

# Changes in the quality demand of tourism talents in China under the impact of COVID-19 and its research enlightenment

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**Abstract:** Systematically grasping the dynamic change of market demand for tourism talents under the impact of novel Coronavirus Pneumonia (COVID-19) is of great significance to the cultivation of cultural and tourism talents in China. In view of the lack of rapid, real-time, comprehensive and accurate insight into the talent market demand in Higher Vocational Tourism Colleges, this paper designs a quality analysis framework system for the job demand of tourism talents, uses web crawler technology to capture recruitment information. Dictionary of tourism talent quality was established under the impact of COVID-19 in 2020 by using text mining technology, cluster analysis and fish bone analysis. It is found that the dictionary of tourism talent quality in China can be divided into two categories: professional quality, knowledge and ability. Due to the impact of COVID-19, the industry's demand for innovative talents, information technology application capabilities, marketing capabilities, financial knowledge and application abilities is particularly urgent. Based on this, this paper puts forward the path to improve the quality of tourism talents training under the impact of COVID-19 from the aspects of paying attention to the cultivation of compound innovative talents, strengthening the injection of ideological and political education elements, adapting to the adjustment of national macro strategy, increasing the integration of information technology application, and responding to the continuous adjustment of tourism industry. The research results can provide reference for the reform of professional talents training in tourism industry and higher vocational tourism colleges.

## 1. Introduction

Culture and tourism play an extremely important role in the national strategic layout. The high-quality integrated development of culture and tourism ultimately depends on talent, and talent training is the key driving force and fundamental guarantee [1]. However, at present, there is a structural contradiction between supply and demand of social talents in China's cultural and tourism industry. One of the main reasons for this dilemma is that colleges and universities lack the ability to quickly insight into the changes of talent market demand, and the trained cultural and tourism professionals are divorced from social needs. In particular, the outbreak of COVID-19 in 2020 had a serious impact on the tourism industry [2], and its demand for talent market will inevitably change. Therefore, it is of great significance to actively grasp the dynamic changes of talent market demand in the cultural and tourism industry, and then carry out the adaptive adjustment of talent training mode.

Research on the construction and reform of various majors under the background of big data is emerging one after another, but most of them lack strong data support and are still based on a theoretical perspective. For example, Gui [3] discussed the cultivation of financial management talents in universities under the background of big data from the reform of curriculum system, teaching mode

and teaching evaluation. Dong [4] explored the reform path of talent training mode for software technology majors in Higher Vocational Colleges under the big data environment from the aspects of the construction of students' vocational learning roadmap, the curriculum system of vocational post ability training, three-dimensional teaching resource platform construction, personalized learning task push, employer platform construction. Gan et al. [5] put forward an all-round reform mode of using big data to serve teaching in combination with the characteristics of the big data era.

Questionnaire survey, interview and other manual methods are common ways to understand the job classification and skill needs of the trained students under the traditional background. For example, Sharyn et al. [6] collected the Australian recruitment market data manually and analyzed the enterprises' requirements on the ability of students majoring in information management by using content analysis method. Kim et al. [7] investigated the knowledge and ability needs of e-Science professionals by interview method, and found that the professionals should be familiar with database management tools, team cooperation and communication skills. Yang [8] conducted a questionnaire survey on hotel management students, graduates, teachers and hotels, and analyzed the innovative training system of talents' explicit ability in higher vocational education.

Big data mining based on massive recruitment information has become an effective method to understand the talent positions and skill needs of enterprises. Especially with the maturity of Web-based text mining technology, more and more domestic and foreign scholars apply it to the education industry. For example, Smith and Ali [9] collected the recruitment information of program developers from the recruitment website, and uses keyword indexing technology to analyze the demand trend of several programming languages in recent years, so as to provide reference for the curriculum setting of computer majors. Zhan [10] used the 66925 recruitment information collected in the e-commerce industry to analyze the needs of each post of e-commerce and the overall needs of skills. Through Chinese word segmentation and text clustering of recruitment information on Zhaopin.com, Tang et al. [11] found that there were differences between the career types and professional fields of the required talents.

It can be found that in the era of big data, the construction and reform of various majors are facing new challenges [3-5]. It is imperative for tourism majors to adapt to the demand for talents in the tourism market, and to adjust and meet the reform and innovation of talent training mode at the present stage. The research on job classification and skill needs of employers provides a reference for this reform. The research on the job classification and skill needs of employers mostly relies on manual methods such as questionnaire survey and interview [6-8]. However, this method has a series of problems such as limited sample size and labor-intensive. Big data mining technologies such as web text analysis based on job recruitment information provide the best way to solve this problem. Big data mining technology has achieved fruitful results in the research of recruitment information in the education industry [9-11]. However, on the whole, some of these studies have simple methods in the construction of professional dictionaries, or the amount of data is small, or the source of dictionary information is relatively single, and its later data analysis will be obviously affected. At present, there is no relevant application research of big data mining technology in tourism professional post classification and skill demand, so the relevant research will play a positive role in promoting the reform and innovation of tourism professional talent training mode.

## **2. Quality analysis framework of post demand for tourism talents**

In order to scientifically analyze the talent quality required by the post group of tourism enterprises, a quality analysis framework system for the post demand of tourism talents is designed, as shown in Figure 1. The framework system mainly includes four modules: data acquisition, data processing, data analysis and result presentation.

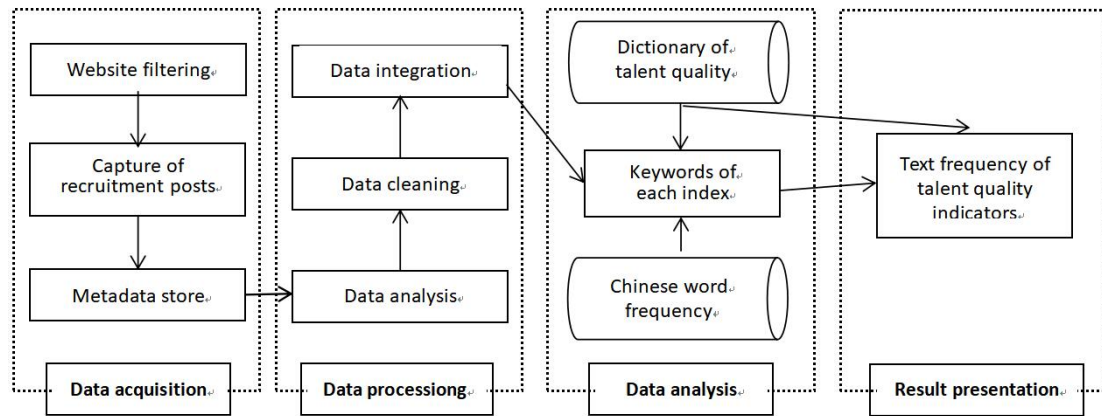


Figure 1. Quality analysis framework of post demand for tourism talents

## 2.1 Data acquisition module

In order to ensure the accuracy and authority of the data, through the four mainstream recruitment platforms of "51job, Zhilian recruitment, 58 tongcheng and zuijiadongfang", the main posts of tourism enterprises were used as keywords by using web crawler technology to determine the data capture range, collected the recruitment information released by tourism enterprises from January to December 2020, formed metadata and stored it.

## 2.2 Data processing module

The core of the module is text mining. Firstly, the captured data content was cleaned and standardized, and then the Chinese word segmentation technology was used to screen the keywords with analytical value. Finally, the processed keywords were integrated as the objects for formal analysis.

## 2.3 Data analysis module

The selected keywords were used to construct the tourism talent quality dictionary by using the word frequency analysis, cluster analysis and fish bone analysis of medium and high frequency keywords, so as to provide the basis for the quality analysis of tourism talents.

## 2.4 Result presentation module

The result presentation stage is the process of applying mining results to solve practical problems. The main function of this module is to display text data and publish analysis conclusions. This study will process the data obtained by the module, according to the categories of the tourism talent quality dictionary, and analyze the requirements of the main posts of tourism enterprises for talent quality through the method of frequency statistics.

## 3. Analysis on the quality and post demand of tourism talents

### 3.1 Main job coverage of tourism enterprises

In order to facilitate data collection, this paper sorts out the main jobs of tourism enterprises through network research and enterprise research. Under the impact of COVID-19, tourism enterprises mainly include seven types of enterprises, including hotels, travel agencies, scenic spots, exhibitions, cruises, homestay inn and research companies (Fig.2). The main posts of hotels involve room service, catering, kitchen, engineering, etc. The main posts of travel agencies involve marketing, operation, planning and tour guide, etc. The main posts of scenic spot involve marketing, reception, operation and maintenance, entertainment performance, etc. The main posts of exhibition involve exhibition planning and exhibition services. The main posts of cruise ship involve sea riding. The main posts of homestay inn include operation management and housekeeper. Research companies mainly involve

research planners and research mentors. It can be found that there are commonalities in the post requirements of marketing, planning and operation in tourism enterprises.

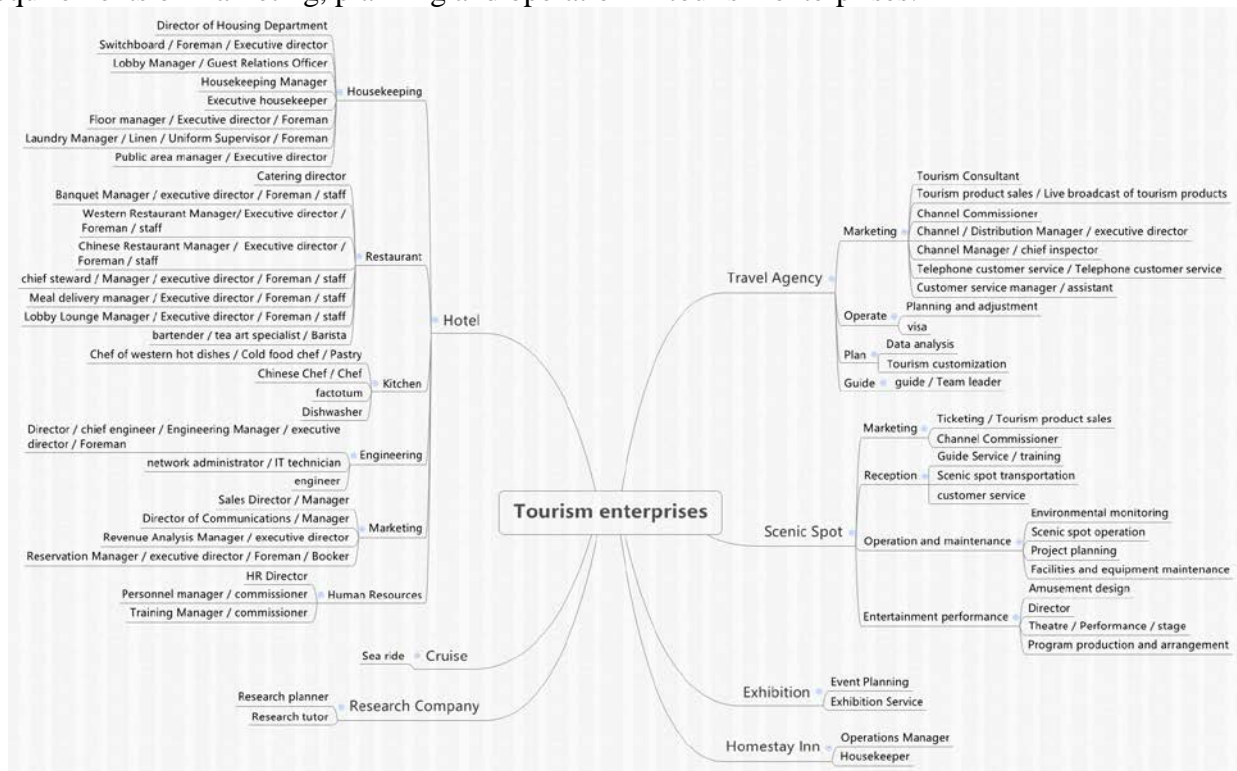


Figure 2. Main job coverage of tourism enterprises

### 3.2 Construction of quality dictionary of tourism talents

#### 3.2.1 Word frequency analysis of high frequency keywords in recruitment information

In the data processing module, 296 keywords were integrated and selected by using Chinese word segmentation technology for the captured recruitment information. Due to the huge amount of captured recruitment information, the data in this part is based on the average data volume of one week. In order to fully describe the requirements of enterprises for the quality of tourism talents, this study uses the method of "word frequency, word quantity and cumulative word frequency proportion" to determine the high-frequency keywords. After experimental adjustment, the keywords with frequency  $\geq 680$  were selected as high-frequency keywords, and the total frequency accounted for 82% of the total frequency of all keywords. Finally, 60 high-frequency keywords were determined (Table.1). The top 10 high-frequency keywords are "conscientiousness, communication skills, skills, service awareness, customer relations, online, sales, etiquette, office software, cooperation". Compared with the top 10 medium-high frequency keywords before COVID-19 outbreak, it is found that more emphasis is placed on "online".

Table.1. Frequency ranking of high frequency keywords

Code	Keywords	Code	Keywords	Code	Keywords	Code	Keywords
1	serious and responsible	16	language expression	31	management ability	46	live broadcast
2	communication skills	17	certificate	32	open up	47	data
3	skill	18	English	33	love work	48	plan
4	service consciousness	19	executive power	34	honesty and trustworthiness	49	extension
5	customer relationship	20	steadfastly	35	mental health	50	judge

6	online	21	negotiation	36	organization skills	51	customized
7	sale	22	work enthusiasm	37	innovate	52	professionalism
8	ceremony	23	good health	38	observation	53	good image
9	office software	24	writing	39	offer	54	good temperament
10	cooperation	25	study	40	open personality	55	positive
11	affinity	26	team	41	summary	56	promotion
12	interpersonal communication	27	cooperation	42	understand	57	Japanese
13	respect	28	Strain capacity	43	comprehend	58	be quick-witted
14	compressive capacity	29	operate	44	originality	59	dare to challenge
15	professional knowledge	30	consulting service	45	design	60	settlement

### 3.2.2 Cluster analysis of high-frequency keywords in recruitment information

In order to clarify the classification relationship between high-frequency keywords, the co-occurrence matrix of 60\*60 was established by co-word analysis of 60 high-frequency keywords. Then the co-occurrence matrix was imported into SPSS software for k-means clustering analysis after standardization. Cluster analysis is a process of mathematical operation analysis of the distance between words in the co-word relationship network, gathering the keywords close to each other to form a class with relatively independent concepts, so as to minimize the attribute similarity between classes and maximize the attribute similarity within classes. Finally, the clustering results of medium and high frequency keywords were obtained, as shown in Table 2, which were divided into 14 categories.

Table.2. Clustering results of medium and high frequency keywords

Code	Keywords
1	1. Serious and responsible 20. Steadfast and willing to work 22. Work enthusiasm 33. Love work 34. Honesty and trustworthiness 52. Professionalism
2	23. Good health 53. Good image 54. Good temperament
3	40. Open personality 14. Compressive capacity 35. Mental health 55. Positive 59. Dare to challenge
4	4. Service consciousness 11. Affinity 13. Respect
5	2. Communication skills 12. Interpersonal communication 16. Language expression
6	37. Innovate 44. Originality 45. Design 51. Customized
7	3. Skill 8. Ceremony 17. Certificate 15. Professional knowledge 21. Negotiation 24. Writing 30. Consulting service
8	19. Executive power 28. Strain capacity 31. Management ability 36. Organization skills
9	18. English 57. Japanese
10	25. Study 38. Observation 39. Attention 41. Summary 42. Understand 43. Comprehend 50. Judge 58. Be quick-witted
11	10. Cooperation 26. Team 27. Cooperation
12	6. Online 9. Office software 46. Live broadcast 47. Data
13	5. Customer relationship 7. Sale 29. Operate 48. Plan 49. Extension 32. Open up 56. Promotion
14	39. Offer 60. Settlement

### 3.2.3 Construction of tourism talent quality dictionary

According to expert interviews and combined with the actual situation of enterprise research, 14 types of medium and high frequency keywords were summarized as: professional ethics and responsibility, physical quality, psychological quality, service awareness, interpersonal communication and communication ability, innovation ability, professional knowledge and ability, management and organization ability, foreign language application ability, lifelong learning ability, team cooperation ability, information technology application ability Marketing ability, financial knowledge and application ability to form a three-level index system of tourism talent quality dictionary. Each three-level index system has high-frequency keywords obtained by cluster analysis, such as professional ethics and sense of responsibility, including serious and responsible, down-to-earth and willing to work, enthusiasm for work, love for work, honesty and trustworthiness and professionalism. For details, please refer to the keyword fishbone analysis chart in the tourism talent quality dictionary (Fig. 3). At the same time, the 14 three-level indicator systems were summarized into two secondary indicators: professional quality and knowledge and ability, and finally a tourism talent quality dictionary is constructed, as shown in Table 3.

Table.3. Dictionary of tourism talent quality

Primary index	Secondary index	Tertiary indicators	Keywords
Tourism talent quality	Professional quality	A. Professional ethics and sense of responsibility	A1: Serious and responsible A2:Steadfast and willing to work A3:Work enthusiasm A4:Love work A5:Honesty and trustworthiness A6:Professionalism
		B. Physical quality	B1:Good health B2:Good image B3: Good temperament
		C. Psychological quality	C1:Open personality C2:Compressive capacity C3:Mental health C4: positive C5: Dare to challenge
		D. Service consciousness	D1: Service consciousness D2: affinity D3: respect
		E. Interpersonal communication skills	E1: communication skills E2: Interpersonal communication E3: Language expression E4: negotiation
		F. Lifelong learning ability	G1: study G2: observation G3: attention G4: summary G5: understand G6: comprehend G7: judge G8: be quick-witted
		G. Teamwork ability	H1: cooperation H2: team H3: cooperation
	Knowledge and ability	H. Innovation ability	F1: innovate F2: originality F3: design F4: customized
		I. Professional knowledge and skills	I1: skill I2: ceremony I3: certificate I4: professional knowledge I5: writing I6: consulting service
		J. Financial knowledge and application ability	J1: offer J2: settlement
		K. Foreign language application ability	K1:English K2:Japanese

	L. Information technology application capability	L1:online L2:Office Software L3: live broadcast L4:data
	M. Marketing ability	M1: Customer relationship M2:sale M3:operate M4:plan M5: extension M6: open up M7:promotion M8:data
	N. Management organization ability	N1: Executive power N2: Strain capacity N3: Management ability N4: organization skills

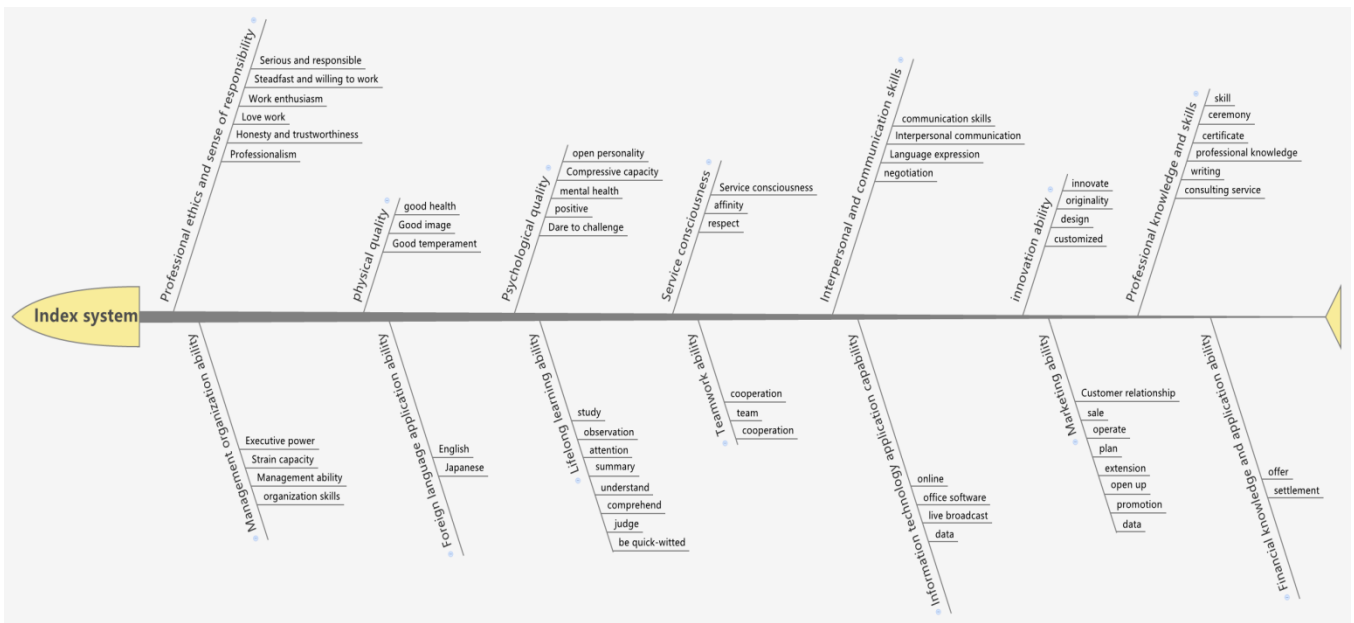


Figure 3. Key words fishbone analysis diagram of tourism talent quality dictionary

#### 4. Changes in the quality demand of tourism talents in China under the impact of COVID-19 and its research enlightenment

##### 4.1 Changes in the quality demand of tourism talents in China under the impact of COVID-19

Compared with the research on the post quality demand of tourism talents in China before the outbreak of COVID-19, the following changes are found:

(1) The identified high-frequency keywords are slightly different. "Online, live, quotation, settlement, customization, writing and negotiation" have become the newly added high frequency keywords in the period of COVID-19. It should be pointed out that in 2020, the two keywords "online and live" appeared frequently. The main reason is that affected by the epidemic, the tourism demand of inbound and outbound and domestic tourists is limited, and many offline tourism enterprises began to gradually explore online business means. For example, many travel agencies and scenic spots have opened up E-shops, online live broadcasting rooms, virtual tourism and other network means for tourism marketing. Therefore, employees are required to have high information application knowledge and ability. In addition, with the normalization of epidemic prevention and control and the consideration of travel distance, transportation mode and health and safety, tourists prefer high-end tourism, family tourism, small package tourism and couple tourism, and accelerate the advent of the "small group era" of domestic tourism. The "2020 national day new group follow revival report" released by Ctrip.com shows that small-scale, private and free "private groups" have become the "new normal" of group tourism. Therefore, travel agencies put forward the ability to customize routes for tourism talents during recruitment (Fig. 2, Table 3).

(2) The application ability of information technology should be paid more attention. Tourism enterprises require employees not only to be able to operate office software, but also to master the application of various we-media platforms, as well as the basic ability to capture and analyze market data with software under the development environment of big data (Fig. 2, Table 3).

(3) financial knowledge and application ability has been added. After cleaning and standardizing the captured recruitment information by using crawler technology, according to the emergence of two high-frequency keywords "quotation" and "settlement" and the results of cluster analysis, a three-level index financial knowledge and application ability (Table 3) is added. As employees of tourism enterprises, they need to have basic financial ability.

In conclusion, under the impact of COVID-19, the quality of tourism talents has undergone new changes in terms of professionalism, knowledge and ability (Fig. 3, table 3). In terms of knowledge and ability, most job groups have improved their requirements for marketing ability and information technology application ability, which is consistent with the rise of online marketing. In terms of professional quality, most post group enterprises attach most importance to physical quality, which is consistent with the social atmosphere in which the whole people pay attention to health under the epidemic prevention and control in 2020. In addition to physical quality, the requirements for quality mainly focus on teamwork ability, interpersonal and communication ability and lifelong learning ability, which is also consistent with the development trend of personalization, customization and reservation in the tourism industry. At the same time, the normalization of epidemic prevention and control also requires paying attention to strengthening the public health emergency rescue skills training of tourism practitioners and improving the emergency rescue ability of tourism practitioners.

## **4.2 Research enlightenment**

### **4.2.1 Pay attention to the cultivation of compound innovative talents**

Tourism enterprises are very fond of the professional quality, knowledge and ability of tourism talents, and also put forward specific requirements. Therefore, tourism colleges should pay more attention to the cultivation of compound, innovative and skilled talents in terms of talent training objectives. They should adhere to the integration of production and education, the integration of knowledge and practice, the integration of theory and practice, and the combination of work and learning, and deepen the reform of the training mode of compound and innovative talents, which has also become the only way to improve the training quality of tourism colleges. In view of the transformation and development of the tourism industry and the regional economic and social needs, the talent training mode can be innovated. For example, a new curriculum system and new professional standards can be constructed to promote the connection between the curriculum content and the new tourism technology and development, and the connection between the teaching process and the production and operation process of tourism enterprises. Based on the coupling mechanism of entrepreneurship education and professional education [12], taking the coupling of curriculum elements as the core, build a new curriculum system for the integration of entrepreneurship education and professional education facing the curriculum promotion mode. Finally, we will cultivate compound, innovative and skilled tourism talents to meet the needs of the times and the industry.

### **4.2.2 Strengthen the injection of ideological and political education elements**

The professional quality in the dictionary of tourism talent quality includes professional ethics and sense of responsibility, physical quality, psychological quality, service consciousness, interpersonal communication and communication ability, lifelong learning ability and team cooperation ability. These professional quality requirements coincide with the infiltrative cultivation of ideological and political education in the courses of socialist core values, healthy China strategy, moral, intellectual, physical, artistic and labor "Five Education", three complete education, craftsman spirit and so on [13]. Therefore, higher vocational tourism colleges and majors should pay attention to the construction of curriculum ideological and political teaching team, the reconstruction of curriculum ideological and political curriculum system, the optimization of curriculum ideological and political teaching methods,



the deepening of curriculum ideological and political teaching practice, the expansion of time and space dimensions of curriculum ideological and political construction, and the reflection on the effect of curriculum ideological and political teaching. Finally, the two wheel drive of "knowledge transmission" and "ideological and political education" will be formed to realize the organic unity of knowledge transmission, value shaping and ability training, so that ideological and political elements can be infiltrated with professional knowledge teaching in the same frequency, and students can become spiritual adults from professional talents [14].

#### **4.2.3 Adapt to the adjustment of national macro strategy**

At present, research travel activities have been included in the teaching plan of primary and secondary schools in China. Research travel has been rapidly promoted throughout the country, becoming a hot topic in the current education reform and the integration of culture and tourism [15]. It is a new development model of the integration of education, culture and tourism. Although affected by the epidemic, the demand of tourism enterprises for research talents (Fig. 1) still reflects the response of the industry to the national demand. Higher vocational tourism colleges and majors should also make active adjustments in the professional curriculum system and teaching methods during the training of tourism education talents. In addition, tourism vocational colleges should actively cooperate with tourism training and evaluation organizations, and actively explore the pilot work of "1+X" certificate system in the field of tourism vocational skills [16-17] such as the certificate of travel agency planning and coordination, the certificate of tourism marketing staff, the certificate of scenic spot interpreter, the certificate of resident dormitory administrator, and the certificate of hotel related vocational skills. So as to deepen the reform of the training mode and evaluation mode of compound tourism technical skills talents, explore the construction of "credit bank" of tourism vocational education, and improve the training quality of tourism vocational education talents [17].

#### **4.2.4 Increase the integration of information technology applications**

The rapid development of "Internet Plus" and artificial intelligence has innovated tourism development formats. The application of intelligent tourism, digital museum, virtual tourism, tourism big data mining and tourism digital marketing has brought opportunities to the development of tourism. Speech translation, AR/VR digital tour guide, robot customer service, intelligent travel planning, concierge robots and other applications in the tourism industry accelerate the transformation and upgrading of the tourism industry. The integration of "Internet Plus", artificial intelligence and tourism culture industry and higher vocational education industry will enhance the ability of cultural transmission, dissemination and innovation, and continuously meet the demand of industry for the application of information technology in tourism talents. Higher vocational tourism colleges should take advantage of the opportunity of the application of cutting-edge science and technology in the field of education to carry out all-round and in-depth educational reform, build a diversified information-based education model of "tourism culture plus education plus science and technology" [18], build an intelligent learning platform, and optimize the training path of higher vocational tourism Talents driven by social needs and linked by data.

#### **4.2.5 Coping with the continuous adjustment of tourism formats**

Under the background of cultural tourism integration, new forms of tourism emerge one after another. However, at present, the spillover effect of talent education in Tourism College is obvious, and talent training often lags behind the development of the industry [19]. With the support of the national research travel policy, the travel agency specialty needs to transform to the training of research tutors. With the continuous development of new media such as live broadcast, tourism e-commerce specialty should be able to cultivate professional talents in live broadcast, sales and marketing. With the proposal of the concept of "fast travel and slow travel" in tourism, the specialty of scenic spot service and management should increase the training of tourism interpretation talents. Therefore, higher vocational tourism colleges should adapt to the needs of industry development, try to explore the construction of "head enterprise plus ecology" industrial colleges and micro majors such as "red

research", "digital marketing", "cultural and creative planning" and "micro deduction", so as to improve the coverage of students' knowledge and skills. Encourage students to take multi-disciplinary elective courses, and let students choose micro professional courses according to their interests and specialties, so as to realize the development of "one specialty and multiple abilities" [20]. Then build a knowledge chain from professional knowledge production to industrial knowledge application, so that the students are well adapted to the social demand for tourism talent.

## 5. Conclusions

Based on the unstructured recruitment big data on the recruitment website, this study established a large sample, fast, accurate and intelligent talent market demand analysis model, changed the traditional talent market demand research method, and enabled higher vocational tourism colleges to rapid, real-time, comprehensive and accurate insight into COVID-19 outbreak impact of tourism talent market positions and quality requirements change. The study found COVID-19 outbreak impact on the tourism market demand tends to occupation ethics and responsibility, physical quality, psychological quality, service awareness, interpersonal and communication skills, professional knowledge and ability, management and organizational ability, foreign language application ability, lifelong learning ability, teamwork ability, innovation ability, information technology application ability, marketing ability, financial knowledge and application ability. Higher vocational tourism colleges should actively respond to the impact of COVID-19, and make dynamic adjustments in the process of talent training based on the construction of the dictionary of tourism talent quality, especially to strengthen the cultivation of tourism talent innovation ability, information technology application ability, marketing ability, financial knowledge and application ability.

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