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Research on the Influence of College Students' Innovation and Entrepreneurship Education on the Shaping of Cultural Confidence Based on Deep Learning Models

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Abstract Innovation and entrepreneurship education is an important carrier for cultivating college students' cultural confidence. This paper constructs an innovation and entrepreneurship smart classroom based on artificial intelligence technology to improve the efficiency of students' online and offline learning. The knowledge graph is designed from both the schema layer and the data layer to integrate innovation and entrepreneurship education resources. In the knowledge representation module, the knowledge graph embedding (TransE model) and the deep wandering algorithm (DeepWalk) are integrated to realize the accurate recommendation of knowledge. Using the innovative entrepreneurship resource base system based on the knowledge graph and knowledge representation module for assisted learning, students' cultural self-confidence can be shaped from eight dimensions, including “historical and cultural identity”, etc. The correlation between the eight influencing factors and cultural self-confidence is more than 0.5, P<0.001, and can explain 80.5% of the variance of cultural self-confidence. Beta values are all greater than 1.600, and three factors such as “linguistic and cultural identity” have a significant impact on shaping cultural self-confidence (P<0.0001).

Index Terms innovation and entrepreneurship education, knowledge mapping, TransE model, DeepWalk, cultural self-confidence shaping

I. Introduction

With the arrival of economic globalization and the information age, innovation and entrepreneurship education has become an important driving force for the development of contemporary society and an important topic of contemporary education reform [1]. At present, colleges and universities, as the dissemination center of knowledge, technology and culture, shoulder the important mission of cultivating innovative and entrepreneurial talents [2]. Higher education should not only cultivate high-quality talents with knowledge and skills, but also cultivate inheritors who have the spirit of patriotism and can carry forward the excellent traditional Chinese culture [3], [4]. Therefore, when practicing the path and exploration of innovation and entrepreneurship education, higher education institutions try to integrate cultural self-confidence education, which is important for cultivating a high degree of cultural self-consciousness and cultural self-confidence of college students, telling the Chinese story to the world and providing Chinese wisdom [5]-[7].

Cultural self-confidence is a concrete embodiment of national cultural soft power, and innovation and entrepreneurship of college students is a strategic choice for national innovation-driven development [8]. Cultural self-confidence is not only the affirmation of the cultural value and development path of the country, but also the core power to stimulate the vigor of innovation and entrepreneurship of contemporary college students [9], [10]. Chinese excellent traditional culture has deep historical deposits and unique values, which provides core value leadership for innovation and entrepreneurship education in colleges and universities [11], [12]. Exploring the effective path of innovation and entrepreneurship education in colleges and universities under the perspective of cultural self-confidence is not only related to the reform and development of education, but also to the inheritance and innovation of a country's culture, which is of inestimable strategic significance for enhancing the competitiveness of the country [13]-[15].

This paper takes artificial intelligence technology as the core, and establishes a multi-party interactive innovation and entrepreneurship smart classroom by integrating knowledge graph construction and deep learning algorithms. The knowledge graph is constructed and its semantic network and recommendation model are connected through the knowledge representation module to realize the precise adaptation of resources and shape students' cultural confidence. Utilize the TransE model to represent the heterogeneous knowledge graph in entity vectorization, combined with the DeepWalk algorithm to mine the learning path features to form an accurate innovation and

entrepreneurship knowledge recommendation framework. Design a hybrid teaching mode, integrating online resource retrieval and offline practice, and develop an intelligent teaching system with the help of SSH2 architecture to support students' personalized learning and dynamic evaluation.

II. Establishment of an innovative and entrepreneurial smart classroom for university students based on deep learning

II. A. Building an innovative and entrepreneurial smart classroom with artificial intelligence technology

Through the use of artificial intelligence technology, strengthen the integration and dissemination of Internet resources, build a smart classroom for innovation and entrepreneurship in colleges and universities, realize the effective integration of the Internet and education in the era of education informatization 2.0, and optimize and enrich the teaching content by using artificial intelligence technology. Jointly utilizing various teaching means such as projection, multimedia courseware, chalk, blackboard, etc., and through the information technology platform, it constructs a variety of presentation methods for the course teaching content, including sound, animation, text, drawings, etc., thus constructing a graphic and vivid and realistic teaching classroom. Construct interactive learning methods for students, including question and answer, classroom sign-in, classroom sign-out, etc. Combine with the current characteristics of industry development, constantly adjust and enrich the teaching methods, and utilize a number of elements of the times to enhance the interest of classroom teaching. Utilizing the smart classroom, we build the whole link, whole process and all-round management mechanism for students, thus continuously deepening the theory of innovation and entrepreneurship education, continuously deepening the classroom organization and management, and perfecting the teaching content and evaluation of results.

In addition to theoretical teaching, constantly enrich the operation and practice part of the course teaching, and strengthen the targeted training for professional course teaching. Continuously enrich students' valuable practical experience, combine theoretical teaching with practical teaching, continuously innovate innovative entrepreneurship classroom mode, deepen the teaching structure of the course, and effectively meet the current development trend of artificial intelligence. Based on the principle of teaching students according to their aptitude, constantly deepening personalized education, through the construction of the intelligent classroom, better grasp the learning needs of learning and professional knowledge mastery, based on the terminal application APP data analysis function, timely adjustment and optimization of teaching work. Enhance the high efficiency and accuracy of the teaching of innovation and entrepreneurship courses in colleges and universities, and better achieve the goal of personalized education. In the construction of the dual innovation wisdom classroom, the teaching goal is to realize the comprehensive and intelligent development of students, cultivate their core literacy, and improve their self-confidence in the development of national culture.

It builds mixed teaching methods before and after class, online learning and physical classroom teaching methods, centers on all students, practices constructivist learning theory, and builds project learning and problem solving learning methods for students. Construct activity process, classroom form, organization form, etc. for students, learn first and then teach, determine teaching by learning, sort out the teaching activities of innovation and entrepreneurship courses, and promote accurate teaching through data-based decision-making. It realizes personalized tutoring and collaborative homework for students, introduces artificial intelligence technology, and after the completion of the teaching activities of innovation and entrepreneurship courses, it realizes the comprehensive evaluation of students' dynamic and whole-process teaching activities, and analyzes its impact on shaping students' cultural self-confidence.

II. B. Construction of Knowledge Maps in the Field of Innovation and Entrepreneurship

The knowledge graph of innovation and entrepreneurship education is logically divided into two levels: the model layer and the data layer. The schema layer is the core of the knowledge graph, which is the refined knowledge that is used to constrain the data layer. In the data layer, knowledge is stored in the graph database in the unit of facts, and the triplet of "entity-relation-entity" or "entity-attribute-property" is used as the basic expression of facts, forming a huge network of entity relationships and forming a "graph" of knowledge. The traditional knowledge graph construction generally adopts a combination of "top-down" and "bottom-up" methods, and the schema layer is designed and classified according to the data characteristics of specific domains, and the framework of entity concepts, entity attributes and relationships between entities is constructed. Under the constraints of the schema layer, the data layer selects appropriate methods for data preprocessing, extraction of entities, attributes and relationships, knowledge fusion, and knowledge storage and update. Figure 1 shows the process of building a knowledge graph for innovation and entrepreneurship education.

The construction mode of domain-specific knowledge graph can be applied to the visual display of data, semantic search, intelligent Q&A and assisted decision-making. For the field of innovation and entrepreneurship education,

the existing knowledge graph can be used to form a knowledge network composed of node-to-node relationships based on the integration of various teaching resources, which can realize personalized education for individual students according to the characteristics of different innovation and entrepreneurship projects and teaching laws.

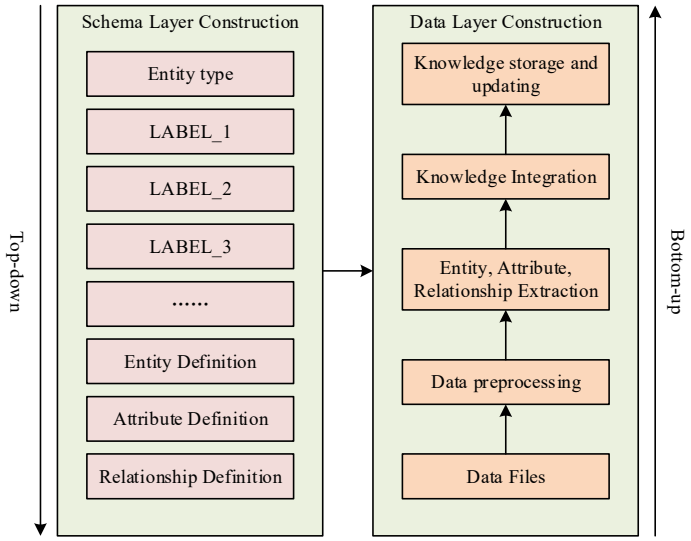

Figure 1: Process of knowledge graph construction

II. C.Knowledge representation module

The knowledge representation module plays the role of connecting the innovative entrepreneurship knowledge graph with the deep reinforcement model. The innovation and entrepreneurship knowledge graph belongs to the high-order semantic network, which contains entities, relationships and other information of high dimensionality that cannot be directly utilized by various recommendation models. Therefore, it is necessary to vectorize the entities and relations in the graph, and the knowledge representation learning module can project the entities and relations and performance in the graph, so that its complex semantics are presented in the form of vectors in the low-dimensional space. Aiming at the characteristics of innovation and entrepreneurship knowledge graph, several common embedding models TransE, TransH and TransR are experimentally compared, and TransE model is finally chosen to learn the learner and learning resources and relationship information in innovation and entrepreneurship graph. Meanwhile, in order to effectively utilize the learner learning path information, this model utilizes DeepWalk to learn the low-dimensional vector representation of the path information between nodes as auxiliary information to improve the accuracy of recommendation.

II. C. 1) Knowledge representation based on knowledge graph embedding

The structure of innovation and entrepreneurship knowledge graph belongs to heterogeneous knowledge graph, in order to meet the input requirements of the recommendation task for learners, resource items and interaction relations, this paper selects the method based on knowledge graph embedding to represent the learning of head and tail entities and relations.

For the ternary (h,r,t), the TransE model projects the head vector and the relation vector into the same vector space through a mapping operation, and considers the relation vector as a translation between the head and tail entities. The core idea is as follows:

$$V_h + V_r \approx V_t \tag{1}$$

where V_h denotes the head entity vector, V_t denotes the tail entity vector, and V_r denotes the relationship entity vector. And set the score function of TransE learning model as:

$$f_r(h,t) = \left| V_h + V_r - V_t \right|_{L1/L2} \tag{2}$$

The model models the loss function through the negative sampling method, and the specific formula is shown in equation (3). Where $[\cdot]$ indicates that when the value of · is greater than 0 take the value of · as the result of the

calculation, otherwise the equation takes the value of 0; margin is the boundary parameter, usually take a positive value; positive sample set for S, negative sample set for S'.

$$Loss = \sum_{S}\sum_{S'}\left[m\arg in + f_r(h,t) - f_{r'}\left(h',t'\right)\right] \tag{3}$$

There are many kinds of knowledge graph embedded learning methods, choose the best knowledge representation of the TransE model, relative to several other models TransE involves fewer parameters, can be effectively used for larger data sparse scenarios, help to solve the later recommended process of knowledge sparse problem, after the TransE model learning can be obtained after the entity and the relationship between the vector representation.

II. C. 2) Knowledge representation based on deep wandering

TransE model can realize the vectorized representation of learners and resource items in the knowledge graph of innovation and entrepreneurship, ERKD model needs to mine the learners' learning paths, so this paper introduces DeepWalk model on the basis of TransE to learn the path information of the resource items.DeepWalk is a learning algorithm based on the randomized wandering of the knowledge representation, which aims to represent the nodes in the knowledge graph as low-dimensional vectors which can be used for subsequent recommendation tasks. DeepWalk used in this model consists of two main parts: random walk and Skip-Gram model.

Random wandering is a method of randomly selecting paths in a graph with the aim of generating local neighborhood information of nodes in the graph. For a collection of educational resources I and a collection of learners U in an innovation and entrepreneurship knowledge graph. Random wandering starts at node i_0, randomly selects neighboring nodes along the edges of the graph, and moves to the next node with a certain probability. This process is repeated for a number of steps until a predetermined tour length T is reached. This model takes the resource i_0 node where the learner first starts learning as the initial node, and repeats the stochastic process to generate a large number of node sequences for capturing local structural information in the knowledge graph.

The Skip-Gram model is responsible for learning the vector representation of the nodes and maximizing the conditional probability of predicting the arrival of a given node to a neighboring node, computed as:

$$L = \sum(\log \Pr(N(i) \mid V_i)) \tag{4}$$

where i is a node in the resource sequence, $N(i)$ denotes the set of neighbor nodes of node i, and V_i denotes the vector representation of node i. The conditional probability $P_r(N(i) \mid V_i)$ can be calculated by softmax function:

$$P_r(N(i) \mid V_i) = \exp(V_i * V_m) / \sum(\exp(V_i * V_n)) \tag{5}$$

where m is a neighbor node of node i, n is any node in the knowledge graph, and V_m and V_n denote the vector representations of node m and node n, respectively. The vector representation of each node is learned by maximizing the objective function L.

III. Pathways to shaping cultural confidence in innovative and entrepreneurial smart classrooms

III. A. Overall system architecture

III. A. 1) Expression layer

Based on the knowledge graph and knowledge representation module of the university students' innovation and entrepreneurship resource base system adopts the SSH2 architecture which is widely used at present, the database adopts MySQL, and the web server adopts the open source and free Tomcat7 server. The overall architecture includes performance layer, control layer and so on.

Performance layer is the view layer, the system uses JSP pages plus Struts2 tag library for page representation, page development process using ajax, json, jquery and other technologies. Table 1 shows the developed pages. 12 pages, the main operations that students can do in the page are: register, login, browse, search, add, delete, modify, download, evaluate and score, preview, etc., to access the resources in the innovation and entrepreneurship knowledge map for learning.

Table 1: The pages included in the system

Page name	Page Description
Login.jsp	The login page of the system
Register.jsp	The registration page of the system
Welcome.jsp	On the home page of the system, personalized recommendation information is displayed
EditUserInfo.jsp	Personal information modification page
Upload.jsp	Upload page, responsible for uploading project materials
AllSearch.jsp	Pages that adopt full-text search
ClassfySearch.jsp	Use the interface for searching by the innovation and entrepreneurship category to which the project belongs
KeywordSearch.jsp	The interface that adopts keyword search
ProjectSearch.jsp	Adopt the interface for searching the name of the entrepreneurial project
Vedio.jsp	The interface for video preview
Preview.jsp	The interface for previewing text resources
DownSuccess.jsp	Display the interface of successfully downloaded resources
UploadSuccess.jsp	Display the interface for successfully uploading resources
Down.jsp	Resource download page

III. A. 2) Control layer

Control layer is responsible for receiving requests (Request) and transmission of responses (Response), Struts2 by looking at the AcrionMapper will intercept the request delegated to the appropriate Action processing, ActionMapper is a Map-based key-value key-value pairs, the key for the Action's name attribute, the value for the Class corresponding to the processing object class. The value is the processing object class corresponding to Class. Table 2 shows the controllers developed according to the needs of the system. 5 controllers can handle tasks such as login, resource upload, resource download, resource retrieval, resource recommendation request, etc., to improve the effect of the interactive experience of students in the process of innovation and entrepreneurship learning.

Table 2: The actions included in the system

Action name	Function of the action
UserAction.java	Handle requests for login, registration, personal information modification, and system logout
UploadACtion.java	Handle the upload requests of project resources
DownAction.java	Handle the download requests for project resources
ResourceAction.java	Handle full-text search, keyword search, subject category search, project name search, downloaded resources, uploaded resources, resource scoring and evaluation, and resource recommendation requests for resources
ReviewAction.java	Resource preview request

III. B. Study design

III. B. 1) Sample selection

The data for this study came from the freshmen students of the School of Marxism in a university in the year 2023. Since freshmen will systematically study the innovation and entrepreneurship courses in the first academic year, 350 freshmen in this college were taken as the research subjects to understand how their cultural self-confidence was shaped after utilizing the constructed system to assist them in studying the innovation and entrepreneurship courses. Among them, the freshmen were between 18-21 years old, 165 were male and 185 were female, and none of them had been systematically exposed to innovation and entrepreneurship related contents before entering the university.

III. B. 2) Dependent variables

In this paper, the measurement of “cultural self-confidence” is based on the Public Attitude Survey (PAS), i.e., an attitude measurement scale constructed by questionnaire surveys of respondents' answers to relevant questions, and the Likert scale is used to assign values to the answers to all the items, and the score is the sum of the scores of the relevant questions, with the higher scores indicating the higher the degree of cultural self-confidence. Since the Cultural Confidence Scale is composed of multiple items, the reliability of the scale needs to be checked. The reliability test results of the scale yielded a cronbach's alpha coefficient of 0.94, which is higher than 0.65, thus indicating that the scale designed in this paper has a high level of reliability.

III. B. 3) Independent variables

(1) Cultural Identity

Cultural identity is the key to cultural self-confidence. Only by recognizing Chinese culture can one subsequently feel confident for it. Cultural identity consists of four aspects: historical and cultural identity, folk culture identity, food culture identity and language culture identity. When college students have a strong sense of identification with history and culture, folk culture, food culture and language culture, they can feel the unique charm and value of Chinese culture from the bottom of their hearts, and in the long run, this sense of identification will be transformed into cultural self-confidence. For example, the recognition of traditional food culture prompts college students to understand the life wisdom of their ancestors, and this cognitive process can enhance their pride in Chinese culture, and then enhance cultural self-confidence.

In innovation and entrepreneurship wisdom education, cultural identity plays a key role. Innovation and entrepreneurship wisdom education aims to cultivate college students' innovative thinking and entrepreneurial ability, and cultural identity provides a rich cultural soil for this educational process. In the process of using the innovation and entrepreneurship resource base system based on knowledge mapping and knowledge representation module, college students can actively search for relevant entrepreneurial project resources and integrate relevant elements of cultural identity into project learning and creation. For example, based on the identification with food culture, college students can explore entrepreneurial projects with local characteristics of food culture connotations, which can not only inherit and promote Chinese food culture, but also find new business opportunities in innovation. This way of combining cultural identity with innovation and entrepreneurship learning can not only shape the cultural confidence of college students, but also give full play to the auxiliary role of innovation and entrepreneurship wisdom education. The four aspects of cultural identity are used as the independent variables of this dimension, and the level of cultural identity is categorized into five grades: very strong, strong, average, not strong, and very not strong, with a 5-level scale.

(2) Cultural Intelligence Level

The level of cultural intelligence is an important support for cultural confidence and the key to the success of innovation and entrepreneurship wisdom education. The level of cultural intelligence contains 4 aspects: metacognitive cultural intelligence, cognitive cultural intelligence, motivational cultural intelligence, and behavioral cultural intelligence, all of which are closely related to cultural self-confidence and innovation and entrepreneurship wisdom education.

From the perspective of cultural self-confidence, metacognitive cultural intelligence enables college students to reflect on their own cognitive process of Chinese culture, so as to more accurately assess their level of cultural knowledge and enhance their cultural self-confidence. Cognitive cultural intelligence enables college students to better understand different cultural phenomena and cultural values, and this in-depth cognition enables them to better understand the charm of Chinese culture and enhance their cultural self-confidence. Motivational Cultural Intelligence encourages college students to actively learn and disseminate cultural knowledge, and sustained motivation is the source of motivation for the enhancement of cultural self-confidence. Behavioral cultural intelligence is embodied in the ability of college students to appropriately use cultural knowledge for communication and practice, and the improvement of practical ability can consolidate cultural self-confidence.

In innovation and entrepreneurship wisdom education, cultural intelligence is an important tool for college students to transform cultural elements into innovation motivation. Metacognitive cultural intelligence can help college students reflect on the effectiveness of cultural strategies in the process of innovation and entrepreneurship learning. Cognitive cultural intelligence enables college students to tap into the innovation points in the resource pool and find inspiration for innovative design from Chinese culture. Motivational cultural intelligence inspires college students to actively utilize cultural advantages in innovation and entrepreneurship, while behavioral cultural intelligence enables them to integrate cultural concepts into products and services to create culturally competitive innovation and entrepreneurship projects. The improvement and application of cultural intelligence helps to realize the goal of innovation and entrepreneurship wisdom education, and enables cultural confidence to be reflected and sublimated in practice. The four aspects of cultural intelligence level are used as the independent variables of this dimension, and the cultural intelligence level is categorized into five grades: very high, high, average, low, and very low, and the same five-grade scale is used.

III. C. Findings

III. C. 1) Descriptive statistics of impact factors

A questionnaire was set up to survey the first-year students who completed the innovation and entrepreneurship course with the assistance of the constructed system, and a linear equation was constructed to analyze the influence of the innovation and entrepreneurship course based on the constructed system on the aspect of shaping the

cultural self-confidence of college students. In the questionnaire design, 2 questions were set for each influencing factor, totaling 20 questions, as the quantification of the influence of this influencing factor on cultural self-confidence in innovation and entrepreneurship education.

The availability of the sample data was judged by calculating the maximum, minimum, mean and standard deviation of the dependent and independent variables in the sample data. Table 3 shows the results of the descriptive statistical analysis of the factors influencing cultural self-confidence.The standard deviations of the sample data for the eight independent variables are 6.30, 5.57, 5.16, 2.05, 5.47, 6.68, 6.84, and 6.79, which are much smaller than the extreme deviations. This indicates that there is some kind of linear relationship between the independent variables and the dependent variable in the sample data, and therefore the sample data have the data characteristics to apply the linear regression model.

Table 3: Descriptive statistical analysis of influencing factors (N=350)

Category	Variable	Minimum value	Maximum value	Mean value	Standard deviation
Dependent variable	Cultural confidence	20	78	74.35	20.42
Independent variable	Historical and cultural identity	9	35	10.16	6.30
	Identification with folk culture	6	35	9.64	5.57
	Identification of dietary culture	5	40	7.89	5.16
	Language and cultural identity	6	30	6.47	2.05
	Metacognitive cultural intelligence	7	30	28.61	5.47
	Cognitive cultural intelligence	8	40	30.28	6.68
	Motivation, cultural intelligence	9	45	28.51	6.84
	Behavioral cultural intelligence	6	45	29.28	6.79

III. C. 2) Correlation analysis of influencing factors

The correlation between the eight independent variables and cultural self-confidence was analyzed. Figure 2 shows the results of the correlation analysis of the factors affecting cultural self-confidence. In the figure, 1 of the horizontal and vertical coordinates represents the dependent variable “cultural self-confidence”, and 2-9 represent the eight independent variables of historical cultural identity and behavioral cultural intelligence. The P-values of the 8 independent variables and the dependent variable are all less than 0.001, which are not labeled in the graph for the convenience of presentation. Since this is a correlation analysis between the independent variables and the dependent variable, it is sufficient to focus only on the correlation coefficients in column or row 1. The correlation coefficients of the 8 independent variables with cultural self-confidence are 0.624, 0.627, 0.639, 0.635, 0.521, 0.615, 0.637, 0.692, and the correlation degree of all of them is more than 0.5. The lowest correlation is the correlation between Metacognitive Cultural Intelligence, 0.521, and the highest is Behavioral Cultural Intelligence, 0.692.It shows that the impact of innovation and entrepreneurship education based on the knowledge map and the constructed system on shaping the cultural self-confidence of the college students is more through the improvement of students' action power.

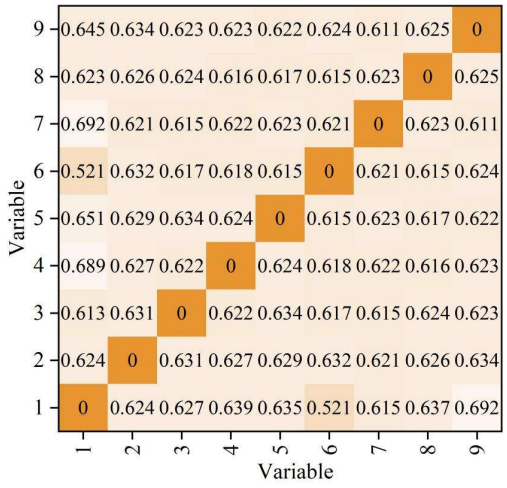

Figure 2: Results of correlation analysis

III. C. 3) Results of multiple linear regression analysis

Table 4 shows the results of multiple linear regression. The adjusted R^2 was 0.805, i.e., the combination of 8 independent variables could explain 80.5% of the variation in cultural confidence. The eight independent variables all had a shaping effect on cultural self-confidence, and the Beta value was greater than 1.600, among which the strongest shaping ability was "behavioral cultural intelligence", Beta=0.241, and the weakest was "folk cultural identity", Beta=0.162. The three independent variables of "linguistic and cultural identity", "motivational cultural intelligence" and "behavioral cultural intelligence" significantly affected the level of cultural self-confidence shaping at the level of less than 0.001. That is, when using the knowledge graph and system of innovation and entrepreneurship education to assist learning, the richer and more vivid and interesting the innovation and entrepreneurship resources of relevant language culture, motivation culture and behavior culture, the more cultural identity and cultural intelligence of college students in these aspects, so as to have more self-confidence in Chinese culture.

Table 4: Statistics of multiple linear regression results

	Variable	R^2	Adjusted R^2	F	Beta	T
Dependent variable	Cultural confidence	0.897	0.805	25.33***	-	-
Independent variable	Historical and cultural identity	-	-	-	0.236	2.29**
	Identification with folk culture	-	-	-	0.162	0.561*
	Identification of dietary culture	-	-	-	0.231	0.270*
	Language and cultural identity	-	-	-	0.223	2.37***
	Metacognitive cultural intelligence	-	-	-	0.200	2.10*
	Cognitive cultural intelligence	-	-	-	0.213	2.12*
	Motivation, cultural intelligence	-	-	-	0.235	2.53***
	Behavioral cultural intelligence	-	-	-	0.241	2.31***

Note:*** represents P<0.001,** represents P<0.01,* represents P<0.05.

IV. Conclusion

This paper combines the TransE model and DeepWalk algorithm to construct an innovation and entrepreneurship resource base system to cultivate college students' cultural self-confidence. After using the resource library for resource search and other auxiliary learning, it is found that the correlation coefficients of historical cultural identity, folk cultural identity, dietary cultural identity and linguistic cultural identity, metacognitive cultural intelligence, cognitive cultural intelligence, motivational cultural intelligence, behavioral cultural intelligence, which are eight influencing factors and cultural self-confidence, are 0.624, 0.627, 0.639, 0.635, 0.521, 0.615, 0.637, 0.692, and there is a linear correlation. The adjusted R^2 of the eight influencing factors is 0.805, which explains 80.5% of the variation in the level of cultural confidence shaping. “Behavioral cultural intelligence” has the strongest ability to shape cultural self-confidence (Beta=0.241), and ‘folk cultural identity’ has the weakest shaping level (Beta=0.162). It is recommended to optimize the dynamic updating mechanism of the knowledge map of innovation and entrepreneurship education in the future, to improve the novelty level of the resources recommended by the recommender system, to match with the development of the society, and to enhance the students' confidence in the current Chinese culture.

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