Kuram ve Uygulamada Eğitim Yönetimi
Educational Administration: Theory and Practice
2022, Cilt 28, Sayı 3, ss: 142-155
2022, Volume 28, Issue 3, pp:142 -155
www.kuey.net

Study on the Application of Chinese Traditional Culture Teaching in Higher Vocational Education

Beibei Jiang [1]

Article History

Submission
30 September 2022
Revised Submission
15 October 2022
Article Accepted
11 November 2022

Abstract

Chinese Traditional Culture (CTC) teaching, among the most significant abilities in higher vocational education, significantly impacts the knowledge of vocational college students. The present focus of vocational education was on how to better cultivate students' CTC understanding and integrity competency through these activities. There should be a strong emphasis in vocational education on developing students' cultural competency by helping them better understand the value of CTC and the alternative stages in which it can be used. This will help students become more comfortable interacting with people while also helping them better understand China's values. This paper presents a novel hybridized long-short-term memory and recurrent neural network (Hybridized LSTM-RNN) to predict the capability of vocational education students. First, collected datasets are standardized through the normalization technique in preprocessing stage to eliminate unwanted errors. Then, Artificial Intelligence (AI) technology is used in the CTC teaching application. The proposed approach is applied in the prediction stage. The performance metrics of this approach are examined and that is compared with certain standard techniques to obtain this research with the greatest effectiveness. The findings of this research are accomplished by employing the Origin tool.

Keywords: Chinese Traditional Culture Teaching (CTCT); Higher Vocational Education; Artificial Intelligence (AI); Multi-Gradient Long-Short Term Memory (MG-LSTM); Origin tool

[1]*Professor, College of Traffic Engineering, Lyceum of the Philippines University, Manila, Philippines, jiangbeibei0622@163.com*

Introduction

China's people have collected five millennia of life experience, which has been condensed into an exceptional traditional culture that has been handed down from one generation to the generation (Zeng et al., 2019). They eliminate the excess and preserve the vital elements of their culture, which they then pass on to future generations of Chinese people. Many great quotations are well-crafted compositions that are rich in moral etiquette culture. Traditional culture has a significant impact on motivating students to develop a positive worldview while also promoting cultural literacy, and high-quality thinking, and enhancing students' willpower and tenacity. Earlier in 2009, the Chinese state authorities said that "China's far-reaching cultural works are a remarkable collection of works from all periods of history." It condenses boundless knowledge and unending ideas into a little package (Guttman et al, 2018). It explains the long-term viability and evolution of humanity and the essential spiritual nourishment for us. Principles and philosophy abound in the polished culture that has been handed down from antiquity. In 2006, the Ministry of Education made it clear that all vocational institutions should "enhance students' cultural connotation and moral character while nurturing technical skills." To cultivate technical talent, colleges must focus on the development of higher vocational students' cultural connotations while also teaching them morals. This is the principle and the most crucial link in the chain. It was recommended by the Ministry of Education in 2011 that "students' involvement in diverse courses might activate their desire for studying". Culture from China is a vital component of current vocational training programs. Chinese traditional culture should be taught at higher vocational schools to increase the quality of vocational education and talent nurturing (Tianfan, 2019). Figure 1 depicts the architecture of the vocational education system.

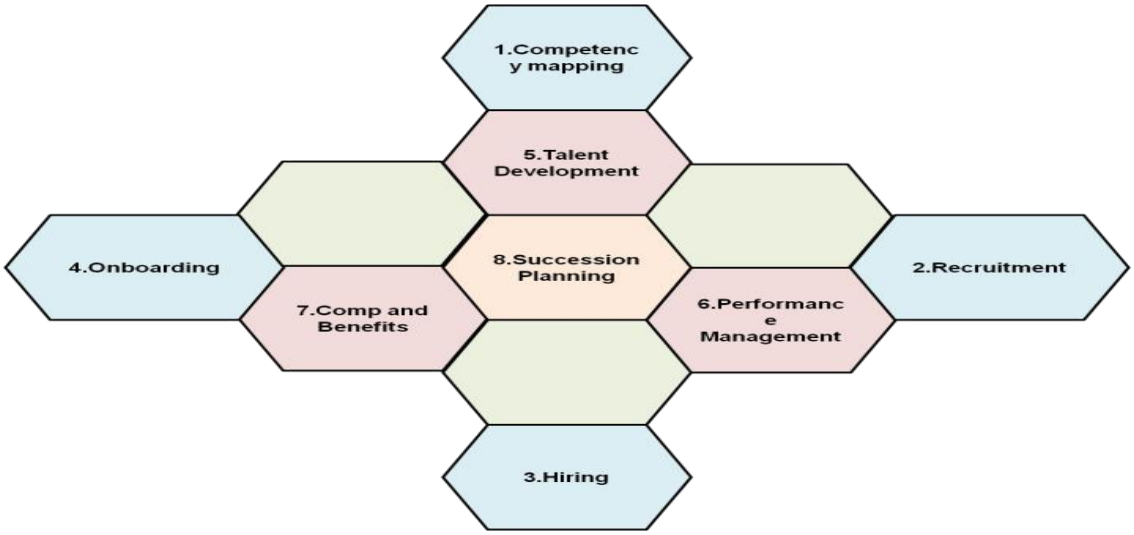

Figure 1. Vocational education system architecture

Teachers and students alike will face a variety of issues throughout its implementation, including inconsistencies in time and space, a short development period for the subject, and a not-yet-fully-mature system. Artificial intelligence has swept through and entered many elements of social life, transforming people's routines and ways of life as well as delving into several professional domains, including education. State Council's "Next Generation Artificial Intelligence Development Plan," released in July 2017, said that "use smart technology to expedite the reform of talent training modes and teaching techniques and establish a new education system that integrates smart learning and interactive learning" (Girasa, 2020). The Ministry of Education announced "Key Points of Education Informatization and Cybersecurity Work in 2019" in March 2019, and the first fundamental aim was to compile the "China Smart Education Development Plan" and organize an international conference on artificial intelligence and education. As of now, there are several educational applications for artificial intelligence that are currently under development. However, there is currently no systematic and mature study on the notion of how to

apply artificial intelligence in teaching CTC. Because of this, we came up with a paradigm that incorporates AI into CTC teaching. The students' abilities are then tested using the Hybridized LSTM-RNN approach to evaluate the method's effectiveness.

Literature Review

Tapani and Salonen (2019) mention that since the beginning of 2018, vocational education in Finland has become competency-based and learner-centered. To better serve their pupils, teachers must now devote more time to focusing on their individual needs. Individual learning plans are developed and a wider range of learning opportunities are made available in the workplace. They also examined what kinds of teacher competencies may be found in Finland.

Sergeeva et al. (2019)explain that there is a growing emphasis in education nowadays on social integration and universality. The purpose of their research is to demonstrate how the process increases the amount of intercultural contact between members of various cultural groups. Understanding between individuals from various cultures is becoming more important as intercultural encounters grow in the contemporary world.

Hidalgo et al. (2020) mention that “Hospitality and Tourism Vocational Education Schools (HTVES)” in Spain are the focus of this research. Additionally, HTVES must serve as a testing ground for new ideas and initiatives in the tourist industry to keep up with changes in operations and management at the organizations where the students will work. In this sense, it would be beneficial for these institutions to learn more about the resources that play a role in the innovation process and how they interact with one another, either enhancing or hindering the process.

Lv, Wu and Shouse (2022) mention that vulnerability to a lack of organizational culture and occupational dedication is becoming an increasing worry as vocational education becomes more important for national development. Chinese industry's ties to the country's educational institutions may be threatened if vocational schools cannot properly produce human capital. Organizational and job characteristics alter these relationships, and that is what this research investigates. Data from 406 instructors from 69 Chinese vocational institutions and universities were analyzed using a multi-layer linear model.

Morselli (2017) mentions that as a cross-curricular topic in compulsory education, this study aims to investigate how educators might teach the crucial competency of an entrepreneurial “Sense of Initiative (SIE)”. To come up with a list of five characteristics of entrepreneurial education, the author looked to the existing literature and the competency-based education movement. Using a questionnaire, a small sample of teachers was asked to identify these five qualities.

Lai, Li, and Gong (2016) investigate cross-cultural teaching situations in this research to see how teachers' agency influenced their professional development. An examination of the perspectives of 14 Chinese language educators revealed a wide range of opinions on the role of the educator initiative in professional development. When teachers were placed in school environments, they were subjected to a variety of social pressures, as well as professional and social expectations, which shaped their agency.

Velde (2009) mention that an in-depth study of the current state of Chinese vocational education is presented in this research. As a result, this article seeks to move away from a narrow definition of "export ready" and instead focus on "compatibility." Analysis of system and institution compatibility between Finland and China is laid forth in their paper.

Liu et al. (2021) recommend generating suspense to guide individual inquiry, organising learning so that students can uncover learning norms, and in-depth examination of students' independent learning abilities to improve classroom efficiency for vocational and technical students. There are two kinds of CNN target detection techniques based on the existing popular methodologies: Once the candidate regions have been formed, they should be classified. The R-CNN series algorithm is a good example of this kind of algorithm based on area recommendations. It's also possible to use a 2-stage detection approach, which does not need the generation of candidate regions, or a 3-stage detection method, which requires so. With PyQt5 as an interface development framework, the CNN model is employed in higher vocational schools to predict and

analyse class attention. This system's code is written in the Python programming language.

Mago et al. (2021) mention that when it comes to education, the pandemic of COVID-19 has disrupted the sector significantly, which is seen as an important economic indicator. Even industrialised nations are fighting COVID-19 to minimise the economic effect of a long-term lockdown on their economies. Work-from-home (WFH) culture is being developed by organisations to minimise losses to all stakeholders. The education industry is no exception, and the distribution of academic content has been severely impacted. Around the world, there has been an unexpected and rapid shift away from traditional classroom methods toward online and virtual ones. When it comes to the long-term viability of online education during a pandemic, there is a lot of debate. Hence, the effect of lockdown on the teaching-learning process was examined. Many different educational institutions in Punjab participated in the survey, which gathered answers from their pupils. Fuzzy logic approaches have been used to gather, evaluate, and analyse responses connected to online teaching to determine the systemic influence of online learning on education under the current regime.

Chen (2021) illustrates that a new college English education environment is being created as a result of the profound integration of AI and education. As part of this study, researchers look into and analyse how well students can adapt to AI-supported English teaching, and they provide recommendations for how those students might enhance their adaptability going forward.

de Oliveira Silva et al. (2020) depict that students' satisfaction at “Higher Technical-Vocational Education (HTVE)” institutes may be predicted using a model of antecedents and consequences. HTVE students in Brazil were asked to participate in a survey to test the concept. Modeling the structures and their relationships using structural equations was employed in this study. This study found several factors that influence student satisfaction, including service quality, student learning outcomes, and employment opportunities. While revising a curriculum to match the needs of the workforce and improving the quality of the HTVE system, students' views and employment outcomes should be considered.

Radianti et al. (2020) illustrate that VR's promise in teaching has been sparked in a recent study. There is a limited systematic study on how academics have used immersive VR in higher education with high-end and cheap head-mounted displays (HMDs). So, the author recommends employing systematic mapping to discover VR design features in higher education research. The examined papers were obtained by extracting important information from documents in four scientific digital libraries. These three key elements are examined to see whether VR-based learning may succeed: the current domain structure in terms of learning materials, VR design components, and learning theories. The mapping between application domains and learning material and design components and learning content was done.

Kincheloe (2018) examines how employees are schooled to fit into the current labor-unfriendly economic system via several organisations. The author shows how vocational education impacts the political climate of the time by examining its origins and aims.

Sh et al. (2020) cover how to combine forms of education, their content, and creative ways of education. The study's purpose is explained. The educational cluster is a scientifically-pedagogically supported innovation with effective working mechanisms. The study's purpose, topic, and methodology are discussed. The phases of cluster creation, cluster features, and quality operating mechanisms are scientifically supported. Analyses of issues affecting the development of the innovative cluster of teacher education and their solutions at the "School-Laboratory" experimental locations are provided.

Khairullina et al. (2015) illustrate that applying bachelor's degree programmes to secondary and higher levels of vocational education. Justifies the organisational and pedagogy conditions of applied baccalaureate programmes, presents the initial effectiveness of applied bachelor programmes in higher and secondary vocational education, identifies the peculiarities of application programmes and academic bachelor degree programmes, and highlights the pros and cons of associative learning.

Khaled et al. (2014) mention that using hands-on simulations in creative curricula is discussed in this work in a more clear conceptual manner. When comparing hands-on training to other work environments, a comprehensive literature review found that some constructivist

qualities and outcomes were under-exposed in empirical studies concerning simulations. Based on further research on two basic aspects of constructive vocational learning (i.e. authenticity and boosting students' ownership), the findings suggest how hands-on simulations might add value to the innovative curriculum in this area. Design and implementation methodologies for hands-on simulations from the idea of social constructive learning are presented in this study to help students develop not just technical and procedural abilities, but also their competencies and professional identities.

Hidayat et al. (2019) illustrate that in particular in Indonesia, the high level of unemployment among recent college graduates is a cause for concern. There are several reasons behind this, including a lack of self-sufficiency, character, and entrepreneurial skills among graduates. At the beginning of a student's education, entrepreneurial learning is critical. This study examines and explains this need analysis. Thirty students from West Sumatra universities participated in this study, and all of them had an entrepreneurial mindset. Descriptive statistics and differential item functioning (DIF) using Rasch analysis were used to analyse the data.

Ling, Chung and Wang (2021) depict that with the fast expansion of Higher Vocational Education in China, the goal is to increase its quality overall. It used knowledge-based education for a long time. Ability-based education was established progressively until the early 1990s. Higher vocational education research should go outside the classroom. Many laws and procedures have been developed to stimulate growth, and vocational education has expanded. China's higher education now includes vocational training. It's a kind of higher education and vocational training. Higher vocational institutions need a personality-based education strategy to develop students' personalities. Improve talent training method and quality. High-quality technical skills are needed in an innovation-driven society. It's a huge practical difficulty for contemporary vocational education.

Problem statement

CTC ensures the l also developing their technical abilities. Because of the implementation of CTC in education, both students and instructors are faced with several educational challenges. As a result of this study, a new model for CTC instruction that includes artificial intelligence has been developed.ong-term sustainability and progress of humanity, as well as providing individuals with the spiritual nourishment they need. The education department made it clear that all vocational institutions should work to improve students' cultural connotations and moral character while

Methodology

In this section, the application of CTC teaching in higher vocational education is discussed in detail. Figure 2 depicts the schematic representation of the suggested methodology. Initially, datasets were collected and preprocessed using normalization technique. And then Artificial Intelligence (AI) is integrated into CTC teaching. Then the students' abilities are tested using the Hybridized LSTM-RNN approach to evaluate the method's effectiveness.

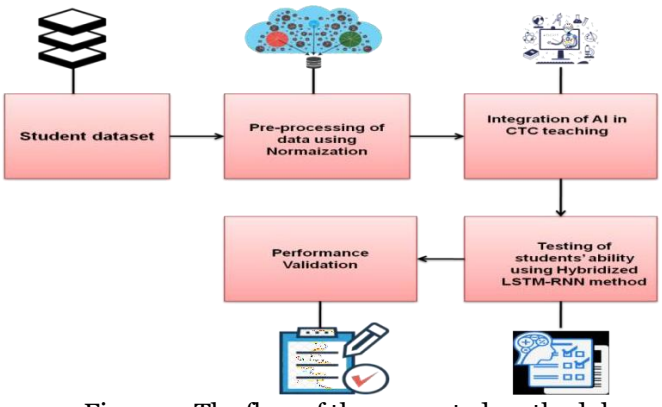

Figure 2. The flow of the suggested methodology

Data collection

Education and training for jobs can be obtained in China at one of four different levels, namely: lower secondary schools (a very small and declining sector); upper secondary vocational schools (in various educational institutions); tertiary education (primarily in 3-year vocational colleges); and adult education and on-the-job training. Lower secondary schools are a very small and declining sector. Table 1 illustrates how Chinese vocational schools may be broken down into public and private institutions based on their funding sources. In 2009, there were 1181 vocational institutions; about 272 of the schools, or 23 percent, were private colleges. The remaining 77 percent were state colleges. There were a total of 635 public institutions that were owned by either central or local governments, 84 public institutions that were affiliated with state-owned enterprises, 173 public institutions that were affiliated with industry associations, and 17 public institutions that belonged to other public agencies (Velde, 2009).

Table 1. Vocational Colleges types (2009)

Sector		**2009**	
		No of Institutions	**Percentage**
Private	Individual or Social Organization	272	24.03%
Public	State-owned Enterprises	84	8.11%
	Industries	173	12.65%
	Government	635	52.77%
	Others	157	2.44%
	Total	1181	100%

Source: MOE 2009 Vocational Higher Education Institution Talent Cultivation Data Collection Platform.

Preprocessing using Normalization

Most Data Mining Systems employ data transformations like normalisation as a pre-processing approach. Attribute data is normalised by making sure that the values of the attribute fall within a predetermined range, such as 0.0 – 1.0. Classification methods that employ neural networks or distance measures, such as closest neighbour classification and clustering, benefit greatly from normalisation. Prior to modelling, normalisation smooths and normalises data. To implement the approach, one simply uses conventional mathematical transformations like normalisation, z-score normalisation, logarithmic normalising, or decimal scaling normalisation to normalise numerical columns. In data sets with extreme values, finding patterns might be more challenging. This may be especially useful if the data is very irregular, has extreme highs and lows, or includes values that are dispersed or do not follow a Gaussian distribution. Min-max normalisation, z-score normalisation, and decimal scaling are all examples of data normalising techniques. Our students' data is preprocessed using Z-score normalisation here.

Z-score normalisation refers to the process of normalising every value in a dataset is carried out in such a way that the mean of all of the values is equal to zero and the standard deviation equals one. The Z-transform technique of data normalisation was used for this research to ensure that the data normalisation phase was completed correctly. Additionally, it is advocated that, to ease the modelling process, sampling methods be used, since the analysis of vast amounts of data might be time-consuming and expensive. To remove unnecessary mistakes from a dataset, we conduct a z-score normalisation on every value in the dataset using the following equation:

$$\text{New value} = \frac{(y-\mu)}{\sigma} \qquad (1)$$

Where the original value is represented as y, mean as , and standard deviation as . The key to reducing the size of the data collection is data cleansing. It takes more time and computing resources as the dimension rises.

Integration of AI in CTC teaching application

“Computer Science”, “Cybernetics”, “Informatics”, “Linguistics”, and other majors have

successfully intertwined to advance the development of AI. It has already shown considerable benefits in education and teaching as one of the three most important technologies of the twenty-first century. The findings of AI research are vital to all elements of education and teaching, and they directly impact the quality of teaching. Teachers of teaching CTC must have an abundance of knowledge, and AI can become the knowledge outsourcing of human teachers, which means that knowledge is the research object, through computer hardware and software, and AI expert technology is used as techniques to create a continuous and huge knowledge base reserve.

Teachers must deal with a variety of "diversities" while teaching CTC, including cultural diversity, language differences, and knowledge diversity. Because students in the same class may come from all over the world, the presentation of the educational impact will be influenced by their diverse experiences and cultural backgrounds. How to educate students according to their ability is a challenge that cannot be overlooked, and AI may achieve tailored demand perception by collecting student-specific data and then presenting it to instructors as data or text. AI may work as a multi-functional assistant in the teaching process, assisting CTC instructors in completing several educational tasks. The true quality of teaching remains in the hands of CTC instructors; AI just gathers and combines hazy data and delivers it to them in a particular and unambiguous manner; genuine decision-making power is ultimately in the hands of teachers. Artificial intelligence exists as a subordinate to human Chinese teachers in this situation, which is known as the "AI assistant + teacher" method.

Testing of students' ability using Hybridized LSTM-RNN method

Deep Learning Architecture

One of the machine learning strategies that makes use of artificial neural networks (ANN) is referred to as deep learning. A multi-layer neural network is the foundation of a deep learning network. The term "deep learning networks" refers to a collection of many types of neural networks, such as "deep neural networks" (DNN), "convolutional neural networks" (CNN), "recurrent neural networks" (RNN), and "deep belief networks" (DBN), amongst others. We test the students' ability using Hybridized LSTM-RNN method.

RNN

Nodes in an RNN are connected in the same way neurons are connected in a human brain. Like synapses in the actual brain, neural network connections may convey impulses to other neurons/nodes. Afterward, the artificial neuron analyses the incoming signal and sends it on to the other neurons/nodes to which it's linked. Weights are often used in neurons and connections to fine-tune the learning process. It is possible to change the weight to alter the intensity of the signal as it moves from the input layers to the output layers. In an ANN, there are layers between the input and output that are not visible to the user. At least three hidden layers are required for an RNN to function properly. Hidden units execute all the computations by adjusting the weights to create the outputs in RNNs' fundamental architecture, which consists of input units, output units, and hidden units. Only one direction of information flow occurs between the incoming and the outgoing unit, which is the input unit. The RNN model features an error comparison and weight adjustment directional loop, which is compared to the preceding hidden layer. Figure 3 depicts a basic RNN structure with two hidden layers.

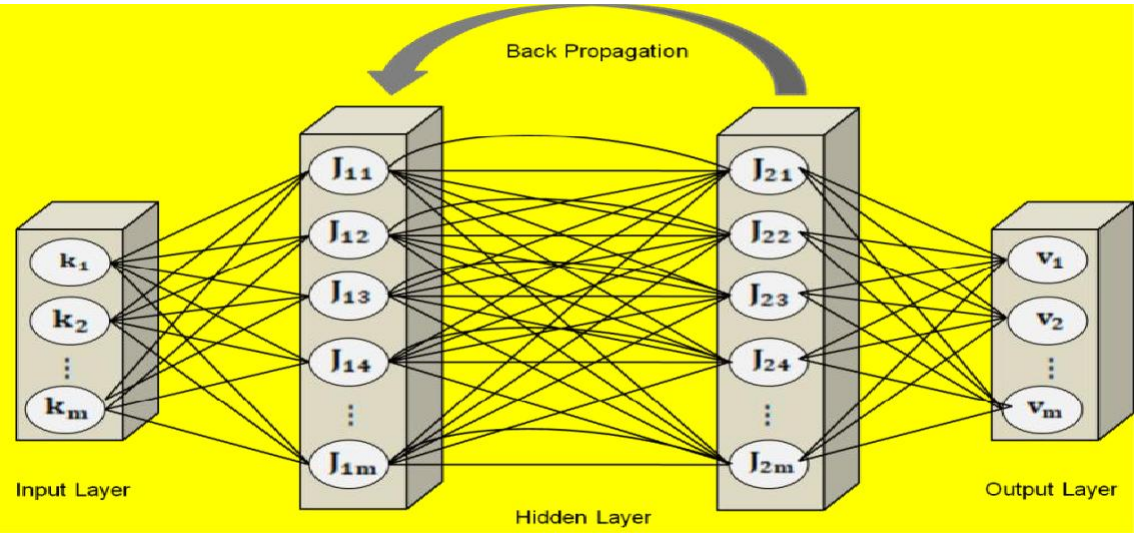

Figure 3. A simple RNN.

Traditional feed-forward neural networks (FFNN) have been extended to include RNNs as a variant. It is important to note that FFNNs do not have any loops or cycles in the network; instead, information flows solely in one way, from the input nodes to the output nodes. Traditional FFNNs do not need the use of hidden layers. Assume that we have an input vector sequence (K), a hidden one (J), and an output vector sequence (V). K = (k 1,k 2,..,k R) is an input vector sequence. This is how the output vector V=(v 1,v 2,..,v R) and the hidden sequence V=(v 1,v 2,..,v R) are computed using a standard RNN with r = 1 to R:

$$j_r=\sigma(E_{kj}k_r + E_{jj}j_{r-1} + n_j) \quad (2)$$

$$v_r = E_{jv}j_r+n_v \quad (3)$$

where nonlinearity activation function is denoted by σ, a weight matrices by E and bias term n in this equation. Calculate the hidden layer's output at each successive t-time step using Equation (2) and notice that the preceding hidden layer's output is denoted by .

RNNs cannot construct more than 5–10 time steps. Using gradient-based learning techniques to update the weights of an RNN may result in a vanishing gradient issue. At the end of each training cycle, the weights are recalculated using a new fractional derivative of the error function. Although it's rare, the gradient may be as tiny as a hair. Error signals may appear or disappear, making it impossible for the weight to change. The fluctuation in weights might be caused by these disappearing erroneous signals. Learning takes too long or doesn't function at all when there's a vanishing mistake. Supervised classification learning may be accomplished using RNNs. Due to disappearing and bursting gradients, it is difficult to teach them. Incorrectly given weights are the root cause of gradients disappearing and exploding (assigned to either very high or very low value). An RNN is typically used to address the training difficulties of an LSTM with forget gates. A useful option for tackling time series sequence prediction issues is RNN.

Long Short-Term Memory

The vanishing error issue may be mitigated with LSTM. LSTM is capable of learning to bridge more than 1000 distinct time steps at a time. The hidden layer of LSTM networks is replaced with memory blocks. A minimum of one memory cell is required for each memory block. Figure 4 depicts a single node in a simple LSTM network. Regulating gates trigger memory cells. Incoming and outgoing information is regulated by these gates. Between an input gate and an output gate is a forget-gate. If the stored information is no longer required, forget gates may reset the linear unit's state. Simple sigmoid threshold units, these gates are. From 0 to 1, these activation functions are obtainable.

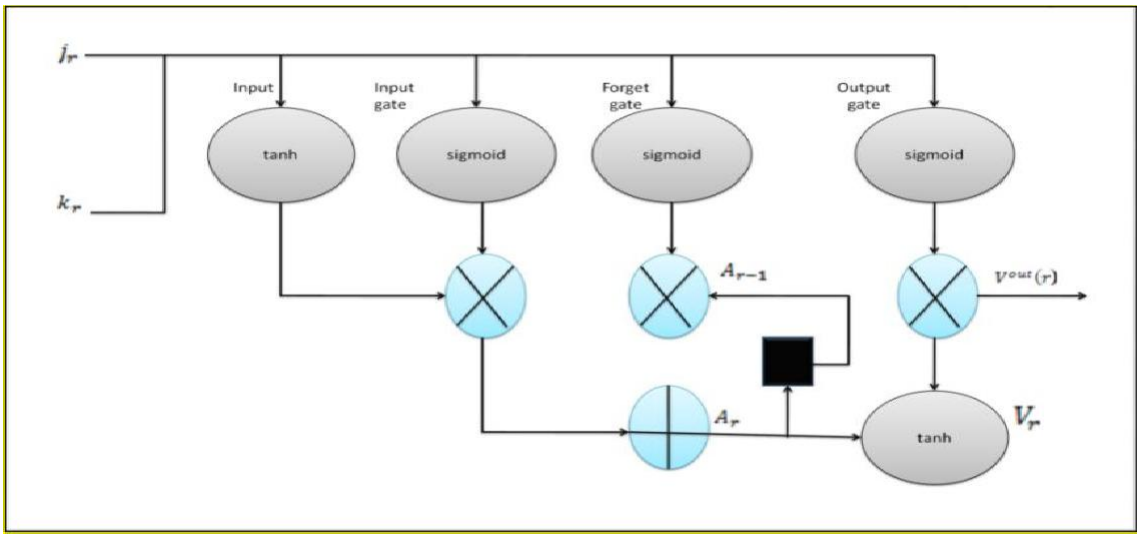

Figure 4. One cell in a basic LSTM network

Figure 4 depicts the output of an LSTM memory cell.

$$v^{dh}(r) = v^{out_h}(r)j(a_{d_h}(r)) \quad (4)$$

Output gate activation, gate internal state, and hidden layer output are all referred to as and j.

Hybridized LSTM-RNN method

Using the Hybridized LSTM-RNN technique, the ability of the students to learn AI-based CTC education may be tested to see how successful the system is. The capacity of RNN's internal state to represent dynamic temporal features makes it an ideal DL (deep learning) structure for processing time series data. To counter this tendency toward gradient fading, increasing the weight matrix by a factor larger than the reciprocal of the tanh (from 0 to 1) function will cause it to become more likely that the interval of data will get longer. The phenomenon of gradient fading in normal RNN may be effectively ameliorated by LSTM as an enlarged version of RNN. LSTM may employ long-time sequence data with a gate control method to determine if an input should be recalled or deleted. Memory blocks with three different types of gates replace RNN neurons in LSTM (input, forget, and output gates). These equations (5 to 10) may be used to describe LSTM memory blocks' computed data.

$$f_p^m = \sigma\left(T^m X_p + K^m s_{p-1} + \xi^m\right) \quad (5)$$

$$f_p^r = \sigma\left(T^r X_p + K^r s_{p-1} + \xi^r\right) \quad (6)$$

$$m_p^c = \tanh\left(T^{m} X_p + K^{m} s_{p-1} + \xi^{m}\right) \quad (7)$$

$$c_p = e_p^m * c_{p-1} + f_p^r * m_p^c \quad (8)$$

$$f_p^o = \sigma\left(T^o X_p + K^o s_{p-1} + \xi^o\right) \quad (9)$$

$$c_p = f_p^o * \tanh\left(c_p\right) \quad (10)$$

Here, f_p^m=forget gate at time p, f_p^r=input gate at p, f_p^o=output gate at p, m_p^c= input candidates stored at p, c_p=memory cells, s_p=hidden state at p, X_p=input vectors at P, ξ^m=bias vector of forget gate, ξ^r=bias vector of input gate, ξ^o=bias vector of output gate. Then T^m, T^r, T^m, T^o, K^m, K^r, K^m, K^o are related weight matrices. The " Hadamard product " was indicated as among two matrices. Furthermore, and were termed as activation functions.

Students' ability data was classified using hybridised LSTM-RNN in this study. The Hybridized LSTM-RNN with LSTM hidden layer has been created for classification. The number of hidden and concealed units is determined by trial and error for all hidden levels. There are four main types of abnormalities and noisy areas that may be categorised by the succeeding layers, which include five neurons each. When training, holdout cross-validation was utilised instead of standard k folds because of the evident LSTM-DL overhead. LSTM-RNN training and verification datasets are split into two separate sets for this purpose. As a consequence, the accuracy rate is low, suggesting that it is not well-fitting the model. The challenge becomes more difficult as the number of hidden layers increases. Overfitting is a term used to describe a network that has the

best training accuracy but the worst verification performance. There are no issues with the LSTM working properly or keeping track of training time when it is set to 5. It is advised that 5 frames of input be given into the LSTM algorithm. Hybridized LSTM-RNN technique is exposed to a lengthy training process as a consequence.The amount of time spent on training has decreased and it successfully evaluates the students' ability.

Results

Research on the application of CTC teaching in higher vocational education was the study's primary objective. In this section, we will discuss the results of the students' abilities which are tested using the Hybridized LSTM-RNN approach. Origin pro simulation tool is used to run the proposed approach. To prove the effectiveness of our proposed method, we compare our method with traditional methods such as CNN (Liu et al., 2021), Fuzzy logic (Mago et al., 2021), and LSTM (Chen, 2021). Figures 5 and 6 depict the students' critical thinking skills and performance ratio. The proposed methodology outperforms the existing methodology.

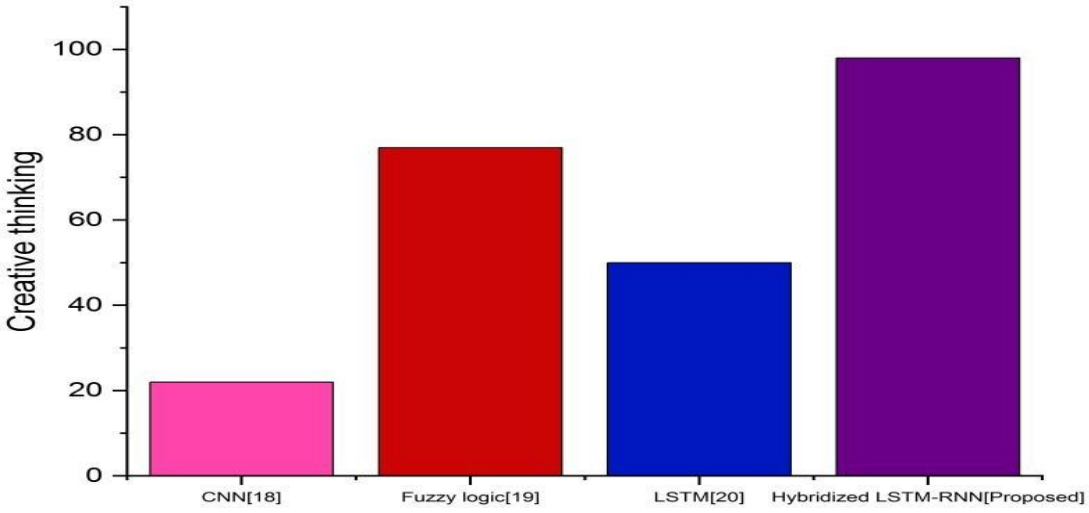

Figure 5. Creative thinking skills

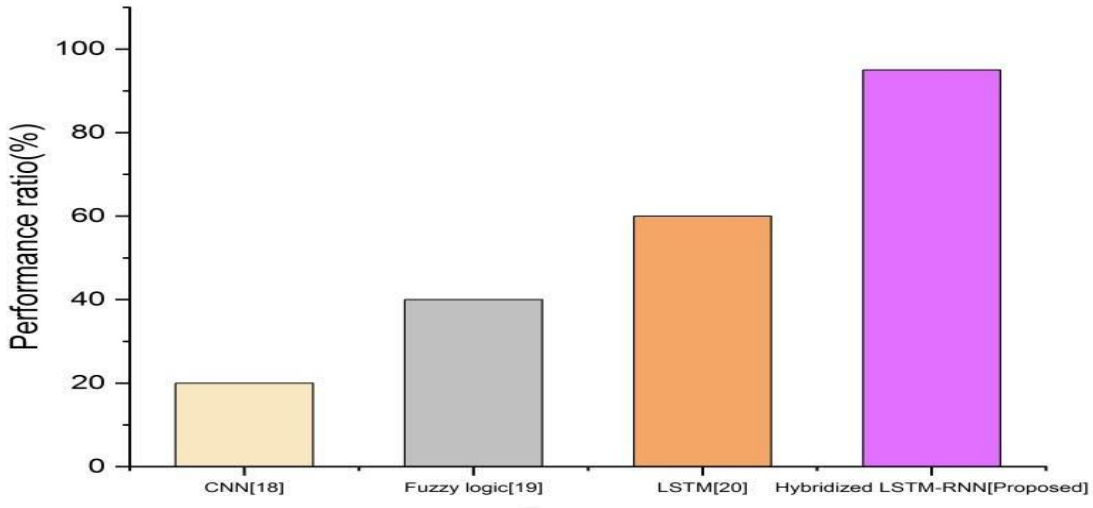

Figure 6. Performance ratio

Psychological skills or mental skills are tools for the mind. This includes skills like satisfaction, stress management, anxiety reduction, learning methods, and emotional stability. Improved psychological skills can enhance academic performance and the overall well-being of a student.

Figure 7 depicts the psychological skills of a student learning AI-based CTC education.

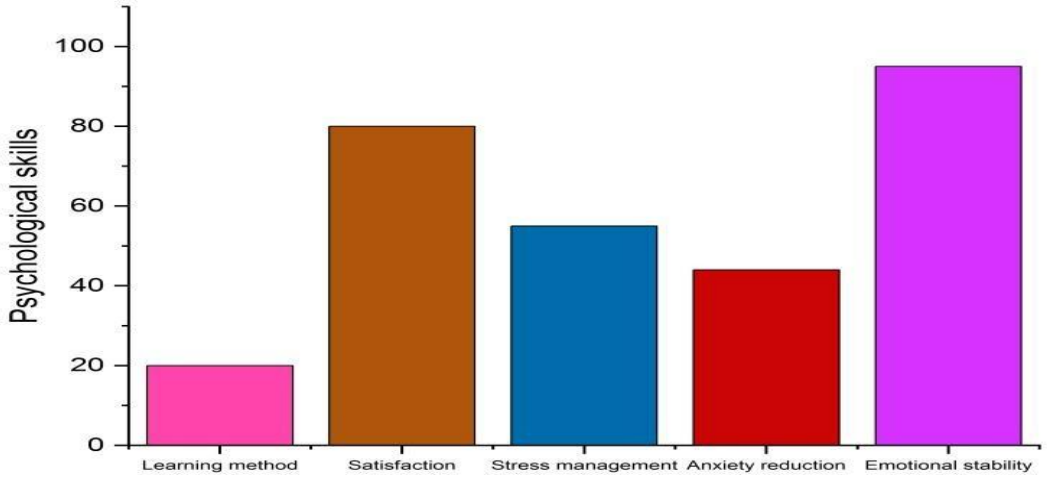

Figure 7. Psychological skills

Mental ability is defined as a capability involving creativity, self-regulation, planning, abstract thinking, complex idea comprehension, and learning from experience. Figure 8 depicts the attitude and mental ability of a student learning AI-based CTC education.

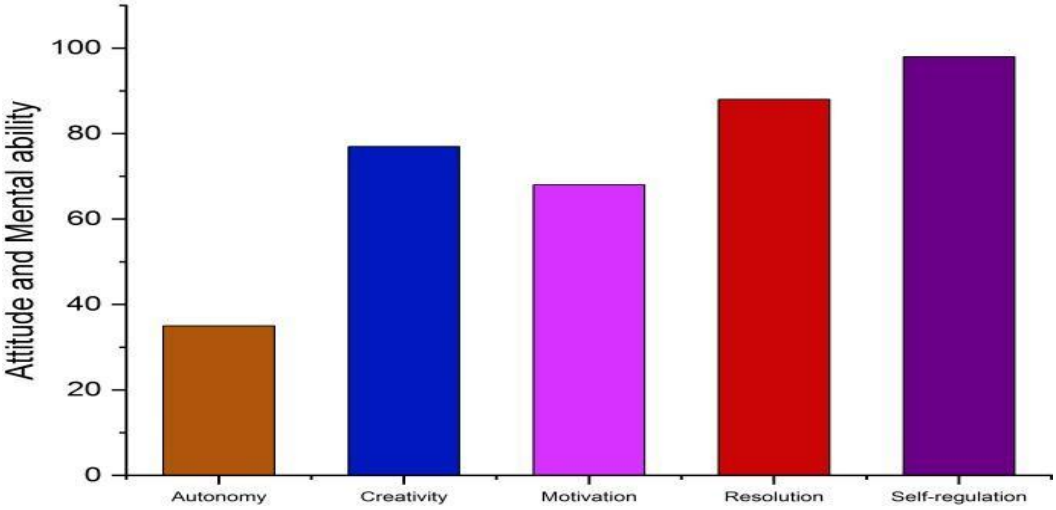

Figure 8. Attitude and mental ability dimensions

Discussion

As shown in figures 3 and 4, the proposed technique outperforms the existing methods in terms of critical thinking and performance ratio because CNN is significantly slower due to operations such as max pool, while the accuracy of the fuzzy logic system is compromised because the system relies on inaccurate data and inputs. Gradient exploding and disappearing issues are common in LSTM.

Conclusion

Higher vocational education in China has made significant strides in both size and quantity as a result of the fast expansion of the social economy in the country. Higher vocational education's active growth is not only an educational and academic concern but is also a strategic issue for

social development and worldwide competitiveness as a whole. Higher vocational education should not be studied and researched just inside the walls of academic institutions. To fully understand it, it must be investigated and analysed from a variety of disciplines and viewpoints, including "history and culture", "society", "economics", "science", and "administration and policy." AI-based CTC teaching in higher education is the focus of this study. AI+ teaching CTC mode is not only more efficient and effective to teach CTC practise, but it also changes educational conceptions, develops new teaching objectives, and transforms educational modes. The uniqueness of students is frequently overlooked in traditional education and instruction, and more of it is factory processed. It is more straightforward to identify students' interests and commonalities when using the technique that has been provided. It's a paradigm shift in education. The development of students' core literacy is the primary goal in today's technologically advanced world.

References

Chen, S. (2021). Design of internet of things online oral English teaching platform based on long-term and shortterm memory network. *International Journal of Continuing Engineering Education and Life Long Learning, 31*(1), 104-118. https://doi.org/10.1504/IJCEELL.2021.111839

de Oliveira Silva, J. H., de Sousa Mendes, G. H., Ganga, G. M. D., Mergulhão, R. C. & Lizarelli, F. L. (2020). Antecedents and consequents of student satisfaction in higher technical-vocational education: evidence from Brazil. *International Journal for Educational and Vocational Guidance*, *20*(2), 351-373.

Girasa, R. (2020). International Initiatives in AI. In *Artificial Intelligence as a Disruptive Technology* (pp. 255-298). Palgrave Macmillan, Cham.

Guttman, D., Young, O., Jing, Y., Bramble, B., Bu, M., Chen, C., ..., & Liu, L. (2018). Environmental governance in China: Interactions between the state and "nonstate actors". *Journal of Environmental Management*, *220*, 126-135.

Hidalgo-Peñate, A., Nieves, J., & Padrón-Robaina, V. (2020). The influence of employees' knowledge, organisational commitment, and culture on the innovativeness of vocational educational. *Knowledge Management Research & Practice*, 1-12.

Hidayat, H., Ardi, Z., Yuliana, & Herawati, S. (2019). Exploration of the need analysis for technopreneurship scientific learning models in higher vocational education. International Journal of Economics and Business Research, 18(3), 356-368.

Khairullina, E.R., Valeyev, A.S., Valeyeva, G.K., Valeyeva, N.S., Leifa, A.V., Burdukovskaya, E.A. & Shaidullina, A.R. (2015). Features of the programs applied bachelor degree in secondary and higher vocational education. *Asian Social Science*, *11*(4), 213.

Khaled, A., Gulikers, J., Biemans, H., van der Wel, M., & Mulder, M. (2014). Characteristics of hands-on simulations with added value for innovative secondary and higher vocational education. *Journal of Vocational Education & Training*, *66*(4), 462-490.

Kincheloe, J. L. (2018). *How do we tell the workers?: The socioeconomic foundations of work and vocational education*. New York, USA: Routledge.

Lai, C., Li, Z., & Gong, Y. (2016). Teacher agency and professional learning in cross-cultural teaching contexts: Accounts of Chinese teachers from international schools in Hong Kong. *Teaching and teacher education*, *54*, 12-21.

Ling, Y., Chung, S. J. & Wang, L. (2021). Research on the reform of management system of higher vocational education in China based on personality standard. *Current Psychology*, 1-13.

Liu, X., Li, G., Xu, L., & Wu, Y. (2021). Predictive Analysis of Class Attention Based on CNN Model. In *Journal of Physics: Conference Series*, *1852*(2), 022008

Lv, Y., Wu, M., & Shouse, R. C. (2022). Impact of organizational culture, occupational commitment and industry-academy cooperation on vocational education in China: Cross-sectional Hierarchical Linear Modeling analysis. *PloS one*, *17*(2), e0264345.

Mago, N., Mago, J., Mago, S., & Dang, R. K. (2021). Analyzing the Impact on Online Teaching Learning Process on Education System During New Corona Regime Using Fuzzy Logic Techniques. In *Predictive and Preventive Measures for Covid-19 Pandemic,* 69-85.

Morselli, D. (2017). How do Italian vocational teachers educate for a sense of initiative and entrepreneurship? Development and initial application of the SIE questionnaire. *Education+ Training, 60*(7-8), 800-818.

Radianti, J., Majchrzak, T. A., Fromm, J., & Wohlgenannt, I. (2020). A systematic review of immersive virtual reality applications for higher education: Design elements, lessons learned, and research agenda. *Computers & Education*, *147*, 103778.

Sergeeva, M. G., Poliakova, I. V., Goltseva, O. S., Kolosova, G.M., Shafazhinskaya, N. E., Polozhentseva, I. V., & Smirnova, M. A. (2019). Development of teachers' cross-cultural literacy in the system of further vocational education. *Religación. Revista de Ciencias Sociales y Humanidades*, *4*, 249-254.

Sh, M., Toshtemirova, S., Ahmadjonov, B., & Koshanova, N. (2020). Structure and Mechanisms of Action of the Educational Cluster. *International Journal of Psychological Rehabilitation*, *24*(07), 8104-8111.

Tapani, A., & Salonen, A. O. (2019). Identifying teachers' competencies in Finnish vocational education. *International journal for research in vocational education and training*, *6*(3), 243-260.

Tianfan, K. (2019). Effective Introduction of Excellent Traditional Culture Education in College Chinese Teaching. In *2019 5th International Workshop on Education, Development and Social Sciences (IWEDSS 2019)* .

Velde, C. (2009). Employers' perceptions of graduate competencies and future trends in higher vocational education in China. *Journal of Vocational Education and Training*, *61*(1), 35-51. https://doi.org/10.1080/13636820902819974

Zeng, N., Xiong, Z., Li, W., Sun, Z., & Li, X. (2019). Effects of seat position on perception of power in Chinese traditional culture. *Asian Journal of Social Psychology*, *22*(1), 74-83.