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A Study on Construction of Education Management System for University Party Members in Online Public Opinion of the Epidemic - A Case Study of Chongqing Polytechnic

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Abstract: - One of the main initiatives towards achieving national quality education is basic education. Enhancing ecological carrying level of elementary education is crucial for sustainable and well-coordinated growth of the local economy and society. Using the DPSIR theoretical model in conjunction with Chongqing panel data from 2011 to 2017, a thorough assessment index method was developed. Regional as well as temporal evolution characteristics of the ecological carrying capacity of county education in Chongqing were investigated through the application of statistical analysis and vocational analysis methodologies. This study propose novel technique in vocational and statistical education analysis in Chongqing Polytechnic college based on data analysis using machine learning techniques. Here the vocational and statistical education system based students interest data has been collected and analysed using recurrent long term support vector neural networks. The experimental analysis is carried out for parameters like precision, recall, and F1- score, accuracy for training data and validation accuracy. In order to give information majors at vocational colleges and public industrial education integration training bases a thorough knowledge and to serve as a reference for future research, examine the practical teaching method for talent cultivation in the information industry.

Keywords: Chongqing Polytechnic college, vocational analysis, statistical analysis, machine learning, recurrent long term

1. Introduction:

With a 10.7% economic growth rate in 2016, Chongqing overtook all other regions in China as the only one maintaining strong economic growth under the country's new normal. As such, it is imperative to investigate the underlying causes of this region's exceptional economic success. As the standard Cobb-Douglas production function, Y = AF (K, L), illustrates, labour input, capital investment, and technology level all affect economic growth [1]. One of the most important ways to address the structural mismatch between labour supply and demand today is through vocational education, which produces professionals with the skills and requirements of a variety of industries in mind. The gap between actual industrial need and higher education in China is currently increasingly pronounced. Chongqing has aggressively advanced vocational education in recent years. There are approximately 736,000 students enrolled in Chongqing's 254 vocational schools as of the first half of 2017. Vocational education in Chongqing has produced 1.1 million new members of society in the last five years. August 2007 marked the completion of the Australia China (Chongqing) Vocational Education and Training Project's (ACCVETP) implementation [2]. Following AusAID's receipt of the Activity Completion Report, the project's Technical Advisory Group (TAG) was assigned two tasks. These were to examine and offer feedback on the ACR and to deliver the Independent Completion Report (ICR) to AusAID. By most objective standards, the ACCVETP was a success and gave the PRC invaluable assistance in developing its VET policy moving forward, as well as in building industry connections, managing institutions, and facilitating teaching, learning, and evaluation. Each ACCVETP component's comprehensive statistics and data are contained in the ACR and are not reproduced in this ICR. By all standards, a design approach that sought to make an influence at the school, municipal, and national levels was ambitious in a nation with the geographic, demographic, and cultural variety of China [3]. It depended on the assimilation and subsequent application of lessons learned, as well as the upward and downward flow of information. It was believed that all three of the Vertical Slice's levels' partners would work closely together and in a supportive manner. Furthermore, the attainment of this objective was significantly dependent on the willingness of local and national Chinese authorities to accept radically different, unproven Australian methodologies and to have faith in their applicability or adaptation to the particular Chinese situation. China had studied other nations' VET systems in previous decades, such as those of Germany, the UK, Canada, and Russia, so adopting Australian methods of skill development was by no

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means a given. Several ACCVETP employees were asked to contribute information and ideas to other donor programmes to support the PRC in VET reform in order to ensure that some degree of uniformity happened [4]. A lack of success and concrete accomplishment at the school level would inherently preclude any meaningful influence at the other two levels and might potentially harm the impression of Australian Vocational Education and Training (VET) as a high-quality system. Comparing the Vertical Slice design to an activity that concentrated on just one or two levels of involvement, it was likely more risky in these aspects. Real impact was evident at every level, and numerous ambitious outcomes in the Vertical Slice approach appear to have been realised, which is a tribute to the ACCVETP partner agencies (most notably MOFCOM, MOE, and CQMEC) and the strong dedication of the combined field team in CQ. The management of education has a direct bearing on its success. China's national education system has always exhibited some political traits since its founding, and its administration follows Party and government policies. To a certain extent, the comprehensive teaching level of colleges and universities is also reflected in their management. One of the main issues facing today's Internet development environment is how to enhance management techniques and outcomes. In Hongying, university demands for data analysis have increased significantly. Using machine learning algorithms can help university administration run more smoothly and enhance the quality of instruction during this era of machine learning prosperity [5].

2. Background and related works:

Chongqing Jiaotong University in China requested that Swansea University create a specially designed training programme for a visiting group of their academics. In addition to non-engineering-specific courses like management, science, economics, and the arts, Chongqing Jiaotong University is a multidisciplinary university with a focus on civil engineering specialisations like bridge and structure engineering, harbour and waterway transportation, and engineering [6]. The delegates had opportunity to enhance their proficiency in the English language, specifically in technical language utilised in engineering, and broaden their network of professional contacts for the future. The information and experience they gained from Swansea University enabled them to contemplate and execute alternative approaches in their respective departments at Chongqing Jiaotong University." These lectures go into great detail about the UK's higher education system, including quality control, student services, student grievances and appeals, and Swansea University's objective. In my capacity as a professor at a Chinese institution, the subjects were novel and motivating [7]. Advanced vocational education is described by Work [8] as functional activities that employ knowledge education as the foundation, vocational course training as the carrier, and schools as the topic of implementation. Through these activities, students can enhance their professional ethics and job abilities, satisfy societal needs, combine theory and practice, and focus on employment. It is further divided into primary vocational education and vocational edu According to author [9], the idea and route for vocational education to advance towards luxury and pursue greatness is the merger of industry and education. According to Work [10], fostering technical and skilled talent requires a fundamental combination of industry and education. A framework for evaluating the effectiveness of school facilities was created by author [11]. The service rate and modalities of urban educational facilities were measured in Work [12]. The spatial equality of three different kinds of elementary, middle, and kindergarten-style educational institutions was evaluated by author [13].The spatial distribution of community educational facilities in Palu City was analysed by study [14] using GIS technology in conjunction with the neighbourhood unit technique. There is a deficiency in thorough evaluations because these studies usually concentrate on either usage or management elements, rarely integrating both. Furthermore, prior research has mostly relied on theoretical investigation and literature studies rather than objective and targeted quantitative evaluations, especially when it comes to facility management. China's education system is developing in tandem with the country's social economy, science, and technology advancements. One kind of big data technology that has had a significant impact on education is machine learning. The Internet has made several cutting-edge technologies available for use in field of education. ML algorithm is a kind of artificial intelligence computing that can advance university administration. Chen, higher education must become more sophisticated and varied in the big data era. New technologies are needed to enable data mining and statistics, which will increase management efficiency. The digital economy in Kong is still evolving and changing. National education management must follow a synchronous development pattern in order to be relevant in today's world. Greater success in school administration can be attained in the new platform's machine learning environment. From instructional design to practical simulation and data result analysis, work [15] machine learning courses may better accomplish student happiness and teaching performance, which is beneficial to education management. According to Author [16], new teaching materials and approaches that address the needs of contemporary learners are beneficial for enhancing individual ideological and political construction as well as supporting college administration and advancement. These elements are integral to the political and ideological integration of college instruction. A tailored learning approach implemented in a physics classroom has been shown to enhance student learning [17]. The usage of the online classroom facilitates the procedure. They suggested utilising a machine learning model that has been trained to automatically evaluate lab assignments online. They contended that computers could easily complete the thousands of assignments assigned to numerous teachers in a shorter amount of time than humans could due to physical limitations.

3. Vocational and statistical education analysis in Chongqing Polytechnic college:

A total of 427 students from Chongqing C Vocational College took part in the survey; 372 valid questionnaires were gathered, representing an effective recovery rate of 87.2%, after 55 invalid questions were eliminated. The particular circumstances are as follows: There are 372 effective participants in total for this study, of which 196 are males (52.7%) and 176 are females (47.3%). Regarding the distribution of grades, there are 140 juniors, or 37.7% of the total population, 146 sophomores, or 39.2% of total population, 86 freshmen, or 23.1% of total population. 200 individuals, or 53.8% of total, were from metropolitan regions, while 172 individuals, or 16.2% of the total, were from rural areas. Regarding professional distribution, there are 64 individuals (17.2% of the total) who possess Internet of Things application technology, 62 individuals (16.7% of the total) who possess computer network technology, 61 individuals (16.4% of the total) who possess big data technology, and 62 individuals (16.7% of the total) who possess software technology. Digital media technology is used by 69 people, or 18.5% of the total population. Of those who used artificial intelligence technology, 54 individuals (14.5%) made use of it. Sequence needs to be stable to examine relationship between time series. The regression is referred to as "spurious regression" and all statistical tests will become ineffective if sequence is not consistent since some of statistics of regression parameters will not follow a standard distribution. Because of their extended duration, time series of social and economic variables are frequently non-stable in reality. Therefore, in order to ascertain stationarity and integration order of the series, a stability test should be conducted before building the model with time series variables.

Following an examination of the course title, abstract, content of a subset of classes from Class Central, it is determined that content of OPE is comprised of four elements: knowledge, skills, values, practice content. These elements are categorised in accordance with "planning education content elements." It is evident that primary focus of OPE's communication content is knowledge distribution; conversely, the transmission of skills, values, and even practices is poor or even challenging. The content structure of OPE and conventional planning education (CPE) are contrasted, CPE content structure is chosen from the academic literature that already exists to represent research findings of Chinese and British planning education. The content structure of postgraduate planning education courses in China has been studied by "National Steering Committee of Urban and Rural Planning Education in China" (henceforth referred to as the "NSCURPEC"). Research categorises courses into five groups: "theory courses, method courses, design courses, practice courses and other courses." a comparison of the many components of online and traditional planning instruction. Based on the total number of courses available, the percentage of each course is determined. Due to differing backgrounds, content structure classification of Chinese postgraduate planning education differs slightly from that of "planning education content elements," although both share the same essentials. As such, standards must be harmonised in accordance with the nature of planning education.

4. Students interest data analysis using recurrent long term support vector neural networks (RLTSVNN)

The CPE's content features made use of previously published research data, while the OPE's content data chose most representative planning education courses from a variety of languages and sources offered by the global mainstream MOOCs platform. This selection served as a useful sample for analysing the OPE's content features. A comparative analysis of the relative amounts of each component of the courses' "knowledge, skills, values, and practice" as well as the ways in which class hours are distributed—whether freely or in a defined manner, and how often and for how long—will be conducted. We can comprehend the features of CPE and OPE, weigh the benefits and drawbacks, and develop the best strategy by comparing content characteristics and temporal factors. Simultaneously, the composition of the analysis of OPE course providers may aid in our understanding of the OPE production pattern from a macro standpoint (Figure 1). Massive Open Online Courses (MOOCs) have emerged as a result of the rapid development of online education. With so much material available in the course, learners are unable to make informed decisions.

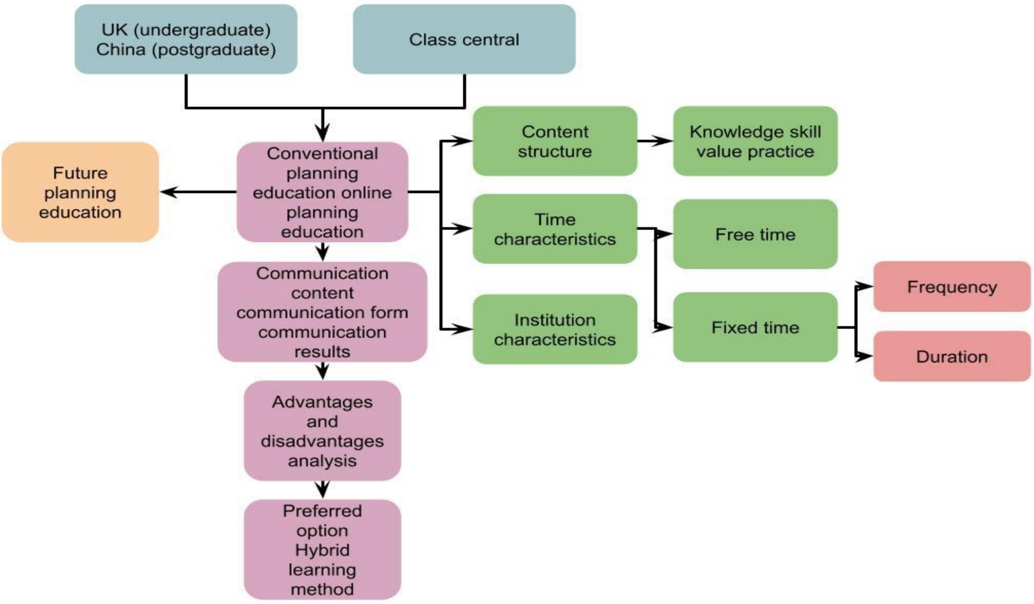


Figure-1 proposed students interest data analysis

We must first define scope of vocational education before we can investigate the connection between it and Chongqing's economic growth. Scope of vocational education in Chongqing is always changing due to its late start time and ongoing development. Vocational education in Chongqing covered secondary specialised schools, technical schools, and vocational middle schools from the city's incorporation until 2004. In 2005 and 2006, it also covered vocational colleges, secondary professional schools, technical schools, and vocational middle schools. Finally, from 2007 to the present, secondary vocational schools and vocational colleges were included in the scope of Chongqing vocational education. These data are arranged in the "Yearbook of Chongqing Education Fund statistics" across all levels and types of educational institutions.

A text classification system receives a document x = {x1, x2,..., xT } as inputs, where T is the document's word length. It then predicts a label y ∈ Y. We contrast generative and discriminative text categorization algorithms. Discriminative models are designed to identify right label from a range of options. These methods are trained to maximise conditional probability of labels given the documents, PN i=1 log p(yi | xi), given a set of labelled documents {(xi, yi)} N i=1. On the other hand, under the following factorization, generative models are trained to maximise joint probability of labels and documents: P(xi, yi) = P(xi | yi)p(yi) = PN i=1 log p(xi, yi). Bayes' rule is used to predictions in order to calculate p(y | x). A word x is represented in both models by a D-dimensional embedding, x ∈ R D. Using LSTM with "peephole" connections, our discriminative model encodes a document. A classifier is then constructed on top of encoder, with average of LSTM hidden representations serving as document representation. To be more precise, we use LSTM to compute the hidden representation (ht) ∈ R E of an input word embedding (xt) in the following way by eqn (1)

$$\mathbf{i}_t = \sigma(\mathbf{W}_i[\mathbf{x}_t; \mathbf{h}_{t-1}; \mathbf{c}_{t-1}] + \mathbf{b}_i)$$

$$\mathbf{f}_t = \sigma\left(\mathbf{W}_f[\mathbf{x}_t; \mathbf{h}_{t-1}; \mathbf{c}_{t-1}] + \mathbf{b}_f\right)$$

$$\mathbf{c}_t = \mathbf{f}_t \odot \mathbf{c}_{t-1} + \mathbf{i}_t \odot \tanh(\mathbf{W}_c[\mathbf{x}_t; \mathbf{h}_{t-1}] + \mathbf{b}_c)$$

$$\mathbf{o}_t = \sigma(\mathbf{W}_o[\mathbf{x}_t; \mathbf{h}_{t-1}; \mathbf{c}_t] + \mathbf{b}_o)$$

$$\mathbf{h}_t = \mathbf{o}_t \odot \tanh(\mathbf{c}_t) \tag{1}$$

where vector concatenation is shown by [u; v]. As our initial tests show that it performs better than utilising the latest hidden state, hT, and is computationally significantly less expensive for lengthy documents than attention-based methods, we employ a simple average of LSTM hidden representations. It's significant to note that this model is discriminatively trained to maximise p(y | x;W, V), which is the conditional probability of the label given the document.

Here, we use LSTM to compute hidden representation ht in a similar manner. A label embedding matrix V ∈ R Ȩ|Y| is also included. Probability p(x | y) is factorised into a sequential prediction using the chain rule as follows: p(x | y) = QT t=1 p(xt | x xt [ht; vy]+by,xt). Because it has some parameters that are shared by all classes, we call this model "Shared LSTM." The novelty of this model stems from the fact that, unlike traditional generative classification models, which include generative n-gram language classification models, each label in this model has an independent LM. For prediction, we use the empirical relative frequency estimate of p(y) to compute yˆ = argmaxy∈Yp(x | y;W, V, U)p(y).

We initially utilise a lookup layer to obtain the vector representation xi of every word xi in text sequence x = {x1, x2, · · ·, xT }. The output at the final moment hT, which consists of a fully connected layer that predicts probability distribution over classes, is representation of entire sequence. The network's parameters are trained to reduce cross-entropy between true as well as forecast distributions by eqn (2)

$$L(\hat{\mathbf{y}}, \mathbf{y}) = -\sum_{i=1}^{N} \sum_{j=1}^{C} \mathbf{y}_i^j \log\left(\hat{\mathbf{y}}_i^j\right) \tag{2}$$

where N represents number of training samples, C is class number, y j i is ground-truth label. Yˆ j i is prediction probabilities. Ultimately, the task-specific representations generated by the multitask architectures mentioned above are fed into various task-specific output layers by eqn (3)

$$\hat{\mathbf{y}}^{(m)} = \operatorname{softmax}\left(\mathbf{W}^{(m)}\mathbf{h}^{(m)} + \mathbf{b}^{(m)}\right) \tag{3}$$

Linear sum of the cost functions for each joint makes up our global cost function by eqn (4)

$$\phi = \sum_{m=1}^{M} \lambda_m L\left(\hat{y}^{(m)}, y^{(m)}\right) \tag{4}$$

where λm represents relevant weights for each task m. The function of updated attention is specified as A, and the function of updated hidden states is defined as H. Wtmp stands for temporarily updated weights following the attention model, whereas W is specified as matrix weights. Initial hidden states are denoted by h, and updated hidden states are denoted by h ∗. The initial output is defined as y, while the modified output is defined as y ∗. Next, a hyperplane with the largest margin of separation across data classes is found in this region by the procedure. It was shown that accuracy of classification usually changes only weakly on the specific projection, provided the target space is sufficiently high dimensional. In this case, size of separating margin and the penalty for each vector inside the margin are traded off. We shall briefly review the basic theory of SVM in following. Separating hyperplane is defined as eqn (5)

$$D(\mathbf{x}) = (\mathbf{w} \cdot \mathbf{x}) + w_0 \tag{5}$$

In this case, w and w0 are hyperplane's parameters that SVM will estimate, x is sample vector that are mapped to a high-dimensional space. After that, the margin can be written as a minimal τ that holds by eqn (6)

$$\frac{y_l D(\mathbf{x_k})}{\|\mathbf{w}\|} \geq \tau \tag{6}$$

We are able to apply the constraint τ||w||) 1 to w without losing generality. In this scenario, finding less function with following constraints becomes the SVM training issue, and maximising τ is identical to minimising ||w|| by eqn (7)

$$\text{minimize } \eta(w) = \frac{1}{2}(w^* w)$$

$$\text{subject to constraints } y_i[(w' x_i) + w_0] \geq 1 \tag{7}$$

Lagrange multipliers are introduced, and the function is minimised, to solve this issue by eqn (8)

$$Q(\mathbf{w}, w_0, \alpha) = \frac{1}{2}(\mathbf{w} \cdot \mathbf{w}) - \sum_{i=1}^{n} \alpha_i \{y[(\mathbf{w} \cdot \mathbf{x}_i) + w_0] - 1\} \tag{8}$$

Ri are Lagrange multipliers in this case. By substituting and differentiating between w and wi, we get by eqn (9)

$$\max Q(\alpha) = \sum_{i=1}^{n} \alpha_i - \frac{1}{2}\sum_{ij=1}^{n} \alpha_i \alpha_j y_j y_j (x_i \cdot x_j)$$

$$\text{subject to constraints } \sum_{i=1}^{n} y_i \alpha_i = 0; \alpha_i \geq 0, i = 1, \ldots, n \quad (9)$$

Slack variables are added for sample vectors that are inside margin when perfect separation is not achievable, optimisation problem is reformulated by eqn (10)

$$\text{minimize } \eta(w) = \frac{1}{2}(w^{\cdot} w) + C \sum_{i} \xi_i$$

$$\text{subject to constraints } y_i[(w \cdot x_i) + w_0] \geq 1 - \xi_i \quad (10)$$

These are the slack variables, êi. Only those vectors within the margin have these variables equal to zero. By using Lagrange multipliers once more, we eventually arrive at eqn (11)

$$\max Q(\alpha) = \sum_{i=1}^{n} \alpha_i - \frac{1}{2}\sum_{ij=1}^{n} \alpha_i \alpha_j y_j y_j (x_i \cdot x_j)$$

$$\text{subject to constraints } \sum_{i=1}^{n} y_i \alpha_i = 0, C \geq \alpha_i \geq 0, i = 1, \ldots, n \quad (11)$$

This is a recognised quadratic programming (QP) issue with several efficient conventional solutions. Due to the extraordinarily huge dimensionality of QP issue, which typically arises during SVM training, an extension of QP problem solving algorithm is used in SVM applications. SVM classification may distinguish between two types of points: support vectors and nonsupport vectors. Outside of the separation margin, nonsupport vectors are correctly classified by the hyperplane. Slack variables and Lagrange multipliers are both equal to zero. They have no effect on the parameters of the hyperplane, and as long as these points remain outside the margin, the margin and the separating hyperplane will remain unchanged, regardless of where they are. For every support vector, the distances between these points and the margin of separation are equal to absolute values of slack variables. These distances are measured in half the width of separating edge. Correctly identified locations have slack variable values between zero and one within separation margin. Values of the slack variable for incorrectly identified points falling between one and two in the margin. For the other improperly classified points, there are more than two. Points near the margin have lagrange multipliers that range from zero to C, but their slack variables stay at zero. Different kernels can be used. In this instance, we employed a fifth-order polynomial's kernel function by eqn (12)

$$K(\mathbf{x}, \mathbf{x}') = \left((\mathbf{x} \cdot \mathbf{x}')s + r\right)^5 \quad (12)$$

This kernel and decision function by eqn (13).

$$f(x) = \text{sign}\left(\sum_i \alpha_i K(x_i^w, x) + b\right) \quad (13)$$

where Ri are the Lagrange multipliers that the SVM is trained upon. The total only includes the support vectors xsV. For every other point, the Lagrange multipliers are 0. The hyperplane's shift is determined by parameter b, which is also discovered during SVM training. The decision function remains unchanged when the s, r, and b parameters are scaled simultaneously. Thus, by setting r to 1, we can simplify the kernel by eqn (14)

$$K(x, x') = \left((x \cdot x')s + 1\right)^5 \quad (14)$$

In this case, the only parameters that need to be changed are the error tradeoff (C) and the kernel parameter (s). Parameter C is not explicitly included in this equation; rather, it is set up as a penalty for misclassification errors committed before SVM training. To adjust parameters s and C, the training data was cross-validated four times. Next, the s and C values that maximised accuracy were chosen. To maximise accuracy, a gradient descent method based on heuristics was employed. Essentially, the procedure that follows was applied. Four nonoverlapping subsets were created from the training set. Reasonable beginning values were assigned to the SVM parameters that needed to be calculated. Subsequently, one of the four subgroups was removed from the training data, and the SVM classifier was trained using the remaining subset to estimate its performance. After repeating this process for every subgroup, the SVM classifier's average performance was determined.

5. Performance analysis:

The information gathered by 1500 education management system as well as associated multi-dimensional feature parameters make up prediction model's data set. Data set is validated and chosen as a (1,900) training data set, (900, 1200) validation set and a (1200, 1500) test set. During the training phase, the Sigmoid optimizer's learning rate is set to 0.001. nonetheless, max_seq_len is set to 128 and batch_size is set to 64. Experimental platform's particular hyperparameters are employed with a value of 0.5 to prevent overfitting issues.

Study area:

Inland China's Chongqing is situated in southwest. China's megacity and provincial administrative region, Chongqing, is a municipality directly under control of national government. As economic heart of Yangtze River's upper reaches, it is a significant national hub for sophisticated manufacturing, a western financial centre, a hub for western international comprehensive transportation, international gateway [33]. It is also one of China's most significant central cities. By end of 2021, it governed 26 districts, 8 counties, and 4 autonomous counties with a combined size of 82,400 square kilometres and 32,12443 million permanent residents. Complete cultural and educational facilities can be found in Chongqing, which also has 20 public art-performance groups, 41 cultural centres, 43 public libraries, 111 museums. Radio has a 99.49 percent comprehensive population coverage rate, while television has a 99.56 percent coverage rate. There are 69 higher education general schools, 3 adult education colleges and universities, 129 secondary vocational schools, 5684 kindergartens, 2717 ordinary primary schools, 39 special education schools. Higher education's gross enrollment rate is 58.03 percent; primary school enrollment is 99.93 percent; three-year preschool enrollment is 91.01 percent; nine-year compulsory education's consideration rate is 95.67 percent. Nonetheless, there are clear distinctions between Chongqing's urban and rural dual economic and social structures, significant regional and urban variations have emerged as a result of development of urban environment.

Table 1 displays the data samples chosen for this part. Sample data pertaining to economic level and industrial structure differs significantly from one another. These include a very small value of 25,311 yuan, a very big value of 134,211 yuan, standard deviation of 38,644 for per capita GDP of school site (C1). At the school site (C2), per capita disposable income ranges from a very small 27,412 yuan to a very big 44,351 yuan, with a standard deviation of 5,311. In terms of school circumstances, there is a significant disparity between building size and volume of library, between income from education funds and entire worth of teaching equipment. There is less of a disparity between the building area as well as book collection. School's 2017 education funding income (C5) has a very little value of 6.34 million yuan, a very high value of 435.11 million yuan, standard deviation of 11241 among them.

Table 1. Sample characteristics

Variable	symbol	Mean value	maximum	minimum	Standard deviation
National GDP per capita	C1	86454	134210	25312	38645
Average disposable income of school	C2	378443	44355	27414	5312
Output value of second production in school	C3	3513	6315	123	2412
Third industrial output of school	C4	5235	6342	168	2936

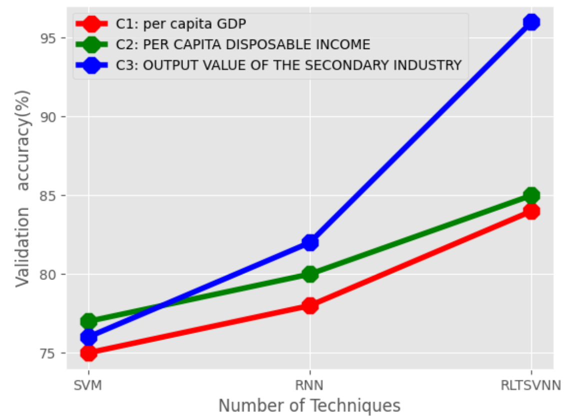
Education revenue in 2017	C5	11244	43512	635	11243
School collection	C6	42	141	-	54
Value of school's teaching instrument	C7	6345	22432	467	4935
School building area	C8	34	78	-	19
Number of teachers in school	C9	355	868	45	215
Double division" in school	C10	189	626	5	175
School enrollment	C11	7845	22432	662	5315
Efficiency of higher vocational colleges	C12	1.2358	5.0257	0.3175	0.8425

Factor analysis can be performed since the correlation matrix's high correlation coefficients show that the influencing factors have a strong correlation with one another. C1: local GDP per capita of school. C2: The location of school's per capita disposable income. C3: Secondary industry's output value in school's location. C4: tertiary sector's output value at school site. C5: Amount of education funding received by the school in 2017. C6: The school's book library. C7: The total cost of the teaching tools and supplies owned by the school. C8: Floor area in schools. C9: The total count of school's full-time teachers. C10: Number of "dual-teacher" instructors at institution. C11: total number of pupils enrolled. C12: effectiveness of school's use of its educational budget. C10: how many "dual-teacher" instructors work at institution. C11: The total student population of school. C12: effectiveness of educational budget allocated by school. Examination of Table 4 reveals a high correlation coefficient in correlation matrix, signifying a robust association among the several contributing elements that can be examined using factor analysis. The primary factors are extracted using the principal component analysis approach; principal factors with eigenvalues larger than 1 are often selected. Major factor's impact on the initial variable grows as the eigenvalue.

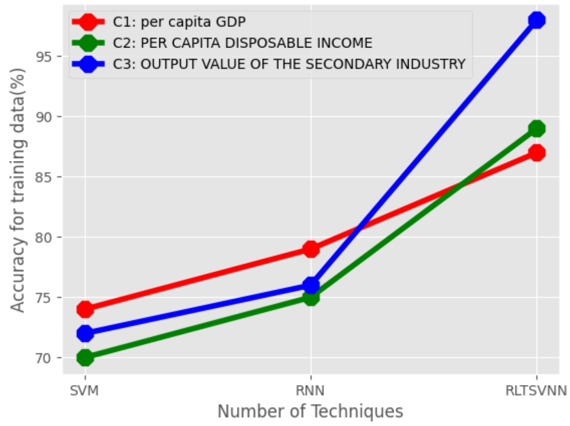
Table- 2 Comparative based on various correlation coefficients of input dataset

Dataset	**Techniques**	**Validation accuracy**	**Accuracy for training data**	**F-measure**	**Precision**	**Recall**
C1: per capita GDP	**SVM**	75	74	69	73	77
	RNN	78	79	73	77	82
	RLTSVNN	84	87	78	82	85
C2: PER CAPITA DISPOSABLE INCOME	**SVM**	77	70	73	72	75
	RNN	80	75	76	75	81
	RLTSVNN	85	89	84	80	86
C3: OUTPUT VALUE OF THE SECONDARY INDUSTRY	**SVM**	76	72	76	72	78
	RNN	82	76	80	79	85
	RLTSVNN	96	98	87	88	92

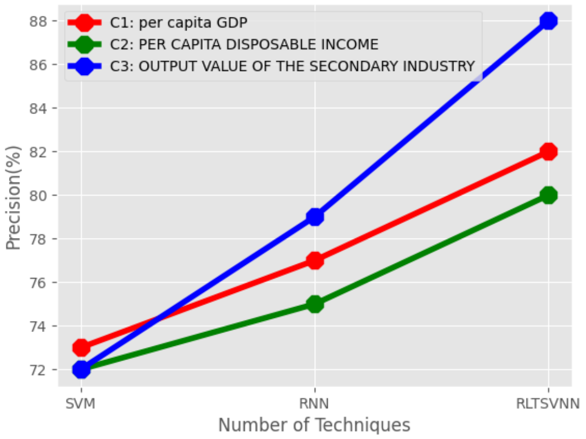
Table-2 shows comparative for various multi-modal watermarked image dataset. Here the proposed technique analysed for C1: per capita GDP, C2: PER CAPITA DISPOSABLE INCOME, C3: OUTPUT VALUE OF SECONDARY INDUSTRY OF SCHOOL LOCATION multi-modal watermarked image dataset. Parametric analysis has been carried out in terms of Validation accuracy, Accuracy for training data, precision, RECALL, F-MEASURE.



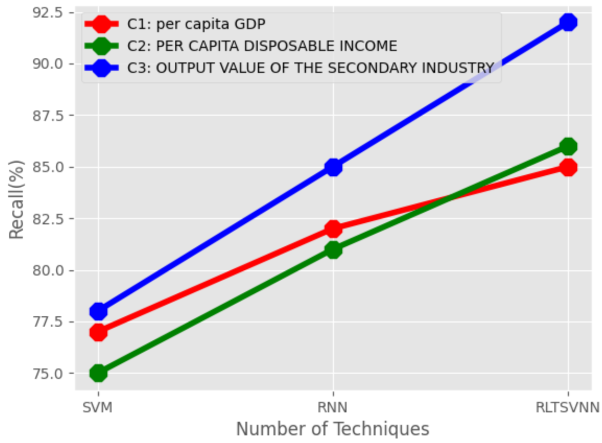
(a) Validation accuracy



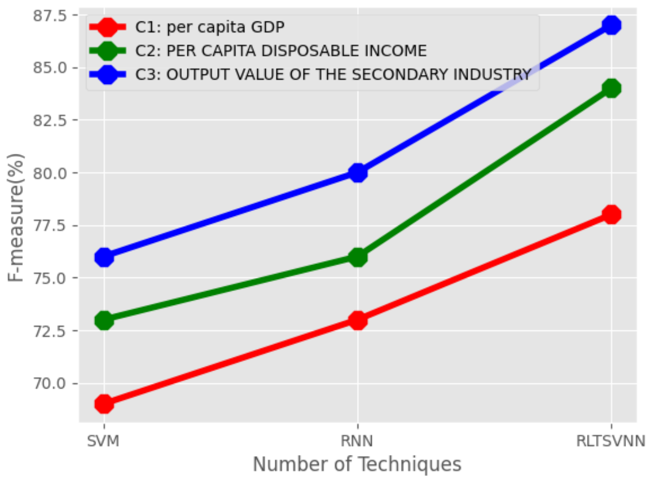
(b) Accuracy for training data



(c) Precision



(d) RECALL



(e) F-MEASURE

Figure-2 Comparative for multi-modal watermarked image dataset in terms of (a) Validation accuracy, (b) Accuracy for training data , (c) Precision, (d) RECALL, (e) F-MEASURE

Figure 2 (a)- (e) shows comparative analysis for multi-modal watermarked image dataset. Here the proposed technique Validation accuracy of 84%, Accuracy for training data of 87%, Precision 82%, RECALL 85%, F-MEASURE 78%. While existing SVM attained Validation accuracy 75%, Accuracy for training data 74%, Precision 73%, RECALL of 77%, F-MEASURE of 69%; RNN attained Validation accuracy of 78%, Accuracy for training data of 79%, Precision of 77%, RECALL of 82%, F-MEASURE of 73% for C1: per capita GDP dataset. the proposed technique obtained 85% of Validation accuracy, 89% of Accuracy for training data , 80% of Precision, 86% of RECALL, 84% of F-MEASURE. existing SVM attained Validation accuracy of 77%, Accuracy for training data of 70%, Precision of 72%, RECALL of 75%, F-MEASURE of 73%; RNN attained

Validation accuracy of 80%, Accuracy for training data of 75%, Precision of 75%, RECALL of 81%, F-MEASURE of 76% for *C2: PER CAPITA DISPOSABLE INCOME* dataset. For C3: OUTPUT VALUE OF THE SECONDARY INDUSTRY OF THE SCHOOL LOCATION dataset proposed technique obtained 96% of Validation accuracy, 98% of Accuracy for training data , 88% Precision, 92% of RECALL, 87% of F-MEASURE. existing SVM attained Validation accuracy 76%, Accuracy for training data 72%, Precision 72%, RECALL 78%, F-MEASURE 76%; RNN attained Validation accuracy 82%, Accuracy for training data of 76%, Precision of 79%, RECALL of 85%, F-MEASURE of 76%.

6. Conclusion:

Based on data analysis utilising machine learning techniques, this study proposes fresh techniques in vocational and statistical education analysis at Chongqing Polytechnic College. Here, recurrent long-term support vector neural networks have been used to gather and assess interest data from students based on the vocational and statistical education systems. The quality of the training samples is just as important to this method's prediction accuracy as their quantity in terms of scientific validity. The prediction of college students' deep learning level is more accurate and of higher quality when there are more training examples available. High prediction accuracy and quick learning speed are two features of the deep learning management prediction model for vocational education that this paper constructs. With the help of this prediction model, instructors may more easily assess their own teaching methods and help college students understand their learning environment on time. Additionally, it can offer scientific direction for reforming education in schools. Machine learning and school management systems will combine to form a significant new educational trend. Create a comprehensive network education management system first, starting with overall method, detailed system design, and database design. This should be built on B/S architecture. Among these, the management of the educational system and network teaching are realised using computer language in conjunction with SQL Server database.

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