Study on the Alignment Between Talent Training Directions and Employment Market Demands in the Landscape Architecture Industry

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Abstract: Currently, talent training in Chinese universities for landscape architecture is mainly divided into three directions: "landscape planning and design," "landscape construction management," and "landscape plant planting and maintenance." However, with the background of the slowing urbanization process and the widespread demand for composite talents in society, it remains to be verified whether the traditional three major talent training directions in landscape architecture align with the job demands in the current construction market. Based on a survey and analysis of over 300 industry practitioners, this study found a clear trend of merging the three major employment directions into "landscape design and construction" and "landscape plant planting and maintenance." This presents new requirements and directions for the skill training of landscape architecture majors in universities and provides insights into the alignment between talent training and employment demands in other industries.

Keywords: Landscape architecture profession; Professional skills; Employer demands; Integration of industry and education

1. Research background

In March 2022, the Chinese Ministry of Human Resources and Social Security issued the "Notice on Strengthening Enterprise Recruitment Services," requiring the clarification of urgently needed and scarce occupations, as well as enhancing guidance for enterprise employment, to scientifically set up positions and formulate recruitment plans [1]. The development of the current era continuously puts forward new requirements for talent skills, necessitating universities to fully investigate employer demands and clarify job scenarios and professional skill requirements during talent training. In the field of landscape architecture in higher education institutions, there are generally three talent training directions: "landscape planning and design," "landscape construction management," and "landscape plant planting and maintenance." In the current market where small and medium-sized enterprises and small-scale landscaping projects dominate, it is necessary to further explore whether this employment direction division and curriculum system construction still meet the actual

professional skill requirements in work.

1.1. Professional skills

According to the CareerEDGE model, employability includes career development learning, work and life experience, understanding of disciplinary knowledge and skills, general skills, and emotional intelligence [2]. The differences in talent training specifications in higher education are reflected in the differences in professional skills (understanding of disciplinary knowledge and skills). This study focuses on the suitability of professional skills demanded by employers from the perspective of employers and the professional skills taught in universities.

1.2. Landscape professional clusters

In 2011, landscape architecture was added as a first-level discipline. The landscape architecture profession in China officially entered a period of rapid development, with many universities across the country offering majors such as landscape architecture, landscape gardening, and landscape engineering technology. Based on the fundamental skills of "landscape plant production, landscape design drawing, landscape engineering construction, and landscape green space maintenance" [3], landscape architecture has formed three major employment directions: "landscape planning and design," "landscape construction management," and "landscape plant planting and maintenance."

2. Research design

2.1. Data collection

This study collaborated with the Yunnan Provincial Association of Landscape Industry and the Kunming Municipal Association of Landscape Industry to conduct data collection through online questionnaires. A total of 326 practitioners in the landscape industry were surveyed regarding the typical job skill requirements, and 320 valid questionnaires were obtained.

According to the "Classification of Occupations of the People's Republic of China (2022 Edition)," the landscape industry positions mainly fall under the categories of "construction engineering technicians (GBM 20218), forestry engineering technicians (GBM 20220), and greening and gardening service personnel (GBM 40910)." Combined with the research on job positions in landscape enterprises currently in the market, the questionnaire set up six evaluation positions: designer, gardener, green space maintenance, construction worker, clerk, and information officer. Based on the talent training programs of over 20 Chinese landscape architecture majors, 24 typical professional skills were extracted for the study and presented in random order in the questionnaire.

2.2. Research methods

To explore the demand for professional skills from the employer's perspective, after obtaining basic knowledge through preliminary descriptive statistics of various landscape professional skills, this study conducted cluster analysis on different positions based on the selection of professional skill combinations to examine the distinguishability of existing positions in the landscape industry and their alignment with existing professional directions. Cluster analysis generally uses relative distances in sample feature space to measure the similarity between samples, dividing them into several clusters, with the goal of minimizing the differences within the same cluster and maximizing the differences between different clusters [4]. This study used the hierarchical clustering method in SPSS27 software to implement agglomerative hierarchical clustering.

3. Data analysis

3.1. Frequency statistics

(1) Frequency statistics of skills: Important skills

Looking at the frequency of selection of professional skills across all categories of landscape positions, nine skills, including Landscape Planting Design, Computer-Aided Rendering, Engineering Construction Drawing Interpretation, Small-Scale Landscape Planning and Design, Large-Scale Landscape Planning and Design, Project Construction Organization Management, Landscape Plant Recognition, Construction Drawing, Medium-Scale Landscape Planning and Design, were chosen in over one-third of cases, indicating a relatively high frequency. Among these, Landscape Planting Design and Computer-Aided Rendering had the highest frequencies, each accounting for over 40% of all cases. Conversely, five skills including Landscape Plant Production and Breeding, Landscape Machinery Maintenance, Floral Arrangement Art and Micro-Landscape Production, Media Platform Operation and Project Marketing, and Dried Flower Production and Floral Decoration were chosen in less than one-fifth of cases, categorizing them as low-frequency skills in this study (**Figure 1**).

(2) Position frequency statistics

Frequency statistics were conducted on evaluated positions, revealing that positions of designer, gardener, and construction worker had relatively large amounts of data, while positions of green space maintenance, clerk, and information officer had fewer than 30 entries, indicating a small sample size. This suggests a quantitative analysis with certain representational shortcomings, necessitating corrections when analyzing the intersection between positions and professional skills (**Figure 2**).
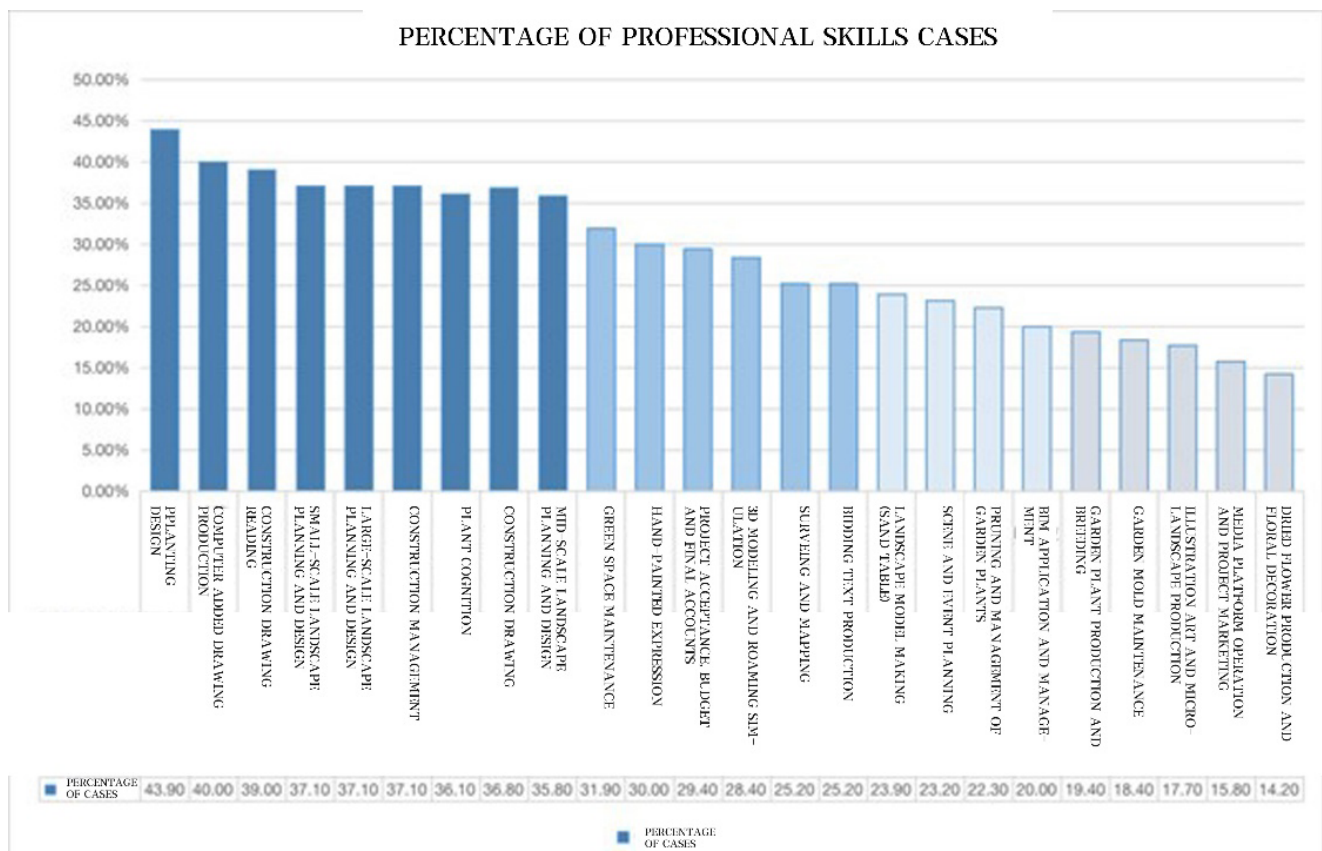

Figure 1. Proportion of selected professional skills in the landscape industry demand
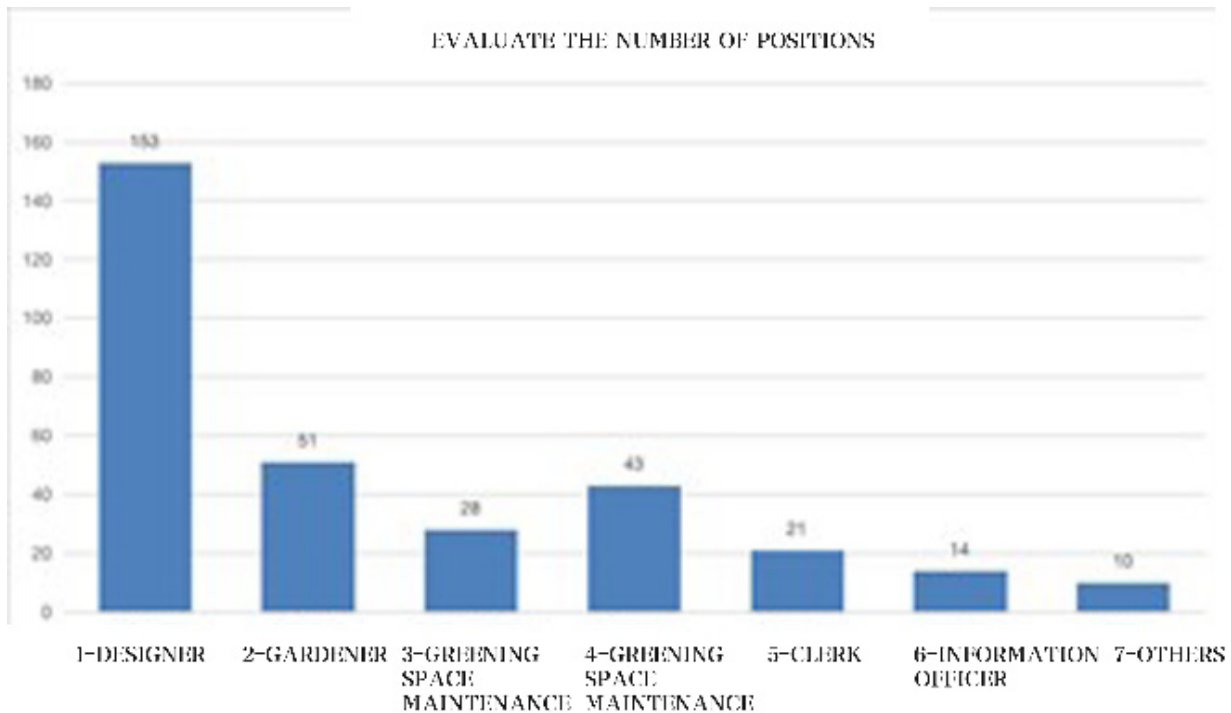
Figure 2. Comparison of evaluated job positions in the survey

3.2. Cluster analysis: Identifying similar positions

After standardizing the statistical data on skill selection for each evaluated position, a cluster analysis was conducted on the six positions, resulting in a dendrogram (**Figure 3**). It was observed that the professional skill requirements for information officers and clerks recruited in the current market were very similar to those for construction workers, with differences in position names attributed to varying job emphases in different work units. Significant differences in skill sets were found between green space maintenance and all positions except for gardener, indicating distinct professional directions. Surprisingly, the differences in skill requirements between designers and construction workers were similar to those between designers and gardeners, much smaller than those between gardeners and construction workers. Further interviews with employers revealed that the comprehensive nature of the skill requirements for designer positions is continuously increasing, with enhanced flexibility in job tasks and career development directions, making them positions that balance both construction and horticulture aspects. It is speculated that this reflects the demand for composite talents due to the inability of small and medium-sized enterprises in the landscape industry to finely divide job responsibilities.
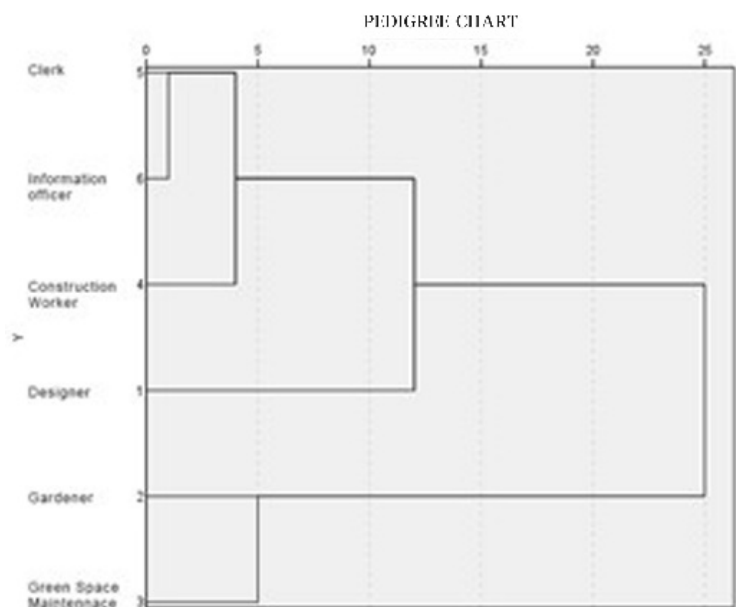

Figure 3. Clustering pedigree chart of landscape positions

4. Conclusion and outlook

Current university talent cultivation programs generally focus on market position surveys and divide skill requirements and teaching tasks based on traditional positions. However, in reality, "typical job tasks have a future orientation and may involve tasks that currently do not exist" [5]. Based on the landscape architecture industry, this study innovatively quantitatively explores the similarities and differences in professional skills between different positions within the employer position evaluations, revealing a significant trend of convergence between traditional employment training directions, "landscape design and construction," and "landscape planting and maintenance." This has certain reference value for the setting of skill modules for future university landscape architecture talent cultivation and has implications for the exploration of employment skill requirements in other industries.

This study presupposed six basic evaluated positions, but according to the analysis of position data and interviews with employers, small and medium-sized enterprises in the landscape industry often have situations where one person simultaneously undertakes some job tasks of multiple positions. Universities should actively explore the setting and matching of technical skills for "new" positions oriented towards the future in cooperation with industry associations and close coordination with enterprises.

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Disclosure statement

The authors declare no conflict of interest.

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