Research Article

Professional Talent Training System for Landscape Engineering Based on K-Means Algorithm

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As the economy and society are developing and changing continuously, the garden industry is also developing and changing. The landscape industry has become a major focus of research on how to bring the training methods of the landscape technology profession more in line with the changing times, and how to make the training methods more in line with the needs of the industry by using modern personnel training methods. And it is important to find a good k-means algorithm to match the development of landscape engineering professionals. In this experiment, a combination of telephone interviews and questionnaires was used to ask questions about the landscape engineering profession. The respondents were the principals of the enterprise or relevant technical personnel. They learned what abilities the landscape engineering professionals needed by the society should have, and then the components were appropriate. The teaching system is used to conduct experimental teaching for landscape engineering majors, and there is also a landscape engineering professional control group for comparative analysis. The experimental results show that 27.45% of the students in the experimental group have 60–70 credits, while only 10.34% of the students in the control group have credits in this interval. The gap between the students in the two classes is very large, mainly because the experimental group pays attention to the combination of practice; practice and theory can better promote students’ mastery and application of professional knowledge. Moreover, 66.67% of the students in this experimental group found jobs in their majors. It can be seen from this that this system of cultivating talents for landscape engineering is very useful.

1. Introduction

In today’s society, issues such as environmental protection and health have become hot topics of widespread concern to all mankind, and living in harmony with nature and promoting the sustainable development of human society have become the common aspiration of people all over the world. Attaching great importance to landscaping, making every effort to enhance the human landscape, and creating a liveable city is an objective need for economic and social construction and an inevitable choice for the construction of civilization. Moreover, there is not much research on the reform of teaching and training of landscape engineering professionals, and most of the existing studies have been discussed from the perspective of the setting of a certain professional curriculum or innovation. This study attempts to provide solid theoretical support for better research on talent-training teaching reform strategies through the collation and analysis of literature related to landscape engineering professional teaching reform, and data analysis and summary through actual research.

In order to cultivate talents in landscape engineering more efficiently, some researchers have studied the talent cultivation system and related methods, among which Zhang studied the exploration and practice of cultivating excellent engineers in safety engineering at Longdong University, and comprehensively strengthened the construction of a comprehensive curriculum for students according to the excellent engineer cultivation plan [1]. Hua studied the quality cultivation system of engineering combination talents in higher vocational colleges. The research and practice of the construction of the guarantee system of the combination of engineering in higher vocational colleges and universities fully elaborated on the impact of school-
enterprise cooperation and the practicality of the combination of engineering [2]. Zhou and Si discussed the problems existing in the current ideological and political education of vocational courses and explored the role of the path of ideological and political education of vocational courses in the cultivation of talents in judicial vocational education [3]. Li studied the “three-to-three system” and “talent training model” and applied it to the reform of education [4] but they did not find a good algorithm to apply to the talent training system.

Therefore, in order to find an optimization algorithm, many scholars have studied the K-means algorithm and the optimization algorithm, among which Yang et al. proposed a hybrid distance-based initialization method for the K-means algorithm based on the number of neighbouring points and the distance between points and neighbouring points to redefine the density of points [5]. Xiao-Yu et al. proposed an improved parallel Hadoop-based K-means algorithm, combined with a distributed computing model, and gave a parallel implementation method and strategy for the improved algorithm [6]. Fa Bregas et al. studied the enhanced initial prime of the K-means algorithm, and then compared the K-means and enhanced K-means algorithms [7]. Jing and Wang improved the traditional K-means clustering algorithm into the MMSK-means clustering algorithm [8]. Kader et al. studied a fuzzy K-means algorithm for forming digital image feature fragments using a fractal model and proposed a method for detecting nonfeatured blocks of images based on self-similar fractal feature analysis [9]. However, there are still some shortcomings in the methods they studied.

This paper analyses society’s demand for the competencies of landscape engineering professionals through a questionnaire survey, then constructs a curriculum system based on the survey, and then conducts experiments through experimental and control groups. The innovation of this paper is that it inquires from a large number of surveys and data about the demand of society for landscape engineering majors, then gives the relevant course settings and credits, and then analyses the advantages of the method through controlled experiments, as well as this article compares the total credits of these students, and also surveys and summarizes their direction in graduation.

2. K-Means Algorithm and Related Techniques

2.1. Data Mining. The result of data mining, that is, the discovered knowledge must be of value to people and of interest to users [10]. The knowledge data discovered must be acceptable, understandable, or useable, the knowledge discovered is also accessible to people. Therefore, there are applications of data mining in many fields, as shown in Figure 1.

Among them, there are many classical algorithms in data mining, which play a very important role in the development of the field of data mining. Data mining is an advanced decision support process, including machine learning pattern recognition, visualization technology, artificial intelligence technology, statistical theory, and data warehouse technology. These algorithms are applied and the common classical algorithms are shown in Figure 2.

The method used in this paper is an algorithm in the clustering approach. Unlike data mining classification algorithms that train a model that can accurately classify unknown samples based on data samples with labelled information, the information of the training samples for clustering algorithms is unknown. The main goal of cluster analysis is to classify unlabelled data objects in a dataset into corresponding classes, called class clusters [11, 12]. Its process is shown in Figure 3.

Feature extraction in Figure 3 refers to the need to select appropriate feature values and assign higher weights to the information that needs to be of interest. And for unimportant features, give lower weights, and you can also propose them by setting a certain threshold to increase the sensitivity to outliers [13]. However, the clustering algorithm process is the specific method, there are, at present, many types of clustering algorithms. For different input types, different clustering purposes, and different application environments, the appropriate clustering algorithm must be selected. In fact, many clustering algorithms are similar. In a broad sense, the development process of clustering algorithms can be divided into two categories: traditional clustering algorithms and newly developed clustering algorithms [14].

A good cluster analysis clustering division method should enable division by clustering. Depending on the different ways in which class clusters are formed when the algorithm performs the clustering task, clustering algorithms can be divided into four different categories, as shown in Table 1.

The division-based clustering algorithm in Table 1 is the first and most widely used class of clustering algorithms. An effective division-based clustering algorithm should make the new clustering result after each iteration of the algorithm is executed closer to the true division of the dataset than the previous clustering result. Partition-based clustering algorithms first determine an initial clustering result, and then partition the data object attribution in the dataset by a specified similarity metric [15].

Hierarchical clustering algorithms can be divided into cohesive hierarchical clustering algorithms and split hierarchical clustering algorithms, depending on the dataset partitioning strategy. The cohesive hierarchical clustering
algorithm uses a bottom-up aggregation strategy, each data object in the dataset is regarded as an initial cluster, and the most similar clusters are gradually merged during the execution of the algorithm to obtain the final clustering result, whereas the split hierarchical clustering algorithm uses a top-down division strategy until the end conditions of the algorithm are met [16]. This is shown in Figure 4.

Density-based clustering algorithms treat the entire dataset as a data space and the clusters formed by each element class in the dataset as dense regions separated by sparse regions. Density-based clustering algorithm preferentially selects high-density data objects as core objects; after all data objects are classified into a certain cluster or marked as outliers, the algorithm stops iterating. This centre-based density approach allows points to be classified as core, boundary, and noise points [17]. kfl_his is shown in Figure 5.

Point A in Figure 5 is a core point; if the number of data points in the neighbourhood of a given point exceeds a predetermined reading value then that point is a core point; point B is a boundary point; and point C is a noise point.

Unlike other clustering algorithms that act directly on the data objects in a dataset, grid-based clustering algorithms first partition the data space in which the dataset resides. Divide the data space into a finite number of space units, and then perform information statistics on the data objects in each space unit.

There are two main types of similarity measures commonly used in cluster analysis, namely, distance measures and similarity measures. The distance measure uses the distance between data objects as the similarity measure of data objects [18]. For two data objects \( x = \{x_1, x_2, \ldots, x_m\} \) and \( y = \{y_1, y_2, \ldots, y_m\} \) containing \( m \) attributes, if the data objects \( m \) attributes are continuous data, the distance between the data objects \( x \) and \( y \) is \( d(x, y) \) and the distance measure between the two data objects usually has the following forms:

- **European distance.**
  \[
  d(x, y) = \sqrt{\sum_{i=1}^{m} (x_i - y_i)^2}.
  \]

- **Manhattan distance.**
  \[
  d(x, y) = \sum_{i=1}^{m} |x_i - y_i|.
  \]

- **Chebyshev distance.**
  \[
  d(x, y) = \max_i |x_i - y_i|.
  \]

If all the attributes of the data object \( m \) are discrete data, the distance between the data objects \( x \) and \( y \) is \( d(x, y) \). The distance between discrete data is usually expressed as the Hamming distance:

- **Hamming distance.**
  \[
  d(x, y) = \sum x_i \oplus y_i.
  \]

Similarity measures treat data objects as a set of vectors in Euclidean space, and the degree of similarity between data objects is evaluated by the similarity of the directions between the vectors. For two data objects \( x = \{x_1, x_2, \ldots, x_m\} \) and \( y = \{y_1, y_2, \ldots, y_m\} \), containing \( m \) attributes, the distance measure between the two data objects is usually of the following form:

- **Cosine similarity:** when evaluating the similarity of data objects using cosine similarity, the similarity between data objects is evaluated by the similarity of the directions between the vectors they represent:
  \[
  \cos(x, y) = \frac{\sum_{i=1}^{m} x_i y_i}{\sqrt{\sum_{i=1}^{m} x_i^2} \sqrt{\sum_{i=1}^{m} y_i^2}}.
  \]

The Pearson correlation coefficient is obtained by normalizing the cosine similarity:

- **Correlation.**
  \[
  \rho(x, y) = \frac{\sum_{i=1}^{m} (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{m} (x_i - \bar{x})^2} \sqrt{\sum_{i=1}^{m} (y_i - \bar{y})^2}}.
  \]

The data object similarity measure ranges from \(-1\) to 1. For two data objects, the closer the similarity measure is to 1, the higher the similarity between the data objects.

2.2. **K-Means Algorithm.** The k-means algorithm is simple and highly efficient and is now widely used. K-means algorithm requires the user to input parameters \( K \) in advance, and the algorithm will randomly select \( K \) points as the initial centroids, then divide the other points in the sample into the nearest clusters according to the calculation formula, and then calculate the average of all objects in the cluster as the new centroids [19]. Iteration is repeated until the objective function converges. During each iteration, the algorithm will calculate whether the sample point is allocated to the nearest cluster centre. If the allocation is wrong, it needs to be
adjusted to the corresponding cluster centre, otherwise, no adjustment is required. Its process is shown in Figure 6.

The process of finding the cluster centres for the five data points can be seen in Figure 6. The operation of the K-means algorithm can be seen through this simple process: (1) Randomly take two initial data points in the graph, which are the grey points in the graph. (2) Calculate the remaining points and their distances. In the graph, the five points can be seen to fall into two distinct categories. (3) Recalculate the mean points, slowly find the centre of the “cluster family,” and then calculate whether the objective function converges. (4) Repeat steps 2 and 3 until the seed points no longer move.

During the execution of the algorithm for K-means, it requires the input of the dataset and the number of points in the dataset, the K-value, in advance; and if the initial centres are not specified, then the initial test centres are selected randomly. If the points selected are in the same category or are isolated, different clustering results will occur [20].

The K-means algorithm proceeds as follows: first, among the \( N \) data objects, \( K \) objects are randomly selected as the initial cluster centres, and the rest of the data are assigned to the nearest cluster centres according to their similarity; next, the mean value of each cluster is calculated as the new centre of the cluster and the process is repeated until the standard metric function converges.

In the Euclidean space \( R^n \), the dataset \( D \) contains \( n \) data objects: \( D = \{ x_1, x_2, \ldots, x_m \} \), and each data object contains \( m \) attributes: \( x_i = \{ x_{i1}, x_{i2}, \ldots, x_{im} \} \). The clustering algorithm divides the dataset \( D \) into \( k \) clusters of classes that are independent of each other: \( C = \{ C_1, C_2, \ldots, C_k \} \) and the centroid of each class family is \( v_i \) and the global centroid of the dataset \( D \) is \( v \). The number of data objects contained in the class cluster \( C_i \) is \( |C_i| \). The Euclidean distance between the data objects \( x_i = \{ x_{i1}, x_{i2}, \ldots, x_{im} \} \) and \( x_j = \{ x_{j1}, x_{j2}, \ldots, x_{jm} \} \) is given by:

\[
 d(x_i, x_j) = \sqrt{(x_{i1} - x_{j1})^2 + \ldots + (x_{im} - x_{jm})^2}.
\]

The COP indicator is defined as:

\[
 \text{COP}(i) = \frac{1}{2} \sum_{C \in \mathcal{C}} \frac{(1/n_i) \sum_{x \in C_i} d(x_i, v_i)}{\min_{x \in C_i} \max_{x \in C_i} d(x_i, x_j)}
\]

The COP metric measures the intraclass tightness of a class cluster in terms of the average distance from data objects within the class cluster to the class cluster centroid, and the intercluster separation of a class cluster in terms of the minimum of the maximum distance from data objects
within the cluster to data objects within other class clusters. The COP index is a minimum value index, that is, the clustering algorithm has the best division effect when the index achieves the minimum value [21].

CSP indicators are defined as:

\[
\text{CSP}(i) = \frac{(sd(i) - cd(i))}{(sd(i) + cd(i))}.
\]

Of which

\[
sd(i) = \min_{i \neq j \neq i} \left\{ \min \{d(x_i, x_j) \mid x_i \in C_i, x_j \in C_j \} \right\},
\]

\[
\text{cd}(i) = \frac{W(C_i)}{n_i - 1}.
\]

The average CSP indicator value is defined as:

\[
\text{avg CSP}(k) = \frac{1}{k} \sum_{i=1}^{k} \text{CSP}(i).
\]

Among them: \(W(C_i)\) is the sum of the weights of the minimum spanning tree of the data objects of the \(i\)-th class cluster, the interclass separation of the \(i\)-th class cluster \(sd(i)\) is the minimum value of the minimum distance from the data objects in the class cluster to the data objects in the other class clusters, and the intraclass tightness of the \(i\)-th class cluster \(cd(i)\) is the average weight of the minimum spanning tree of the data objects of the class clusters. The CSP index is a maximal value index, that is, the clustering algorithm has the best division effect when the average CSP index value reaches the maximum value.

The DBI indicator is defined as:

\[
\text{DBI}(k) = \frac{1}{k} \sum_{i=1}^{k} \max \left\{ \frac{\text{avg}(C_i) + \text{avg}(C_j)}{\delta(C_i, C_j)} \right\}.
\]

Among them: \(\text{avg}(C_i) = 1/|C_i| \sum_{x \in C_i} d(x, v_i)\), the average Euclidean distance between the data objects contained in the class cluster \(C_i\) and the cluster centroid, and \(\delta(C_i, C_j) = d(v_i, v_j)\), the Euclidean distance between the class cluster \(C_i\) and the cluster centroid of the class cluster \(C_j\). The DBI metric evaluates the clustering effect as the maximum value of the ratio of the sum of the average Euclidean distances between the data objects within any two class clusters and the Euclidean distance between the cluster centroids of the corresponding class clusters. The DBI index is a minimum value index, that is, the clustering algorithm has the best division effect when the index achieves the minimum value.

The DI indicator is defined as:

\[
\text{DI}(k) = \min_{1 \leq i \leq k} \left\{ \min_{1 \leq j \leq k, j \neq i} \left\{ \frac{D(C_i, C_j)}{\max \delta(C_i)} \right\} \right\}.
\]

Among them \(D(C_i, C_j) = \min_{x \in C_i, y \in C_j} d(x, y)\), the minimum value of the Euclidean distance between data objects within two different class clusters, and \(\delta(C_i) = \max_{x \in C_i, y \in C_i, x \neq y} d(x, y)\), the maximum value of the Euclidean distance between data objects within the same class cluster. The DI index is a maximal value index, that is, the clustering algorithm has the best division effect when the index reaches the maximum value.
The \( I \) indicator is defined as:

\[
I (k) = \left( \frac{1}{k} \times \frac{E_k}{k} \times \max_{i,j=1,\ldots,k} d (v_i, d_j) \right)^p .
\] (15)

Among them, \( E_k = \sum_{i=1}^k \sum_{j=1}^n d (x_j, v_i) \), \( p \) are artificially set arbitrary real numbers not less than 1. \( I \) indicators consist of three factors that compete with and balance each other. The \( I \) index is a maximum value index, that is, the clustering algorithm has the best division effect when the index reaches the maximum value.

The external validity metric assesses the quality of clustering and the performance of the clustering algorithm by comparing the results of the clustering algorithm partitioning with the true classification information of the data objects in the dataset [22]. The true partition of dataset \( D \) in the Euclidean space is \( R^n \), \( P = \{ P_1, P_2, \ldots, P_n \} \). For a set of data objects \( x_i \) and \( x_j \) present in the dataset \( D \), the number of pairs of data objects belonging to the same class cluster is \( a \); the number of pairs of data objects with one class cluster in \( C \) and one class cluster not in \( P \) is \( b \); the number of data objects with one class cluster not in \( C \) and one class cluster in \( P \) is \( c \); and the number of data objects not belonging to the same class cluster is \( d \). \( M \) is the number of pairs of data objects that may occur in \( D \). Then, we have:

\[
M = a + b + c + d , \tag{16}
\]

\[
Purity index: \quad purity = \frac{k}{n} \sum_{i=1}^k \max \left( \frac{m_{ij}}{m_i} \right) , \tag{18}
\]

where \( m_i \) is the number of all data objects in class cluster \( i \), \( m_{ij} \) is the number of data objects in class cluster \( i \) that belongs to the same class \( j \) in the true division \( P \) of the dataset, and \( m \) is the number of members involved in the overall clustering division.

Rand Index:

\[
\text{Rand} = \frac{(a + b)}{M} . \tag{19}
\]

Jaccard coefficient:

\[
\text{Jaccard} = \frac{a}{(a + b + c)} . \tag{20}
\]

3. Talent Training System for Landscape Engineering Professionals

3.1. Cultivation of Professional Talents in Landscape Engineering

Gardening can refer on the one hand to the discipline, namely, horticulture, and on the other hand to specific gardens. When referring to the discipline, it is called horticulture and refers to the science and art of culturally embedded and sustainable human habitat [23]. When referring to a specific garden, it is a green unity created within a certain area, using materials such as landscapes, plants, and animals, according to functional requirements and artistic layout. Table 2 shows the market space for the Chinese garden industry from 2016 to 2021.

The goal of talent training is the standard that the talents to be cultivated must meet, that is, the knowledge and abilities that students are expected to be cultivated into. Specifically, the training goal is to point out the goal that the school expects to achieve by cultivating talents and the knowledge and ability needed to achieve this goal [24]. As part of the implementation of the training programme in the education system, the training objectives have an important significance in guiding the implementation of other aspects of the training programme.

The term “talent” usually refers to people who have general and specialised intellectual talents, who are able to work creatively, and who can make a real contribution to society. On the basis of these common characteristics, talents in different fields have their own evaluation criteria and characteristics. In other words, people who are able to use their general knowledge and scientific and technical knowledge to transform an objectively existing entity into a specific product with some practical value and make a practical contribution to society [25].

As a subdiscipline of engineering with forests as its main object, the concept of “landscape engineering” can be defined as the research and development of products, practices, and engineering techniques that are useful to human society by using knowledge of forests and transforming them. In recent years, with the increasing value of renewable forest resources, the object of garden engineering is not only limited to natural objects such as forests, timber, soil, and rocks but also includes artificial constructions such as roads, houses, bridges, and dams in forest areas. Forest products such as timber, medicinal materials, and foodstuffs, as well as constructing sand control projects, soil and water conservation projects, and civil construction projects in forest areas; giving real feedback on the supply of resources and meeting social needs; actively and reasonably developing and utilizing forest resources; as well as sustainably building and protecting them.

A combination of telephone interviews and questionnaires was chosen before this experiment to ask questions about the landscape engineering profession. The target of the survey was the main person in charge of the enterprise or relevant technical personnel, and 30 questionnaires were distributed to 30 enterprises in the course of the research, of which 30 were recovered. By analysing the recovered data, it is possible to know the overall ability of the talents required by the company, and the results are shown in Figure 7.

Figure 7(a) shows the competencies required of designers in landscape enterprises, while Figure 7(b) shows the competencies required of marketing and business personnel in landscape enterprises. As can be seen from Figure 7(a), the basic requirements for designers in all landscaping businesses include mastery and proficiency in drawing software and familiarity with garden plant habits, which requires schools to set up appropriate foundation courses for these two competencies. For recent graduates, schools need...
professional teachers to lead students more often into construction projects in landscaping to compensate for their lack of experience.

Figure 7(b) shows that there are two basic competencies for marketing personnel: the ability to bid and the ability to communicate, so these professional derivatives should not be overlooked in the curriculum. At the same time, enterprises require market business personnel to understand the distribution of various qualification levels of landscape enterprises, which is the enterprise requirements of business personnel to understand the specific circumstances of the industry, not simply apply the theoretical knowledge of the book, but also need to master the overall situation of the industry. Of course, the basic knowledge of the landscape profession is also essential, so the school’s training of landscape professionals should be integrated and based on the characteristics of students, to carry out the relevant professional elective courses, giving students more professional learning options.

3.2. Design of the Incubation System. In what way is the curriculum structured? The subject-based curriculum is vertically linked according to a progression of knowledge. Practical courses are designed to verify the correctness of theoretical knowledge and are therefore often taught in a predominantly theoretical manner. It is clear that schools do not aim to produce theoreticians in various disciplines, but rather advanced industrial workers who can perform practical tasks. Therefore, the school curriculum should be structured in such a way that it is able to perform the practical operations of a particular job. The school curriculum should be oriented towards the unfolding of the job work content and strung together in a progressive relationship of tasks, with course titles as distinct as possible from the wood subjects. The curriculum reform and the construction of the curriculum resource base provide the guarantee for the construction of the curriculum system. The system design for this training will therefore be set in accordance with the above and the curriculum is shown in Table 3.

Teaching curriculum design requires appropriate personnel training programs, curriculum standards, school-enterprise cooperation, textbook compilation, and practical teaching environment. The adaptation of teaching methods must highlight their flexibility. Unfortunately, in the current schooling context, the state pushes the two ends of the school—enrolment and employment—to the market, but has a firm grip on the teaching and learning operation of the school. Therefore, there are limits to any so-called flexibility in teaching and learning reform. The most effective teaching method for schooling is “practice.” However, state-run schools cannot do what private schools can do, so the only way to do this is to arrange as much practical content as possible within the prescribed academic programme, with all specialized courses completed in the training room or onsite.

3.3. Experiments and Analysis. Combining all the survey data resulted in the development of an instructional development programme, as shown in Figure 8.

Figure 8 shows the general requirements of the college’s teaching management office in developing the talent training programme according to the relevant policies of the higher
The college’s employment department provides the results of graduate satisfaction and enterprise satisfaction surveys. The employment departments combine their own survey results to provide information on the matching employment rate, the degree of job competence fit, and the new talent requirements of enterprises. The Professional Development Committee is not only an important source of information but also an important information processing body. The main body of education is the student, and the educational ideology of teaching to the student’s ability should always be followed, so information on the status of student sources is vital to the development of talent training programmes. The admissions department provides all the information about the student population. In addition, the subjective wishes of the students regarding the curriculum of their specialization are an important factor that cannot be ignored.

The curriculum was applied to a landscape engineering class with 51 individuals, while another landscape engineering control group class used the same curriculum as before, but with 58 individuals in that class. The differences in the landscape engineering courses between these two classes were not significant, but the experimental group focused more on practical hands-on skills, while the control group’s curriculum was set more towards theory. The total number of credits is the same for both courses, where both classes include those three core courses. And credits are given based on scores, with the results shown in Figure 9.

From Figure 9(a), we can see that the two classes have the largest proportion of students with credits between 50 and 60, and both have a similar proportion of students in this mark range, while the experimental group has 27.45% of students between 60 and 70 credits, while the control group has only 10.34% of students with credits in this

### Table 3: Course design.

<table>
<thead>
<tr>
<th>Course nature</th>
<th>Course title</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required courses</td>
<td>Garden engineering technology</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Plant landscaping design</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Garden measurement in kind</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Garden mapping and recognition</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Garden planning and design</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Plants and plant physiology</td>
<td>8</td>
</tr>
<tr>
<td>Core</td>
<td>Garden plant maintenance technology</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Garden tree recognition technology</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Garden arboriculture technology</td>
<td>4</td>
</tr>
<tr>
<td>Professional course</td>
<td>Garden plant pest control technology 1</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Garden-field production technology</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Garden plant growth environment</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Garden plant pest control technology II</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Facility cultivation technology</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Landscape photography techniques</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Garden art</td>
<td>2</td>
</tr>
<tr>
<td>Core</td>
<td>Comprehensive training in construction line</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Comprehensive training in lawn mowing</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Comprehensive training in tree pruning</td>
<td>2</td>
</tr>
</tbody>
</table>

![Figure 8: Flowchart for the development of teaching talent training programmes.](image-url)
range, we can see that the gap between the two classes is still large, mainly because the experimental group focused on practice, and the combination of practice and theory could better promote students’ mastery and application of professional knowledge. From Figure 9(b), we can see that the number of students in the experimental group who found jobs in their major was still high, accounting for 66.67%, while half of the students in the control group found jobs in non-majors. It can be seen that this curriculum for cultivating professional talents in landscape engineering is very useful.

3.4. Recommendations. Continue to adhere to the schooling idea of promoting professionalism by disciplines and quality by educational reform, actively explore the new form of training talents under the new situation by combining teaching, scientific research and production, actively explore and constantly improve the new mode of training talents, and explore the new mode of classifying and training talents in landscape engineering. Continue to strengthen professional research work, further revise and improve the undergraduate talent training programme, and design the knowledge structure of students in accordance with the requirements of social, economic, and technological development. Determine the curriculum system according to the requirements of students’ knowledge structure, revise the training plan, and focus on the cultivation of students’ innovative spirit and entrepreneurial ability. Strengthen the construction of teaching materials and increase the reform of teaching contents and methods.

Further strengthen the construction of infrastructure in the talent training guarantee system. To increase investment in the construction of laboratories and internship bases, integrate laboratory resources, study the form of laboratory opening management, and explore the management of off-campus internship bases together, with emphasis on solving common problems such as insufficient conditions of on-campus internship bases and the ability of experimental materials to be solved. We should start with system research and use the system to guide and encourage teachers to actively engage in teaching activities.

4. Conclusions

In this paper, the comprehensive ability demand of some Chinese enterprises for talents in landscape engineering is investigated and analysed by means of questionnaires, and
then the curriculum system is constructed according to the investigation so that students can be more in line with the society's technical needs for this professional talent. And then through the experimental group and the control group, the total credits of the two courses are the same, but the experimental group is the course after optimization, which mainly focuses on the practical operation ability of students. The experimental group is an optimized course, which mainly focuses on the practical skills of the students, and can make the students more in line with the abilities that the landscape engineering profession should have. However, the experimental part of this paper still has some shortcomings; the experimental value is for two classes, the experimental control will have some errors, the experimental part can be further optimized, but the experimental data of this experiment is still very convincing. The experimental data of this experiment are still very convincing. And with the development of society, the system of training talents for landscape engineering will be further improved.

Data Availability

This article does not cover data research. No data were used to support this study.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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