understanding and emphasizes the significance

of practical knowledge. The impact of Internet technology on teaching hospitality management is shown in Figure 4.

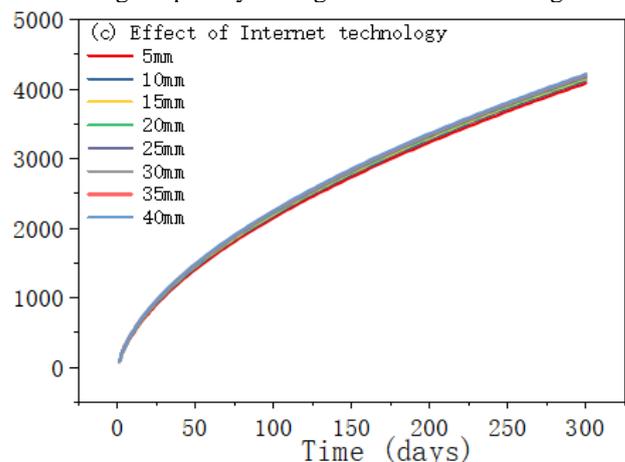


Figure 4 Impact of internet technology on teaching hospitality management

Based on the requirements and criteria of the CDIO theory, more and more national and international disciplines are choosing the CDIO engineering training theory as a guide to improve their literary competencies. The CDIO theory can provide in-depth guidance at different levels of design, devising, implementation, and operation. Based on the current state of practical education related to the Bachelor's degree in Hospitality Management, the CDIO theory is well-networked and applied to the legal aspects, learning objectives, and critical aspects of the Master's degree in Hospitality Management. Various approaches exist to develop highly qualified individuals with ideal and most effective theoretical and practical models. Theory and practice are closely coordinated, and the teaching content is closely related to theory and practice. According to the academic requirements of the Bachelor of Hotel Management degree, the educational needs include theoretical foundations, applied professional knowledge, and practical aspects. From practical learning in concentrated degree studies to helpful practice in the main subjects during practical wisdom, the areas of research and practice are combined with learning objectives that are close to the needs of the industry. Students learn and practice theoretical and professional skills in companies and other relevant sectors. As a result, graduates of the University of Tourism can become highly qualified specialists with specialized skills, market needs, tourism industry, and development potential. According to CDIO's theory of authenticity of work environments, learning experiences and applying practical actions in natural work environments can improve complex practical skills. Real practical experience can be gained continuously by using knowledge and skills in practice, analyzing, and solving real problems.

Further training in hospitality management is practical training activities in simulated work environments, including competence translation, problem-solving training, professional awareness training, teamwork

training, and personal communication training. They align with the theoretical objectives of CDIO, which is the culmination of the training process for talented young people with a bachelor's degree in hospitality management, which is now better suited to the growing needs of the multidisciplinary, integrated manufacturing industry. The core of the CDIO concept addresses the basic training requirements of hospitality management through the learning process of hospitality management practice. It can contribute to the reform of the Bachelor's Degree Program in Hospitality Management in terms of educational objectives, the content of learning, place of learning, enhancement of teachers' teaching skills and assessment of student's skills, and help to optimize the practical learning model(Ritchie & Jiang, 2021). The CDIO theory is based on problem-solving in the experimental learning phase. Teaching should focus on improving students' conceptual skills, practical application, and creative skills to increase students' interest in learning. The CDIO theory guides the teaching and learning tasks at different stages of the program, where students implement what the students know in practice and lead to meaningful changes in learning objectives, methods, and systems to adapt to hospitality management's teaching and learning practices—ensuring consistency between practical and hands-on training(B. Liu et al., 2021).

In conclusion, CDIO training theory can provide necessary guidance and role in optimizing the practical learning of a Bachelor of Hospitality Management in line with optimizing the practical knowledge of a Bachelor of Hospitality Management. The application of CDIO engineering education theory has an essential functional role in developing the Bachelor of Hospitality Management degree system, a practical learning approach that aligns with the current state of the Bachelor of Hospitality Management course preparation. The impact of significant data factors on hospitality management teaching and learning is shown in Figure 5.

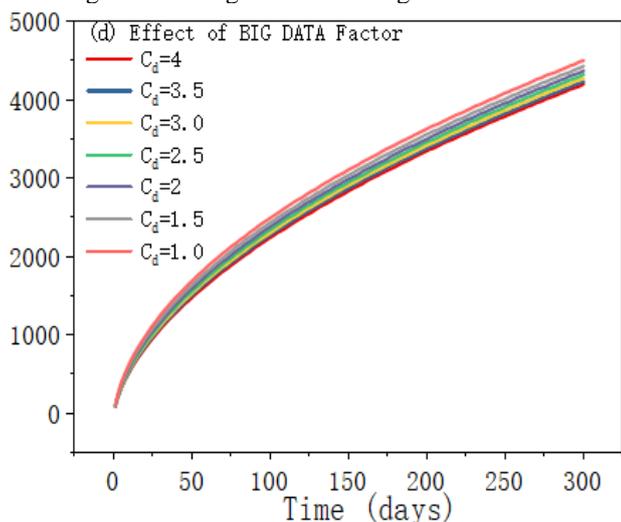


Figure 5 Impact of Significant Data factors on teaching hospitality management

4.2 The guiding role of CDIO on hotel management teaching in the context of artificial intelligence and informatization

First, the CDIO theory emphasizes complexity. With the application and development of CDIO theory, there is an increasing number of applied specialties in medicine, manufacturing, biology, and education, which means that the application of CDIO theory is comprehensive and practical. Based on this theory, non-technical education disciplines can also conduct research on optimizing teaching practices, curriculum reform, and instructional development. Empirical research shows that applying CDIO theory to professional practice learning can effectively solve some practice learning problems and promote the updating and optimizing practice learning in hospitality management colleges and universities(K. C. Li & Wong, 2021). Enriching the content and form of practical education in hotel management with a bachelor's degree helps improve teachers' teaching skills, students' practical skills, and overall quality. Secondly, CDIO theory emphasizes the combination of theory and practice. At present, there are some deficiencies in the primary education of hotel management, which leads to an imbalance between students' theoretical knowledge and practical skills in the process of practical learning that is closely related to teachers' teaching skills and educational concepts(Fjrtoft & Sandvik, 2021). The experimental learning model based on CDIO theory and CDIO theory emphasizes the balance between theoretical knowledge and practical skills development, improving teaching skills and changing teaching concepts. At present, optimizing the functional training mode of China's hospitality management bachelor's degree meets the theoretical criteria of CDIO. Therefore, applying CDIO theory to hotel management practice teaching is a feasible way to enrich the content of hotel management practice education, promote the overall development of students, improve the training level of teachers, and better promote the renewal and optimization of hotel management bachelor practice. Finally, the CDIO theory is given. There is a difference between theoretical and practical skills in the practical training of hotel managers. Applying the CDIO theory to the practical training of the Bachelor's Degree in Hotel Management is a topic worth studying. The purpose of the CDIO theory is to enable the reconstruction and development of the relevant content activities by the characteristics of the hotel and the direction of the research management. Applying the theoretical experience of CDIO to the practical training of engineering training in the field of hotel management will not only solve the problem of the development of teaching methods of hotel management in higher education but also increase the motivation of students to learn and develop social skills. Improve the quality of hotel management. In summary, CDIO theory can be used to optimize the Bachelor's degree in hotel management with

solid theoretical significance. The three paths of hotel management teaching quality are shown in Figure 6.

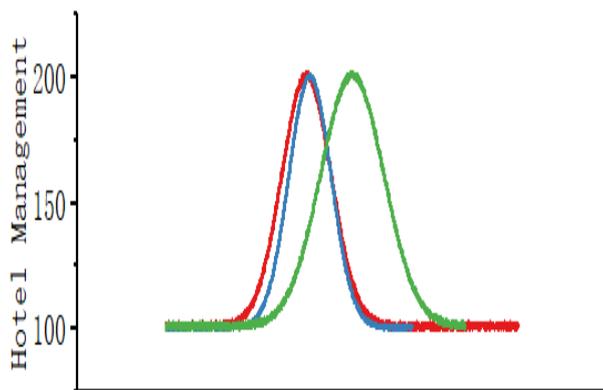


Figure 6 Three pathways of teaching quality in hotel management

Applying CDIO theory to the conception, design, implementation, and operation of a practical learning model for a bachelor's degree in hospitality management required a detailed separation of the different aspects of the experimental learning model, the identification of problems, and the optimization of the current approach to practical learning for a bachelor's degree in hospitality management. Targeted training recommendations for complex applications provide a relatively ideal form of training for hospitality management practice. A bachelor's degree in hospitality management can be implemented in three ways: learning objectives, standards, and industry requirements. Firstly, in terms of educational purposes, it is necessary to define the educational goals of a bachelor's degree in hospitality management, which is a prerequisite for practical training and even affects the overall quality and development of the tourism industry. Tourism schools should pursue this objective when developing their curricula. Secondly, the learning standards are the objectives achieved by the practical training of the hotel management program at the University of Applied Sciences. They form the basis for learning and practicing the internal and external practices and standards students must adhere to in the learning process. There are strict rules on format, content, practical teaching methods, faculty, equipment and environment, and assessment. Current tourism universities need to develop training standards for each module and level. After all, tourism is a fast-growing sunrise industry with many potentials and promising development environments, and the tourism industry is also showing a trend of interdisciplinary integration. With a more diverse demand for tourism professionals in the tourism industry, the primary practical model of hospitality management needs to analyze the needs of the industry and train older tourists who can integrate into the market. The planning process of practical learning related to a bachelor's degree in hospitality management should include developing learning content, information structure, and learning methods. First, the design of educational content.

Learning content design must consider the students' unique characteristics by analyzing their initial level, cognitive structure, learning attitudes, and motivation. Then, it continues with the core hospitality management curriculum, exploring how to acquire some theoretical core modules and practical skills modules of hospitality management, selecting knowledge points and presenting knowledge and skills, and giving and offering achievable practical knowledge and skills. More proactive student education is the focus that should be given to hospitality students—secondly, data structure. The design of the information structure consists of two primary levels: the structure of the information content and the presentation of the content.

Information structure refers to the relationship between theoretical knowledge and practical skills in a bachelor's degree program in hospitality management. Content presentation refers to presenting the best quantitative information by designing guidelines. This paper examines the optimization of practice in teaching the Bachelor's Degree in Hospitality Management using the Bachelor's Degree in Tourism as the object of study. Thirdly, teaching methods must be developed. Regarding teaching methodology, BSc in Hospitality Management teachers need to change the traditional teacher-centered approach, motivate students to learn and participate in the classroom and use new and more effective teaching methods such as situational experiences, thematic analysis, and project approach. At the same time, modern information technology should enrich the classroom teaching content, use the results of teaching information technology, improve teaching practice, create an attractive classroom atmosphere and environment, and improve the traditional practical teaching mode. The three paths of tourism management teaching quality are shown in Figure 7.

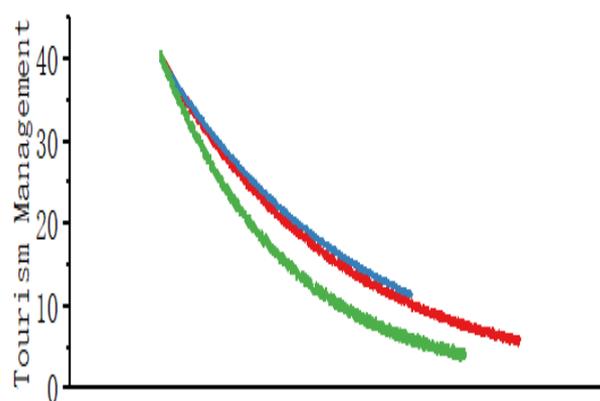


Figure 7 Three paths of teaching quality in tourism management

One of these is teacher development, which includes pedagogical skills (theoretical knowledge, practical skills), teaching methods, and use of teaching materials. According to the criteria and linkages of CDIO theory, teacher skills are a critical factor in achieving effective teaching and learning. Higher education institutions in the tourism industry should increase the number of experienced faculty and provide greater flexibility to

attract faculty, especially from part-time companies. Frontline staff should ideally work full-time in hotels, tourist destinations, travel agencies, and other establishments. Including faculty with higher practical skills in practice-based learning groups would help adopt a practice-based learning model and ensure the quality of practice-based learning. Financial support is also needed. Economic issues are an essential aspect that affects the effectiveness of practical teaching methods in hospitality management programs.

Hospitality management, an efficient orientation, requires proper laboratory systems and platforms during practical training. In addition, financial support is needed to train teachers. Currently, the primary source of funding for schools is funding, which depends on the political and professional position of the school and is very coherent. The profession of a hotel manager is closely linked to tourism companies. It invests in practical training through "basic training institutes" that collaborate in various forms with industry, science, and research to ensure the safety of teachers, institutions, and equipment. Implementing the Bachelor's Degree Training Model in Hospitality Management is the final step in developing a training model based on the CDIO theory. It aims to ensure operational efficiency and measure the effectiveness of the entire practical learning process. Assessment and monitoring of the experimental learning process is critical.

The first issue concerns assessment criteria and systems. The system for assessing the quality of teaching and learning in practice management at tourism universities is complex. It includes the design of the practice learning model, a range of planning, implementation, and operational assessment. It reflects the overall teaching and learning process in the bachelor's degree in hospitality management. There is also a need to assess and identify the location and content of practice teaching on and off campus to determine the equipment and materials in on and off-campus facilities and how well they meet the needs of the tourism market. Practice learning assesses the integrity of the management mechanism of practice learning, the effective monitoring of the process of practice learning, and the quality of practice learning outcomes, including the assessment of faculty management and guidance. Therefore, practical evaluation of teaching can be categorized into the level of practical skills, operational efficiency, teamwork, compliance with management principles, and incredibly innovative management rules. Company teachers and helpful instructors usually carry out assessments of functional training. Assessment methods should be diversified, and the assessment process should aim to improve students' self-confidence and self-learning ability. The second is natural learning management and guidance. To standardize practical training, it is necessary to establish a scientific-practical and documentation management system and develop practical curricula, programs, and implementation plans. Only by adequately monitoring and supervising all aspects and stages of the

school's centralized internship program, extracurricular professional concentration, and professional practice in the workplace can people ensure that baccalaureate education is always received in hospitality management practice. The coupled relationship between the hospitality and tourism management programs is shown in Figure 8.

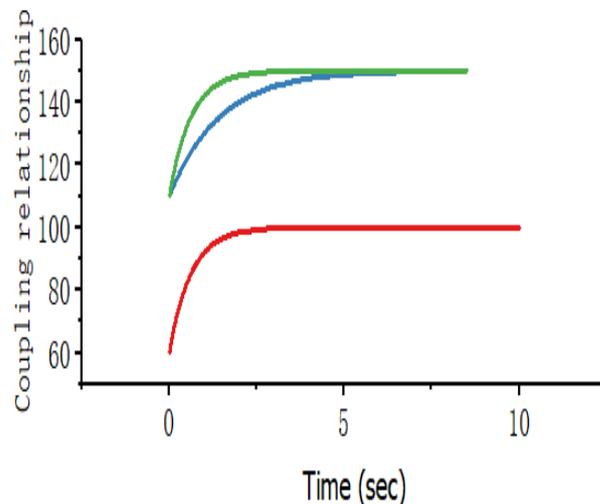


Figure 8 Coupling relationship between hotel management and tourism management programs

5. Conclusion

The current status and fundamental theories of the CDIO bachelor's degree program in hospitality management practice were understood through research and literature analysis. Based on the CDIO theory, the most common practice teaching models in hospitality management schools are analyzed, data from student surveys and faculty interviews are analyzed, and strategies to optimize the primary degree in hospitality management are proposed. The paper discusses the concept and content of practice learning, the concept, and criteria of CDIO, the practice learning model for a bachelor's degree in hospitality management, and the theoretical direction and feasibility of building a practice learning model for a bachelor's degree in hospitality management based on CDIO theory. Reference to the importance of values and leadership in combination with progressive learning, curriculum renewal, and course design. Statistical analysis software SPSS 26.0 was used to describe and analyze the survey data. The study showed that hospitality management students had an above-average overall understanding of on-campus practical learning, off-campus practical learning, and self-study skills. The interviews were analyzed, including textual analysis of the interview results, knowledge of the school's current approach to practical learning and CDIO hospitality management theory, teaching methods and course of study, and similar optimizations.

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