

## STEAM Display Path for Tourism Management in Era of Industry 4.0

Yi Zhao<sup>1,\*</sup>

<sup>1</sup> Zhengzhou Railway Vocational and Technical College, Zhengzhou 451460, Henan, China

### Abstract

**INTRODUCTION:** Tourism management is a critical factor in developing quality human resources. Establishing a scientific and practical system to assess the quality of tourism management and identify and improve problems in tourism management is essential to ensure the quality of tourism management and realize human development goals.

**OBJECTIVES:** In order to solve the current problems of China's tourism management, such as weak teachers, STEAM being too "soft," and leadership being too "hard," the concept of STEAM distance learning, literature analysis and other research methods are proposed, and the quality assessment system of tourism management for the bachelor's degree in tourism management is researched in the standard documents of education and management and related literature.

**METHODS:** Established through interviews with qualified experts, tourism teachers, tourism professionals and others. Factor analysis was used to adjust the system of indicators for tourism students and define an evaluation system consisting of level 1 and corresponding level 2 indicators to determine the weights of the indicators.

**RESULTS:** The results show that students are satisfied with "average" internships. The lowest level of satisfaction was with the "evaluation of the training process," but this indicator was the highest. Further analysis of the results suggests insufficient investment in professional practice in tourism management.

**CONCLUSION:** This paper argues that the empirical research and analysis of the current tourism management students can be used to understand the accurate evaluation of tourism management activities based on the solution of the existing problems to improve students' innovative and practical abilities.

**Keywords:** STEAM, tourism management, industry 4.0, display path, evaluation system

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\*Corresponding Author. Email: zhaoyihello@163.com

### 1. Introduction

The level of science and technology affects the rise and fall of a country, and the strength of innovation directly determines the fate of a country. In today's world, scientific and technological innovation is crucial to improve global competitiveness, but it must be innovative enough to provide reliable intellectual support. This is why talent development is at the heart of global competition (J. et al., 2021). Other countries worldwide have taken STEAM to a new level by emphasizing multidisciplinary learning and implementing policies

aimed at developing innovative skills to meet the needs of society (Sigala, 2021). In recent years, Chinese education has shifted to high-quality development as information technology continues to mature and improve. STEAM and tourism management are the forerunners of a comprehensive reform of the technical education system in order to improve international competitiveness and develop innovative skills that can quickly adapt to technological developments. Teachers and faculty teach most STEAM content through simple craft courses. STEAM needs to ensure that different information systems work through practical innovations.

This paper argues that tourism management in China suffers from weak teachers, too much STEAM "softness," and too much leadership "hardness." Lack of educational resources, knowledge fragmentation, and a robust tourism management environment make tourism management a serious bubble and bottleneck. Based on this, the STEAM tourism management program plans and implements practical research, using bibliography, interviews, questionnaires and learning experiences to improve students' innovation and practical skills while solving existing problems. Tourism management is critical in developing highly qualified personnel (Malonda, 2021). Establishing a scientific and practical system to assess the quality of tourism management and to identify and improve problems in tourism management is essential to ensure the quality of tourism management and to achieve human development goals.

This paper proposes the STEAM distance learning concept, literature analysis and other research methods. The tourism management quality assessment system for the bachelor's degree in tourism management was established through interviews with qualified experts, teachers, and professionals based on educational management standards documents and relevant literature studies. Factor analysis was used to adjust the indicator system for tourism students, and an evaluation system consisting of level 1 and corresponding level 2 indicators was defined to determine the weights of the indicators (Al, 2021). Finally, an empirical study and analysis of current tourism management students was conducted to understand the accurate evaluation of tourism management activities.

In the remainder of the paper, firstly, a specific assessment of the independence and complexity of the related work is made, and the STEAM principles are further discussed; secondly, the problem hypothesis and model of the article are introduced in the research methodology, and the data collection work is presented; finally, the experimental results are justified in many aspects.

## 2. Related work

Complexity refers to the complexity and completeness of the evaluation indicators and the importance of the selected indicators. When selecting indicators, the indicator framework should be ensured to cover all factors affecting the evaluation topic (van ZylChristelle, 2021). Secondly, according to the aggregation principle, some hard-to-reach, non-representative and irrelevant factors should be removed to make the data in the indicator framework more realistic and representative.

Independence implies clarity, repetition and independence of performance indicators. Classification refers to the integrity of the entire indicator system and the integrity of the indicators at each level. It focuses on the logic and relationships among indicators. Therefore, when establishing the practice learning evaluation system, the

indicators should have precise meanings and independence, should not be confused with other indicators, and should not cause semantic ambiguity, reference ambiguity or other problems. Practical training in tourism management is a very complex project, and practical training is not only limited to schools but is an integral part of the social environment. Therefore, it is necessary to take a systematic approach and develop an evaluation system that covers the whole process so that a limited number of indicators can be fully utilized to evaluate the complex system. Within the framework of the evaluation system, evaluation indicators should cover all aspects of professional practice in tourism management at all levels to assess the link between all learning activities and teaching activities.

In addition, a system for assessing the quality of STEAM practice based on distance learning must respect the above principles and incorporate the practical characteristics of the industry. To effectively review the current status and challenges of Bachelor of Tourism Management education and to propose targeted funding strategies. Based on the IPPC theory and the basic principles of quality assessment of practice teaching and learning, as well as the factors affecting the whole process of practice teaching and learning, 12 secondary indicators are identified, such as the objectives, concepts, resources and content of practice teaching and learning, taking into account general and individual needs, the processes and outcomes of the students being assessed (Guzeloglu & Gulc, 2021). The theoretical assessment of authentic contexts will highlight the elements of the indicators. The purpose of the contextual assessment is to identify the environment related to the bachelor's degree in tourism and to explain the reality related to the environment (Matarneh et al., 2022). Therefore, we choose "practical learning objectives," "practical learning philosophy," and "practical learning plan" as performance indicators, the most important of which is to clarify the practical learning objectives of tourism management training. Learning objectives. It is essential to understand the feasibility of the practice program, the learning objectives and the importance of the school in practice learning.

## 3 Research Methodology

### 3.1 Problem and Modeling

Since STEAM and travel management are still in their early stages and have yet to be developed, STEAM and travel management policies are inflexible without project management. A comprehensive literature analysis revealed that necessary theoretical research is much more important than empirical research and that existing learning cases need systemic funding. Further training of STEAM teachers or full-time travel managers was found, and the study found that serious problems still need to be solved in curriculum implementation.

The development of a STEAM-based travel management program provides a solution to these problems. Combining STEAM and travel management is the best way to balance soft and complex issues. On the other hand, the technical requirements of access management allow you to optimize and improve STEAM content. On the other hand, STEAM can rely on the travel management curriculum to fully integrate multiple disciplines in a "creative" way so that students can promote understanding of real-world abstract concepts in science, technology and other disciplines. One lends itself to pre-configuration, the other to production. In short, combining STEAM and travel management is an effective way to develop the skills needed during this period.

- (1) Where is the interface between traditional material knowledge and STEAM use management?
- (2) How are curriculum objectives and content determined When STEAM management is combined with travel management?
- (3) How to develop a STEAM-based travel plan?
- (4) How can the impact of STEAM-based travel management programs be evaluated?
- (5) How practical is STEAM-based travel management training?

STEAM integration into travel management is still in the early stages of research, and there needs to be a scientifically viable curriculum to learn and create. Training activities and related implementation strategies must also be standardized. These issues make it challenging to integrate STEAM and travel management. To facilitate the integration of the study, two research objectives were listed in this study: first, to examine the need for and the development process of a STEAM travel management curriculum (Ali et al., 2023). Second, a STEAM-based tourism management curriculum was developed and applied to teaching practices to enhance the multidisciplinary application of students' innovative knowledge and skills. By combining "learning, thinking, movement and creativity," students can achieve holistic development.

$$STEAM(Y_{jit} = 1 | X_{it}) = STEAM(\alpha \ln Dj + X_{jit}\beta + \omega_{jit} > 0 | X_{jit}) \quad (1)$$

Formula (1) illustrates the efficiency of distance education in the STEAM model, where the first two are the main parameters and the random perturbation term.

$$Y_{jit}^* = \alpha \ln dex_{jit} + X_{jit}\beta + \omega_{jit} \quad (2)$$

Equation (2) illustrates the specific method of STEAM statistics. Although there is a discrepancy with Equation (1), the number of terms is consistent with the theory of Equation (1), and the results still converge.

$$Y_{jit} = \max(0, Y_{jit}^*) \quad (3)$$

Formula (3) introduces the specific selection method for the calculation.

### 3.2 Indicator system establishment

Complexity refers to the complexity and completeness of the evaluation indicators and the importance of the selected indicators. When selecting indicators, it should be ensured that the indicator framework covers all factors that affect the evaluation topic. Secondly, according to the principle of aggregation, some factors that are difficult to reach, unrepresentative and irrelevant should be removed to make the data in the indicator framework more realistic and representative.

Table 1 Contextual part of practice teaching in the evaluation system

First-level indicators	Secondary indicators	Observation point
Practical teaching background	Target	Objective clarity
		Students' understanding
		Student identification degree
	idea	School cognition
		Scientific concept
plan	feasibility analysis	

Independence means clarity, repeatability and independence of performance indicators. Classification refers to the completeness of the entire indicator system and the completeness of the indicators at each level. It focuses on the logic and relationship between indicators. Therefore, when establishing the practice learning evaluation system, the indicators should have precise meanings and independence, should not be confused with other indicators, and should not cause semantic ambiguity, reference ambiguity or other problems. Practical training in tourism management is a very complex project, and practical training is not only limited to schools but is an integral part of the social environment. Therefore, it is necessary to take a systematic approach and create an evaluation system that covers the entire process so that a limited number of indicators can be fully utilized to evaluate the entire complex system. Within the framework of the evaluation system, evaluation indicators should cover all aspects of professional practice in tourism management at all levels to assess the link between all learning and teaching activities.

Table 2 Practical teaching input component of the evaluation system

First-level indicators	Secondary indicators	Observation point
Practical teaching investment	Teachers	Teacher resource structure
		The number of teachers in the country is increasing.
		Teacher refresher
	Capital and material resources input	School Investment
Number of		

		practice bases
		Enterprise participation
		Abundance of equipment types
	Organizational guarantee	Equipment utilization
		The completeness of the system
		Content practicability

According to the theory, the content and structure of evaluation indicators are scientific and reasonable, the evaluation conclusions are interpretable, and the role of evaluation indicators means that the evaluation indicators are measurable. Therefore, establishing a system for evaluating the quality of vocational training in tourism management must follow the objective laws of the professional development, adapt to the needs of the development of the market economy, and strive to improve the quality of tourism management graduates and promote professional development. The choice of indicators should also be based on the objective reality and characteristics of the University and its field of study, generating short and practical indicators. In short, simple and feasible performance indicators reduce the workload and challenges and provide the necessary conditions for assessment.

Table 3 The practical teaching process part of the evaluation system

First-level indicators	Secondary indicators	Observation point
Practical teaching process	Practical teaching content	Proportion of theory and practice
		Content practicability
		Rationality of course schedule
	Teacher teaching	Teacher's experience
		Professional characteristics of teaching
	Student learning process	Time to participate in practice
		Attitude to participate in practice

In addition, a system for assessing the quality of STEAM practice based on distance learning must respect the above principles and consider the industry's actual characteristics. The current situation and challenges of tourism management bachelor education are effectively reviewed, and targeted funding strategies are proposed.

Based on the IPPC theory and the basic principles of quality assessment of practice teaching and learning, as well as factors affecting the whole process of practice teaching and learning, 12 secondary indicators were identified, such as objectives, concepts, resources and content of practice teaching and learning, taking into

account general and individual needs, processes and outcomes of the assessed students.

Table 4 The part of practice teaching results in the evaluation system

First-level indicators	Secondary indicators	Observation point
Practical teaching achievements	Teaching assessment	Diversity of assessment forms
		Practicality
	Improvement of students' quality	Professional knowledge
		Professional skills
	Social recognition	Recognition of the school

The theoretical assessment of the actual context will highlight the elements of the indicators. The purpose of the contextual assessment is to identify the environment related to the bachelor's degree in tourism and to explain the reality related to the environment. Therefore, we have chosen "practical learning objectives," "practical learning philosophy," and "practical learning plan" as performance indicators, the most important of which is to specify the practical learning objectives of tourism management training. Learning objectives. Know and understand the feasibility of the practice course, the learning objectives and the importance of the school in practice learning.

Investment indicators will be used for practice training. The purpose of assessing participation is to evaluate the feasibility of resources and conditions for practical training activities to determine the scientific nature of practical training activities and establish the material basis for their effective implementation. Therefore, we have chosen "teacher strength," "financial and material investments," and "organizational support" as sub-indicators of investment assessment. Investment in financial and material resources will ensure the proper development of vocational training in the tourism sector, including investment, equipment and physical conditions. Organizational support includes the benefits of relevant laws and regulations, the soundness of management methods and scientific organization, and the definition of operations.

Performance indicators are extracted from practical learning. The tourism management practice training process was evaluated based on tourism management courses and practice training activities using four indicators: "practice teaching content," "teacher training," "student learning process," and "pedagogical assessment." The authentic content indicators are the ratio of authentic and theoretical learning, the practical applicability of the learning content and the importance of the professional characteristics of the learning content. The indicators of teaching include the rich experience of teachers, the approach emphasizing professional qualities and the development of students' skills. Indicators of the student learning process are mainly the time and attitude of actual student participation, the acceptance of student knowledge

and practical skills, and indicators of learning achievement of crucial assessment methods and criteria. The main reason is that many students believe that assessment methods and standards affect interview learning.

Indicators of actual learning outcomes. Assessing the effectiveness of practice learning includes assessing and evaluating the quality of practice learning and assessing overall student development. Thus, the sub-indicators "student quality improvement" and "social recognition" assessed students' professional knowledge, skills management, and economic and social satisfaction. The study collected data through a questionnaire and reviewed the structure of the first four indicators, the twelve indicators and the 37-level three-tier indicator framework to ensure its high applicability and reliability.

### 3.3 Evaluation results of data collection

Based on the model and mathematical theory, a comprehensive assessment of the different indicator levels not clearly defined in the study was carried out with the help of a fuzzy overall assessment method and the development of an assessment method. The integrated uncertainty assessment method has the advantages of quantitative and qualitative assessment and the advantages of a comprehensive assessment of complex events or phenomena. Therefore, the fuzzy integrated assessment method is particularly suitable for evaluating the quality of highly uncertain teaching practices (Hotel & Tourism Management, 2021).

This study developed a questionnaire based on an established system of indicators, allowing students to answer each question through subjective emotions and disseminate it to students through statistical and analytical survey data. It presents the experience and quality assessment of practical education of tourism students, reviews the scientific and feasibility of the indicator system established by the University and proposes targeted measures to improve the quality of practical education. Survey methodology is a research method that collects, processes and analyzes respondent data in written or electronic form from a pre-structured survey. The research method is applied in two main ways: first, to understand students' innovation levels and practical skills through a pre-course survey; the questionnaire helps us to understand students' attitudinal changes, knowledge acquisition, innovation trends and practical skills before and after STEAM tourism management training (Tahiri et al., 2021). SPSS allows you to analyze valid survey data before and after the course to assess the impact of the course implementation and to see if the course implementation is effective in improving students' creative thinking and practical skills. Analyze the survey questions based on the findings and make recommendations for other related research. The following statistical models were measured after SPSS statistical analysis:

$$r^f = \sum_{i=1}^3 \omega_i r_i + \ln drx_{gi} \quad (4)$$

Equation (4) implies that the STEAM efficiency value is proportional to the network level, and DRX is the random interference term that reduces the level.

$$\sigma^f = (w_i' \sum^f w_i)^{\frac{1}{2}} \quad (5)$$

Based on the STEAM program, a school tourism management plan was developed to implement and execute the educational experiment and to collect the data collected and processed in the test to test the feasibility of the program and the hypothetical research objectives.

### 3.4 Data collection process

The criteria for assessing the quality of practical teaching in the field of tourism management were selected based on standard documents, documents from educational institutions and interviews. Based on these factors, a prospective survey was conducted to assess the quality of authentic learning in the Bachelor of Tourism degree. The study focused on 340 questionnaires distributed to licensed students in the field of tourism management, and 331 were collected. The questionnaire removed incorrect questionnaires, and 314 significant questionnaires were received, with a valid response rate of 92.35%.

## 4. Experimental results

### 4.1 Reliability measures of STEAM-based teaching data for tourism management practice

Reliability analysis is mainly used to check the stability and reliability of the measurement results. Before analyzing the survey data, it is necessary to check the validity of the survey in order to verify its scientific validity and the accuracy of the results. Currently, reliability is tested using the alpha-Kronbach coefficient. If the coefficient is in the range of 0,8,1,0, then the reliability is high if the coefficient is in the range of 1,7,0,8. Reliability should be accepted if the coefficient is between 0,6,0,7; if the ratio is less than 0.6, the questionnaire design has serious problems and needs to be redesigned. The reliability of the questionnaire was analyzed using SPSS25.0 software, and the results were as follows.

(1) Reliability of STEAM teaching from the perspective of tourism management background

Based on the analysis in Table 5, it can be concluded that the Cronbach's alpha ratio used to measure the practical assessment of contextual learning is 0872, and after removal, the alpha ratio for each element is less than the initial ratio of 0872, and the correlation coefficient corrected for each element is more significant than 0.5, i.e., The measurement of the practice context assessment

is highly reliable. It can support the seven practice context assessment measurement stations.

Table 5 Credibility measures of STEAM distance learning contexts

Serial number	average value	variance	Correction coefficient	Alpha coefficient	Initial beta coefficient
Da	19.63	27.63	548	584	964
Db	19.82	29.633	593	639	
Dc	19.28	30.361	681	841	
Dd	19.96	28.634	741	489	
De	20.36	28.96	268	825	
Df	18.99	24.365	963	365	

(2) Reliability of STEAM teaching input perspective from a tourism management background perspective

As shown in Table 6, the Cronbach alpha coefficients used to estimate the measures of practical learning input 0943 are between 0,8 and 1,0, the alpha coefficient of each element after removal is less than the original value 0940, and the correlation between each element after correction is more significant than 0,5, which indicates the answer: the reliability of the assessment of practical learning input is very high so that the 12 assessments of practical learning input can be maintained indicators.

Table 6 Credibility measures of STEAM distance learning school inputs

Serial number	average value	variance	Correction coefficient	Alpha coefficient	Initial beta coefficient
Dg	36.65	99.617	617	412	641
Dh	35.61	98.631	483	741	
Di	38.41	99.418	214	954	
Dj	33.95	96.328	963	825	
DK	39.61	98.621	514	841	

(3) Reliability of STEAM teaching process perspective from a tourism management background perspective

Based on the data in Table 7, it can be determined that the actual alpha-clone Bach ratio used to measure learning achievement is 0933, and after removal, the alpha ratio of each element is less than the initial value of 0933. The correlation coefficient corrected for each element is more significant than 0.5. Note: The measurement reliability of the actual learning process assessment is very high, and the thirteenth measurement element of the assessment of the practical learning process can be retained.

Table 7 STEAM test of the teaching process

Calculated	ScaleValue	Scalarvariance
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ordinal number		
Dl	39.62	99.631
Dm	38.69	103.364
Dn	37.62	105.362
Do	40.36	98.362

(4) Reliability of STEAM teaching outcome perspective from a tourism management background perspective

The data showed that the initial measurement of the actual learning achievement assessment was  $\alpha 0.889$ , the  $\alpha$  coefficient was lower than the initial coefficient of 0.8 to 1.0, and the  $\alpha$  coefficient of 0.889, and the correlation coefficients of the changes of each element was more significant than 0.5, indicating that the reliability of the actual learning achievement assessment measurement was high. The five actual measurement elements of the assessment can be retained.

### 4.2 Measurement analysis of the teaching effect of tourism management based on STEAM

This section focuses on the teaching practices of tourism management, collecting relevant information during the course and analyzing the impact of STEAM-based professional development in tourism management using SPSS data analysis software and other tools. Qualitative and quantitative assessments included four components: assessment and analysis of student academic performance, analysis of student academic achievement, analysis of student innovation, and analysis of student attitudes toward the course. The total number of students in the first group increased from four to seven, especially in technical work; the creative work-4-8 score integrity factor increased from 5 to 8, and the collaborative outcomes increased from four to seven. The first theme gives only one set of assessments while the other groups are growing. Students' creativity and practical skills gradually increase as the curriculum progresses. First, let us assume that the STEAM Travel Management course has met its goals. Students must gain scientific knowledge by studying STEAM Travel Management and developing creative and practical skills. On this basis, completing all courses will be followed by in-depth studies reflecting the student's knowledge and skills.

### 4.3 Consideration of innovative thinking of tourism management students under the STEAM concept in the Industry 4.0 era

The framework of innovation competency indicators includes three dimensions: innovation awareness, thinking, and skills. The purpose of innovation is to test the student's level of competence and attitude toward the importance of innovation. The aim is to test the flexibility of students' thinking and their unique ability to solve problems to see if they generate new ideas or thoughts and start working creatively with information

technology(Birhan & Merso, 2021). The scale consists of 22 items: items 1 to 2 represent the sense of innovation, items 3 to 15 represent creative thinking, and items 16 to 22 represent creativity. Scores: 3, 2, 1. For students to understand the meaning of the problems, some abstract problems were simplified and visualized without changing the original meaning of the problems(Wibawa et al., 2021).

As shown in Figure 1, the study tested students' creativity before and after the program's implementation. The test variables were creative awareness, creative thinking, and creative skills, and the data were tested before and after the test.

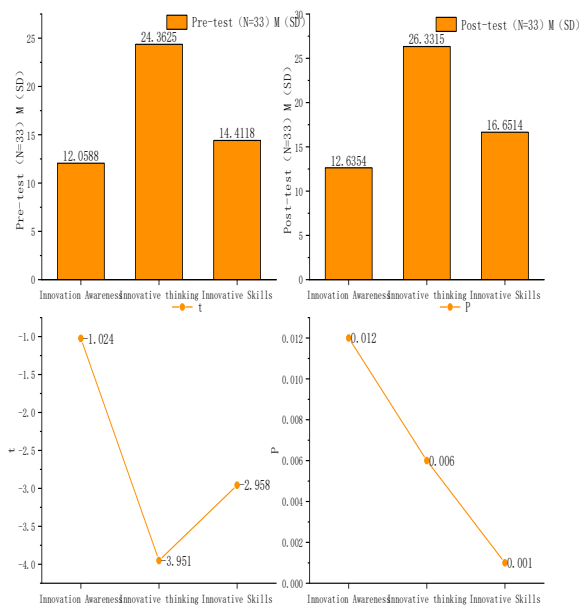


Figure 1 Statistical comparison of pre-and post-tests based on STEAM concept

According to the above data, there were significant differences between students' creative awareness ( $p=0.012<0.05$ ) and creative thinking ( $p=0.006<0.05$ ) before and after the test. Regarding creative skills ( $p=0.001<0.05$ ), the students' creative orientation was consistently higher before and after the class—the values after the 3D test were, on average, higher than those before the test. STEAM travel management courses can improve students' innovation skills by combining importance and mean comparisons.

#### 4.4 Evaluation of innovative thinking of travel management students in the STEAM concept in the era of Industry 4.0

Williams' creativity test consists of four components: risk-taking, curiosity, imagination, and challenge. Risk-takers are fearless of challenges, do not follow the crowd, and dare to present a different point of view. Curiosity is a psychological tendency that occurs in new things or environments and is an indispensable attribute for

creativity; imagination is the ability to create new images based on what already exists in their mind; the problem is that they are afraid of the status quo and love motivation and the opportunity to explore. Take the Williams Creativity Test and complete it in a relationship(Asabere et al., 2021).

As shown in Figure 2, this study used scales to measure students' creativity and then observed trends in students' creativity after two months. Risk, curiosity, imagination, and questions were used as test variables, and the data was tested before and after the study.

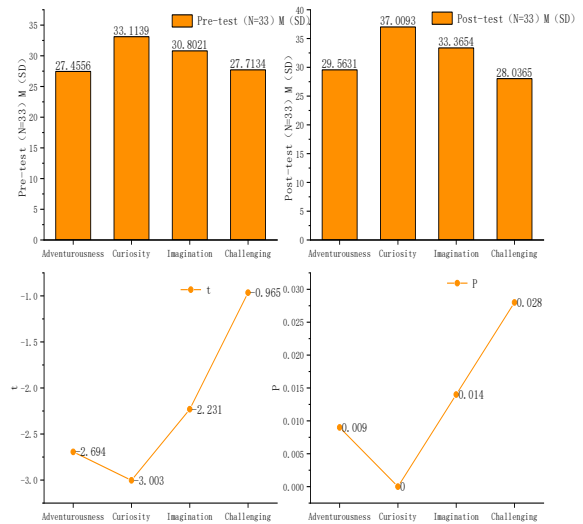


Figure 2 Pre- and post-test statistical comparisons based on STEAM competencies

As mentioned earlier, in the areas of risk-taking ( $p=0.009<0.05$ ), curiosity ( $p=0<0.05$ ) and imagination ( $p=0.014<0.05$ ), most students dared to come up with new ideas or approaches to solve current problems in practical education. Faced with difficulties, students learn solutions and measures together and confidently implement and bombard them(L. Zhang et al., 2023). From the perspective of curiosity, students showed an apparent curiosity and interest in learning because the courses were rich and exciting, close to students' lives, and the learning environment was well designed. By analyzing how things work and applying scenarios, students are very excited to try out the practice. Most students creatively change their work based on assignments and problem-solving. Some of these changes affect the performance of the work, and others affect the appearance of the work so students can use their imagination to the fullest(Lau & Li, 2022). The challenge of the problems was similar ( $p=0.028>0.01$ ), possibly due to the incorrect configuration of the process tasks. However, on average, the post-test values of the 4-D test were higher than the pre-test values. In short, after learning travel management with STEAM, students' propensity to innovate can be significantly enhanced by comparing the importance with the average.

### 4.5 Measurement of attitudes of travel management students in the STEAM concept in the era of Industry 4.0

Attitude is a consistent mental and behavioral disposition towards certain behaviors or objects, including positive or negative cognitive training. Student attitude research aims to understand students' feelings and satisfaction with off-campus activities and improve course content and learning processes based on student feedback. A questionnaire on students' attitudes toward the program was developed based on a review of relevant literature and the use of research findings. A total of 33 questionnaires were distributed, and 28 significant questionnaires were collected.

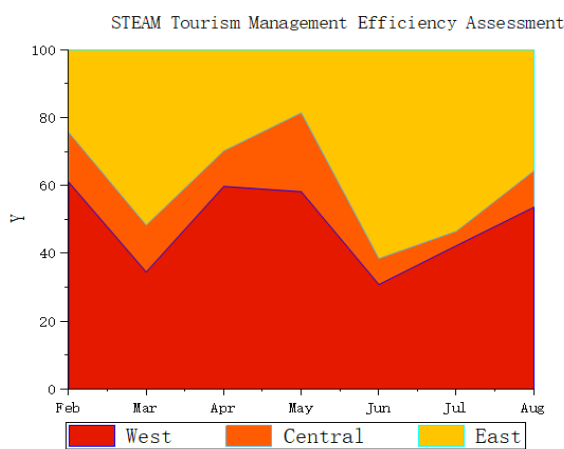


Figure 3 STEAM Tourism Management Efficiency Assessment

As shown in Figure 3, this study conducted an efficiency assessment of tourism management. Why do you like this class? Students could choose from many questions. Nineteen students said they could enrich their knowledge, 25 said the course was lively and exciting with a good classroom atmosphere, and 16 said they were in close contact with real life and had a strong interest in learning. This means that most students can actively participate in the courses. They feel relaxed when learning knowledge, which reflects well on integrating interdisciplinary knowledge. Balanced with the complexity of the course, they also follow the fun and contextual rules of course development. This 21-year-old student says he can create his work at age 16. This student said they had more communication projects with their classmates (Aguichine et al., 2021). This shows that through the course learning, students can increasingly have good conversations with their classmates and feel the joy and consistency of collaboration. It fully reflects a team-centered course design that adheres to curriculum integration and practicality principles.

As shown in Figure 4, this paper surveyed students' satisfaction. Are you satisfied with the training activities of this course? Question 4: Are you satisfied with the content of this course? Question 5: Are you satisfied with the development and preparation of the scientific

publications? Figure 5 shows the results of these three questions. 19-23 students expressed satisfaction with the educational activities, content and work. Students are a central part of the curriculum and significantly impact student motivation and effectiveness. Therefore, the curriculum must begin with students, develop for students, begin with student activities, and develop for student growth. The curriculum incorporates regional characteristics and educational activities designed to reflect students' interests and engage them in learning endeavors that enhance their academic achievement (Fang, 2022). Due to student feedback, most students have a positive attitude toward the course.

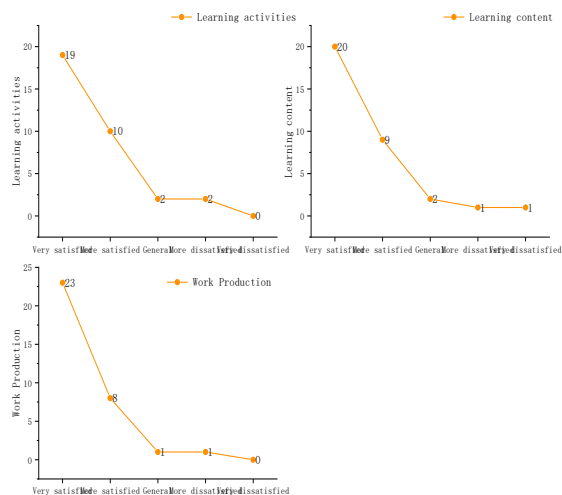


Figure 4 STEAM-based evaluation of tourism management learning activities

What did you learn from this lesson? Students could choose from several questions. Twenty-two students indicated that they learned something they did not know, and 18 indicated that they could design and produce work that they were satisfied with. This indicates that students benefited from knowledge and skills due to their learning. Thirteen students indicated they were the first to find a solution, and 15 indicated their creativity and aesthetics had improved. Both of these categories are relatively small.

On the other hand, it was a question of problem-solving, creativity and aesthetic skills. For example, they needed much exercise to become strong and effective. Second, they become unconscious. Some students do not feel this immediately, so many do not believe it is the most outstanding achievement.



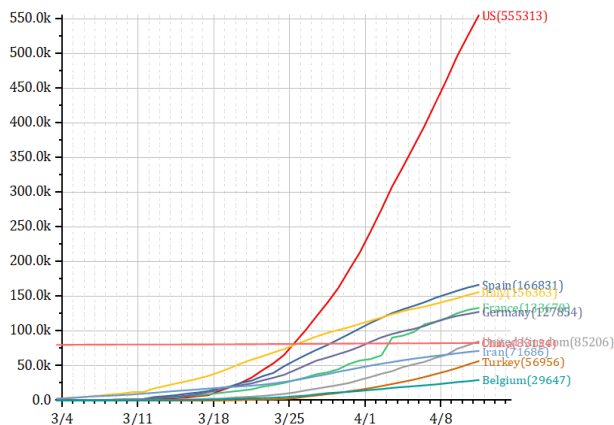


Figure 5 Country-by-country development of tourism management in the era of Industry 4.0

As shown in Figure 5, this study evaluated the country-by-country development of tourism management in the era of Industry 4.0. What changes could teachers make in this course? Students can choose from several questions. The teacher plays a leading role in the classroom and is a leader and mentor for the students. Therefore, good teachers play a crucial role in improving the quality of the course (Agrawal et al., 2022). As shown, 12 students felt they learned faster or slower, seven needed help understanding some information and talking too much, and nine felt the class was too busy and needed more discipline (Bowker, 2021).

## 5. Conclusion

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In this paper, the quality of primary tourism management education was the primary research, and based on the analysis of relevant domestic and international literature, a system was developed to assess the quality of student training in the field of tourism management and based on the information received, quantitative and qualitative assessments of the quality of essential degrees in tourism management were made, and overall management decisions were made. The indicator framework was used to map the students in the field of tourism management in order to understand the current situation and challenges of practical training in tourism management from the student's perspective. The evaluation results of teaching practices were analyzed using a fuzzy integrated evaluation method (Roma, 2021). The results show that students are satisfied with the "average" practice. The lowest level of satisfaction was for the "evaluation of the training process," but this indicator was the highest. Further analysis of the results shows an underinvestment in tourism management. Therefore, future research must continuously improve the empirical studies, adjusting and reviewing the existing estimates. To address this issue, obtaining research data is difficult because the quality of practice teaching in tourism management is assessed using different indicators. Therefore, this paper analyzes only some critical issues and needs to reflect the specifics of individual indicators adequately. Future research should address these issues on a case-by-case basis to improve the quality of tourism management education.

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