

A LONGITUDINAL ANALYSIS OF LANDSCAPE ARCHITECTURE STUDENTS' PERSPECTIVES ON PROFESSIONAL EDUCATION AND CAREER

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Abstract. Based on the rapid development process and increasing global recognition of the landscape architecture (LA) profession, this study aims to analyze the attitudes of LA students towards their professional education and future careers by identifying key influencing factors. The study specifically investigates how students' perceptions have changed on their education and career by examining their approaches longitudinally over a 12-year period. Data were collected annually through questionnaires administered at Istanbul University-Cerrahpaşa, Department of Landscape Architecture. Exploratory factor analysis was used to determine the dimensionality and grouping of the questionnaire's statements. Five key factor groups were identified, entitled as "The contribution of LA", "Professional competence and education", "Effects on life", "Improvement of professional qualifications" and "Professional enthusiasm". Correlation analysis was then conducted to examine the relationships between these factors and key student characteristics and reasons for choosing the department, planned working areas and sectors. The findings indicate that job selection was primarily influenced by job-related considerations, and most participants preferred to work in positions connected to LA. The most influential factors shaping students' attitudes were "the contribution of LA" and "professional competence and education". While students expressed a high level of agreement with statements related to societal and personal benefits of LA, their confidence in the sufficiency of their professional education was moderate. These findings highlight the need for a comprehensive enhancement of the landscape architecture curriculum by integrating more applied and technical courses that incorporate practice-oriented content, enhancing career counseling through mentoring programs, and promoting continuous professional development via targeted workshops and internships. In addition, fostering collaboration with sector professionals and refining student recruitment strategies are essential to better align educational experiences with professional practice and ensure that graduates are well-prepared for the demands of the field.

Keywords: *career planning, job-related attitudes, students' perceptions, landscape architecture career, undergraduate education, curriculum development*

Introduction

In the 21st century, landscape architecture is not only an aesthetic discipline but also a fundamental tool in tackling global crises such as climate change and sustainability. According to modern theory and practice, landscape contains natural and structural components, considering nature and humanity as a unified whole. The multidisciplinary nature of LA makes it central to addressing diverse sustainable development issues, including poverty reduction, improving quality of education, ensuring gender equality, and promoting economic growth (Alonso de Medina, 2022). The discipline deals with socio-cultural, economic and ecological parameters, as well as planning, designing and

managing natural and built environments. It utilizes knowledge and methods from many social, economic, and nature-based disciplines and also considers aesthetic and scientific principles (ECLAS-IFLA, 2023). LA focuses on the interactions between natural and cultural ecosystems, as well as issues of ecosystem stability, socio-economic improvements, community health and welfare (Vries et al., 2021).

Today, the scope of landscape architects is expanding due to the evolving global agenda. Modern challenges such as population growth, industrial concentration, energy consumption, resource depletion and environmental degradation pose significant issues for LA (Hsu and Ou, 2022). Landscape architects face a wide range of responsibilities in planning and design, including creating resilient landscapes for a changing climate, addressing rapid urbanization, planning for natural disasters, conducting ecological restoration of degraded urban areas, protecting finite water resources, managing the growth of informal settlements, incorporating an ecological shift in urban planning, and linking ecological knowledge with the implementation of design (Kriers et al., 2020; Steinitz, 2020; Herman and Rodgers, 2020). Additionally, climate change mitigation and adaptation efforts, new technologies, social justice, equity and improving the capacity and awareness of LA decision-makers have become critical issues in both professional practice and education (Carbonell-Carrera et al., 2020; Cipriani and Villalobos, 2023; Moosavi et al., 2023).

In LA education, professionals are also required to have a broad understanding of social sciences, including strategic planning, business administration, participatory and conflict management, environmental law and policy, planning, collaborative team working, leadership and communication skills (Steinitz, 2020; Alias et al., 2021; Kempenaar, 2021). Increasingly, landscape architectural plans are being implemented at various scales of human intervention, with landscape architects called upon by governments and the private sectors to develop plans that meet public health, safety, and welfare standards (Kristiánová et al., 2017; Mansuroğlu et al., 2024). Further, private property rights, public awareness and development of democratic processes continue to influence the development of LA and related education systems (Teqja and Karaj, 2022).

LA education, research, and careers interact with a diverse range of disciplines, such as architecture, industrial design, visual communication, fashion, civil engineering, urban planning, remote sensing, ecological sciences, geography, digital technology, forestry, agriculture, policy and management, human interactions, and art (Uzun, 2020; Bryant, 2021; Guo et al., 2021; Kurjenoja et al., 2021; Fricker et al., 2023; Shen, 2023). Besides the main components of LA disciplines, such as climate, geology, hydrology, ecology, and perception, the agency of landscape architects in climate change leadership, integration of LA into sustainable energy systems, integrating big data and digital technology into LA analysis and research, circular economy, biodiversity regenerative design, urban greening and placemaking, social equality and inclusive design and collaboration are some of the core issues for the future (Steinitz and Orland, 2020; Gou et al., 2021; Sørensen et al., 2022; Marques, 2023; Moosavi et al., 2023; Wang and Ma, 2024). LA is an interdisciplinary field that draws from this wide variety of subjects and landscape architects who focus on landscapes in an integrated manner have unique and distinctive features through this perspective (Benson and Roe, 2000).

Notably, artificial intelligence (AI) is playing a transformative role in design, planning, and management processes, addressing challenges like urbanization, ecological decline, and limited public participation (Xing et al., 2024). Bartelse et al. (2024) emphasize the potential of digital technologies in LA education, underlining the

importance of fostering interdisciplinary approaches. Shen et al. (2024a) also highlight the increasing role of technology and digital tools in recent research regarding LA, particularly in the areas of “Ecological Restoration and Enhancement” and “Climate Change and Adaptation”. This approach points to the importance of integrating developments in technology and information systems into LA education.

The growing global demand for balancing development with sustainable ecological, economic, and social management has broadened the scope of responsibility for LA. This highlights the critical importance of advancing the education system, particularly by integrating the concept of sustainability and fostering the development of LA education within the framework of education and innovation (Sayan Atanur et al., 2020). IFLA (2022) also underlines that LA is related to 17 of the Sustainable Development Goals, from poverty reduction to gender equality, and from sustainable cities to climate action. This requires advancing students' abilities to understand sustainability in its multiple dimensions and preparing them for the field's modern demands.

In this context, this study aims to determine the key dimensions of students' perceptions of landscape architecture. It seeks to understand their attitudes towards the profession and vocational education by analyzing the relationships between these dimensions and various student characteristics. The findings are expected to contribute to curriculum design and career support services in the light of the findings on vocational education, career perceptions and career planning. This study has the potential to shape the future of landscape architecture education by filling the gaps between education and the needs of future landscape architects. Further, in light of the relationship between education and the sector, these findings will also contribute to the long-term resolution of problems facing the field of landscape architecture.

Review of literature

The historical development of “landscape” as a concept has expanded and diversified the field of LA as a career path. “Landscape” was first defined as “the total character of a region in the mid-18th century. The concept was later broadened to include the cultural landscape (Schmithüsen, 1942) and historic cultural elements in the landscape (Wöbse, 2001; Potschin and Bastian, 2004). The concept is also associated with the natural sciences and the study of human impact on landscape ecosystems (Leser, 1997). “Landscape” grew to include relief, soil, climate, water balance, flora, fauna, people, and artefacts (Neef, 1967) as well as the integration of these components into a geographical complex or geosystem (Haber, 1995). Thus, the contemporary concept of landscape ecosystem emerged, defined as a spatial pattern of abiotic, biotic, and anthropogenic components that form a unified functional entity, and which serve as an environment for people. These approaches have made landscape a key concept based on ecological principles and related to nature conservation and recreation (Troll, 1971).

LA has emerged and evolved in parallel with these developments. LA was initially defined as the art or science of arranging soil, together with the spaces and objects on it, for safe, productive, healthy, and pleasant human use (Newton, 1971). As a professional field and academic discipline, LA later expanded to include the complex and interdisciplinary shaping of landscapes at various scales (Gazdova, 2002; Bruns et al., 2010). The multidimensional nature of landscapes and human interaction makes LA a broad subject area (Fetzer, 2014). In this context, the discipline deals with cultural,

architectural, urban, and natural elements, as well as economic and ecological parameters, and utilizes knowledge and methods from many social, economic, and nature-based disciplines (Steenbergen and Reh, 1996; Fetzner, 2014). LA must also be subject to a continuous process of transformation due to factors such as population growth, urbanization, changing human needs, climate crises, and natural disasters. These changes reflect shifting fashions, human tastes and needs, and new technologies (Kuc, 2015). LA is therefore a blend of science, art, vision, and thought. The profession of LA relies on dedication to public safety, health, and welfare, and recognition and protection of the land and its resources (Sullivan, 2010).

The International Federation of Landscape Architects (IFLA) defines a landscape architect as “The person who is planning and designing the aesthetic arrangement of parks, recreation facilities, roads, commercial, industrial and residential areas, consults with customers, engineers and architects, examining land conditions such as soil, vegetation, drainage, location of structures, designing the harmonious development of the planned areas with the existing site features and structures, preparing the drawings, technical specifications and cost calculations included in the land development studies and inspecting the compliance of the applications with the specified technical specifications” (IFLA, 1989). In the Turkish Professions Dictionary, a landscape architect is defined as a “qualified professional who works in the planning, design, protection, development and management of nature and the environment in accordance with economic, functional, ecological and aesthetic measures to best meet human needs” (PMO, 2023).

In Türkiye, the public organization of LA began with the Landscape Architecture Association, first established in Ankara in 1966; the Chamber of Landscape Architects was established later, in 1994. The education process of LA began in Türkiye under the Ornamental Plants Section of the Ankara Higher Agriculture Institute in 1933. LA education expanded from 1968 onwards under the Department of Landscape Architecture at Ankara University. However, the first graduation of class of landscape architects did not emerge until 1989, with the first graduates of Istanbul University-Cerrahpaşa's (IUC) Faculty of Forestry, Department of Landscape Architecture. Today, undergraduate education in LA is offered by the Landscape Architecture departments of 43 universities, operating under various faculties such as forestry, agriculture, fine arts, architecture, and design.

There are some problems in the field of landscape architecture education in Türkiye. These problems can be listed as (i) high student quotas in universities, (ii) insufficient academic staff in many departments, (iii) offering landscape architecture education in many universities (43 faculties), (iv) lack of accredited departments, (v) economic crisis and its impact on professional education. The sectoral problems can be mentioned as (i) insufficient number of qualified personnel (a large number of new graduates, while at the same time a lack of experienced personnel), (ii) lack of recognition and authority of the profession/ suppressing the profession of landscape architecture from many other professions, (iii) inadequate financial resources allocated to landscape architecture and architects, (iv) insufficient legal regulations and enforcement, (v) lack of awareness and disregard for landscape architecture profession and issues at the administrative level, (vi) low budgets or salaries for landscape architects, (vii) ethical issues, (viii) working hours and insufficient wages, (ix) difficulties in finding a job/unemployment. These sectoral problems also should be considered in the context of educational challenges.

Material and methods

The research was conducted at Istanbul University-Cerrahpasa (IUC) Faculty of Forestry, Department of Landscape Architecture which was established under Istanbul University's Faculty of Forestry in 1984, began education in 1985. In 1989, the department was the first in Türkiye to award diplomas and confer the professional title of landscape architect (IUCFoF, 2023). As the first department in Türkiye to grant the professional title and diploma of Landscape Architect, the IUC Department of Landscape Architecture offers a more focused case study in identifying the root problems of LA education in the country. IUC Faculty of Forestry Department of Landscape Architecture represents a decent case as it provides education in a metropolis such as Istanbul, where urbanization, forest and environmental interactions are becoming essential.

Questionnaires were used as the primary data collection tool and were administered to senior-level students. The questionnaire was conducted for 12 years (between the 2010-2011 and 2022-2023 academic years) and included 518 students. The application of questionnaires started on May 23, 2011 and continued until May 26, 2023. The questionnaires were distributed in the classrooms and participants were verbally informed about its scope and intended use. At the beginning of the application of questionnaire, participants were explicitly informed about the assurance of anonymity, and it was stated that their participation was voluntary and they could withdraw their responses at any time. Participants' personal information, such as name, surname, identification number, email, and phone number, was not collected, thereby ensuring the anonymity of the process.

The features of these participants in terms of graduation year, type of high school, gender, and university exam preference are illustrated in *Tables 1* and *2* show the reason for choosing the department (LA) and the students' planned working area and sector. The questionnaire first identified the characteristics of the participants, including their reasons for choosing the LA department and their future career plans. This set of questions was designed as multiple-choice. The next part assessed students' attitudes towards their education, jobs, and future careers. A five-point interval scale was used in which a value of 5 corresponded to "strongly agree", and a value of 1 corresponded to "strongly disagree".

The collected data were analyzed by SPSS (Statistical Package for the Social Sciences). Missing data were excluded from the analysis. First, a reliability analysis was conducted to determine the reliability of the scale and correlation of coefficients. The estimate of Cronbach's alpha (α) for the scale is $\alpha = 0.91$, which means that the scale has a high level of reliability. Item-total correlation was analyzed, and items with a positive correlation value greater than 0.25 between each item and the total score of the remaining items were retained in the scale (Kalaycı, 2006). In this context, questions related to the impact of internships on professional preparedness, perceiving the chosen department as suitable at the beginning of education, having a positive attitude toward the profession before selecting it, and the anticipated future popularity of the profession were removed from the scale and excluded from the final evaluation.

The study adopts a quantitative approach and aims to identify students' perceptions of their professional education processes and their perspectives on their profession. In this context, the following hypotheses have been formulated as:

H₁: The attitudes of landscape architecture students toward their education and career exhibit a multifactorial structure with various dimensions.

H₂: The attitudes of landscape architecture students toward their job are meaningfully clustered around personal, societal and profession-related factors.

Table 1. *The features of students that participated in the questionnaires*

Features of student		N (frequency)	% (percentage)
Type of high school (HS)	Public HS	133	25.7
	Anatolian HS	287	55.4
	Vocational HS	8	1.5
	Private HS	41	7.9
	Other	48	9.3
	No response	1	0.2
Gender	Female	434	83.8
	Male	80	15.4
	No response	4	0.8
Rank of preference in the university entrance exam	High-level	236	45.6
	Middle-level	151	29.2
	Low-level	108	20.8
	No response	23	4.4
Graduation year	2010-2014	151	29.2
	2015-2018	197	38.0
	2019-2023	170	32.8

Table 2. *Students' reasons for choosing the department, planned working area and sector*

Features of student		N (frequency)	% (percentage)
Main reason for choosing the LA department	Job-related factors	365	70.5
	Non-job-related factors	129	24.9
	Job and non-job-related factors	24	4.6
Planned working area	LA-related jobs	449	86.7
	Jobs except LA	48	9.3
	Both	21	4.1
Planned working sector	Public institutions	90	17.4
	Private enterprises	91	17.6
	Academia	54	10.4
	Starting own business	101	19.5
	Multiple choice	182	35.1

These hypotheses were tested with Exploratory factor analysis. Exploratory factor analysis was used to reduce the set of variables and generate a data set by determining their dimensionality and grouping the questionnaire's statements. Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity analysis were used to determine the appropriateness of the data set. The KMO measure of sampling adequacy is 0.93, and the significance of Bartlett's test (p) is $p = 0.00$. Bartlett's test of sphericity is

statistically significant ($p < 0.01$), and the KMO value of 0.93 is high. This data shows that the scale is highly suitable for analysis (Watkins, 2021). The factor numbers were determined by considering the eigenvalues greater than 1; five-factor groups were determined with a total variance of 58%. By considering the variances of the factors, the Direct Oblimin method was used for oblique rotation. The variables with a load factor less than 0.5 were excluded from the evaluation (Zeynivandnezhad et al., 2019; Garson, 2023). In this context, the items related to having long aspired to pursue the profession, engaging in conversations about topics related to the field of study, and the belief in finding job after completing the program were also excluded from the evaluation. Thus, the validity of the scale was ensured. The factor groups under which the variables were categorized were determined based on their factor loadings.

The factors were named by analyzing the content of the variables representing them and evaluating their conceptual relevance. The variable “Recommendation of job to other people” was associated with two factors; in this case, its final classification was determined by considering the overall content and meaning of the factors. The names determined to factor group statements and the sample questions (variables) within these groups can be seen in *Table 3*.

The other hypotheses of the study are listed below:

H₃: There is a significant relationship between landscape architecture students' individual and academic characteristics and their attitudes toward education and career.

H₄: There is a significant relationship between landscape architecture students' reasons for choosing their department, their planned fields and sectors of work after graduation, and their attitudes toward education and career.

These hypotheses were also tested using correlation analysis. Correlation analysis was then used to examine the relationships between the variables and factors. Correlation analysis is a statistical method used to test the linear relationship between two variables or the relationship among more variables and to measure the direction and degree of this relationship (Özdamar, 2004; Kalaycı, 2006). The questions were also tested for normal distribution; since the variables were not normally distributed, Spearman's rank correlation was used to examine the relationships among the factors and between the factors and independent variables.

Table 3. Factor groups and sample items

Factor group	Sample items
The contribution of landscape architecture	<ul style="list-style-type: none"> - I believe my profession will positively contribute to my personality - I feel that my profession will enable me to contribute to society - My profession will have a positive impact on my social life
Professional competence and education	<ul style="list-style-type: none"> - The practical knowledge I have acquired in my field is sufficient - I believe I will graduate with adequate knowledge and skills - As a result of my education, I feel prepared to practice my profession
Effects on life	<ul style="list-style-type: none"> - My profession is a popular career choice - The income level of my profession is satisfactory - My profession will grant me social prestige
Improvement of professional qualifications	<ul style="list-style-type: none"> - I actively follow developments in my field (e.g., books, journals, internet sources) - Even without the pressure of passing exams, I regularly engage with topics related to my field - In my free time, I work on improving myself professionally
Professional enthusiasm	<ul style="list-style-type: none"> - My profession is an ideal career choice - If I had to take the university entrance exam again, I would choose this field - I would recommend my profession to others

Findings

The factors affecting LA students' attitudes towards their occupations

According to the factor analysis results, five main factors were identified (see *Table 4*). The first factor (F1) is “the contribution of LA,” representing 30.62% of the total variance. This factor is, therefore, the most important in describing LA students' attitudes and consists of eight items: the positive contribution of LA to one's personality, the feeling of being helpful to society, the positive effect of the future job on one's social life, the spiritual satisfaction level, the consideration of LA as an ideal job, LA as a source of happiness, feeling honored to have chosen LA, and LA as a source of prestige.

The second factor (F2) accounts for 11.64% of the total variance and can be defined as “professional competence and education”. This factor includes statements on the sufficiency of the LA program's applied and technical courses and courses on technical sciences, biological-ecological sciences, and socio-economic sciences. F2 also consists of the sufficiency of education in preparing students to do the job and apply professional methods and techniques.

Table 4. Factors contributing to students' attitudes towards LA

Factor code	Factor	Variable	Load of variable	Load of factor (%)	Cronbach's alpha (α)
F1	The contribution of LA	Positive contribution of LA on personality	0.86	30.62	0.88
		Contributing to society through LA	0.76		
		Positive effect of LA on social life	0.75		
		High level of spiritual satisfaction as LA	0.62		
		Being happy by working as LA	0.60		
		Consideration of LA as an ideal job	0.59		
		Feeling honored to have chosen LA as a job	0.55		
		Societal prestige from being a LA	0.54		
F2	Professional competence and education	The sufficiency of applied courses	0.79	11.64	0.86
		Faith in graduating with sufficient knowledge and experience	0.78		
		Faith in the sufficiency of received education for professional life	0.74		
		The sufficiency of courses taken on technical sciences and design	0.70		
		The sufficiency of theoretical courses	0.68		
		The sufficiency of courses taken on biological-ecological sciences	0.67		
		Feeling ready to do the job upon graduation	0.66		
		The sufficiency of courses taken on socio-economic sciences	0.52		
Feeling ready to apply professional methods and techniques effectively	0.51				
F3	Effects on life	Considering LA as a popular job	0.76	6.31	0.64
		Considering income as LA to be satisfactory	0.68		
		Considering LA to have a positive societal image	0.65		
		Considering LA to have good working conditions	0.52		
F4	Improvement of professional qualifications	Effort to follow developments related to LA	0.89	5.25	0.78
		Ability to improve occupational skills	0.77		
		Interest in LA outside of education	0.75		
F5	Professional enthusiasm	Defining LA as their ideal job	-0.77	4.05	0.75
		Desire to choose LA if the exam were retaken	-0.62		
		Recommendation of job to other people	-0.52		

The third factor (F3), labeled “effects on life”, represents just 6.31% of the total variance and has four items: popularity, income level, working conditions, and societal

perception. The last two factors were “improvement of professional qualifications” (F4) and “professional enthusiasm” (F5), with shares in the total variance of 5.25% and 4.05%, respectively. F4 includes items on the effort to follow developments in LA, the ability to improve occupational skills, and the interest in LA outside of education. F5 concerns whether LA was the students’ ideal job, their desire to choose LA again if the university exam were retaken and whether they would recommend LA to others.

Among the F1 items, the desire to feel helpful to society as a LA had the highest level of agreement (M = 4.23). It was followed by students’ perceptions that LA would positively contribute to their personality (M = 3.97) and that they would be happy working as a LA (M = 3.95). Respondents also agreed that they felt honored to have chosen LA (M = 3.74), that LA had a positive effect on their social life (M = 3.76) and spiritual satisfaction (M = 3.76), and provided societal prestige (M = 3.71). The lowest and moderately evaluated item of F1 was students’ view of LA as an ideal job (M = 3.48) (Table 5).

Table 5. Descriptive statistics of the expressions regarding participant attitudes

Factor code	Factor	Variable	Mean	Std. deviation	Variance
F1	The contribution of LA	Positive contribution of LA on personality	3.97	0.81	0.65
		Contributing to society through LA	4.23	7.61	0.57
		Positive effect of LA on social life	3.76	0.89	0.80
		High level of spiritual satisfaction as LA	3.76	1.02	1.05
		Being happy by working as LA	3.95	0.89	0.79
		Consideration of LA as an ideal job	3.48	0.96	0.93
		Feeling honored to have chosen LA as a job	3.74	1.00	1.00
		Societal prestige from being a LA	3.71	0.90	0.81
F2	Professional competence and education	The sufficiency of applied courses	2.38	1.01	1.02
		Faith in graduating with sufficient knowledge and experience	2.63	1.06	1.13
		Faith in the sufficiency of received education for professional life	2.67	1.06	1.13
		The sufficiency of courses taken on technical sciences and design	2.78	1.12	1.27
		The sufficiency of theoretical courses	3.07	1.04	1.08
		The sufficiency of courses taken on biological-ecological sciences	3.43	1.00	1.01
		Feeling ready to do the job upon graduation	2.88	1.02	1.04
		The sufficiency of courses taken on socio-economic sciences	3.13	0.92	0.84
Feeling ready to apply professional methods and techniques effectively	3.21	0.93	0.87		
F3	Effects on life	Considering LA as a popular job	2.87	1.04	1.10
		Considering income of LA as satisfactory	2.71	1.63	2.66
		Considering LA to have a positive societal image	3.09	1.07	1.15
		Considering LA to have good working conditions	2.88	1.00	1.00
F4	Improvement of professional qualifications	Effort to follow developments related to LA	3.95	0.79	0.63
		Ability to improve personal occupational skills	3.67	0.91	0.83
		Interest in LA outside of education	3.79	0.87	0.76
F5	Professional enthusiasm	Defining LA as their ideal job	2.50	1.08	1.18
		Desire to choose LA if the exam were retaken	3.05	1.26	1.60
		Recommendation of job to other people	3.26	1.17	1.36

In F2, the highest evaluated expression was the sufficiency of the courses taken on biological-ecological sciences (M = 3.43). Also assessed at a high level were the statements on feeling ready to apply professional methods and techniques (M = 3.21), the sufficiency of courses taken on socio-economic sciences (M = 3.13), and the

sufficiency of theoretical courses (M = 3.07). The expressions that were ranked moderately concerned feeling ready to do the job upon graduation (M = 2.88), the sufficiency of courses in technical sciences (M = 2.78), the sufficiency of one's education to professional life (M = 2.67), and the belief that the respondents were graduating with sufficient knowledge and experience (M = 2.63).

The statement rated at the lowest level by the participants related to the sufficiency of applied courses (M = 2.38). All the expressions of F3 were evaluated moderately. These statements include LA as a job with a positive image (M = 3.09), faith in having good working conditions (M = 2.88), LA as a popular job (M = 2.87), and viewing the income level of LA as satisfactory (M = 2.71). All the expressions of F4, however, were evaluated highly. These statements concerned the effort to follow developments related to LA (M = 3.95), interest in the field of LA (M = 3.79), and the ability to improve personal occupational skills (M = 3.97). Lastly, the expressions of F5 were ranked at multiple levels: recommendation of LA to other people (M = 3.26) and desire to choose LA if the exam were retaken (M = 3.05) were evaluated at a moderate level, while there was a low level of agreement with the statement that LA was the job they wanted (M = 2.50).

Assessment of landscape architecture students' attitudes in terms of their features

The LA students' attitudes were evaluated based on their fundamental features, reasons for job preference, and career plans. A deeper analysis of the correlations highlights key implications for professional education and career outlook. Graduation year was positively correlated with F1 (r = 0.18, p = 0.00), F2 (r = 0.22, p = 0.00), and F5 (r = 0.09, p = 0.02). In general, this indicates that attitudes regarding the contribution of LA, professional competence and education, and professional enthusiasm tend to increase over time (Table 6). In other words, students' positive perceptions of these aspects become more pronounced over time; their recognition of LA's contributions (F1), their professional competence and education (F2), and their intrinsic motivation and passion for the profession (F5) tend to increase. The strengthening of these perceptions over time suggests that prolonged exposure to the discipline, combined with academic and practical experiences, reinforces students' confidence in their professional capabilities and their commitment to the field.

Table 6. Correlation between LA students' attitudes and their features

Factor		Graduated high school	Gender	Rank in uni. exam	Graduation year
F1	r	0.03	-0.02	0.11*	0.18**
	p	0.47	0.52	0.02	0.00
F2	r	0.07	0.04	-0.02	0.22**
	p	0.07	0.43	0.69	0.00
F3	r	-0.02	0.05	-0.04	-0.08
	p	0.68	0.25	0.35	0.08
F4	r	-0.05	-0.07	-0.08	0.02
	p	0.26	0.07	0.06	0.67
F5	r	-0.04	-0.01	0.15**	0.09*
	p	0.37	0.95	0.00	0.02

r = correlation coefficient

p = sig. (2-tailed)

*Correlation is significant at the 0.05 level (2-tailed)

**Correlation is significant at the 0.01 level (2-tailed)

The preference rank of the department in the university exam also had a positive relationship with F1 ($r = 0.11$, $p = 0.02$) and F5 ($r = 0.15$, $p = 0.00$). This finding suggests that students who placed a higher preference on LA in their university selection process demonstrate greater appreciation for LA's contribution and a stronger affinity for the profession. Thus, initial motivation for choosing LA appears to be an influential factor in shaping students' professional outlooks. No relationship was found between LA students' attitudes, the type of high school they graduated from, or their gender. Likewise, no significant correlation emerged between high school type or their gender and perceptions of LA effects on life (F3) of the improvement of professional qualifications (F4) (Table 6). This indicates that these factors do not play a central role in shaping students' perception of LA education and career.

Table 7 illustrates the correlations between student attitudes, their reason for choosing the LA department, and their planned working areas and sectors. Notably, "the reason for choosing the LA" showed a significant relationship with all measured factors, reinforcing the notion that motivations behind selecting the field strongly influence students' perspectives. This also means students' motivations for selecting LA as their field of study play a pivotal role in shaping their career perspectives. This variable (the reason for choosing LA) had a positive correlation with the contribution of LA ($r = 0.32$, $p = 0.00$), professional competence and education ($r = 0.12$, $p = 0.00$), effects on life ($r = 0.95$, $p = 0.03$), the improvement of professional qualifications ($r = 0.25$, $p = 0.00$), and professional enthusiasm ($r = 0.41$, $p = 0.00$). These findings suggest that students who selected LA due to job-related factors tend to develop more favorable perceptions of their career choice, likely due to a stronger intrinsic motivation and alignment with professional aspirations. Further this strong relationship suggests that students who selected LA due to intrinsic interest or career-related considerations tend to perceive the profession more positively across multiple dimensions.

Table 7. Correlation between LA students' attitudes, their reason for choosing LA, and their planned working areas and sectors

Factor		Reason for choosing LA	Planned working area	Planned working sector
F1	r	0.32**	0.29**	-0.12**
	p	0.00	0.00	0.00
F2	r	0.12**	0.11**	0.05
	p	0.00	0.01	2.94
F3	r	0.95*	0.17**	-0.04
	p	0.03	0.00	0.36
F4	r	0.25**	0.19**	0.17**
	p	0.00	0.00	0.00
F5	r	0.41**	0.28**	0.07
	p	0.00	0.00	0.07

r = correlation coefficient

p = sig. (2-tailed)

*Correlation is significant at the 0.05 level (2-tailed)

**Correlation is significant at the 0.01 level (2-tailed)

"Planned working area" was also correlated with all five factors. This variable correlated with the contribution of LA ($r = 0.29$, $p = 0.00$), professional competence and

education ($r = 0.11$, $p = 0.01$), effects on life ($r = 0.17$, $p = 0.00$), the improvement of professional qualifications ($r = 0.19$, $p = 0.00$), and professional enthusiasm ($r = 0.28$, $p = 0.00$). These results indicate that students with clear professional goals related to LA are more likely to hold positive perceptions of their field, possibly due to greater alignment between their aspirations and educational experiences. This result reinforces the idea that a clear career trajectory enhances their motivation. Further, students who planned to work in LA-related jobs also expressed stronger agreement with the statements regarding the benefits and significance of LA, compared to those intending to work outside the field. This trend underscores the role of career aspirations in shaping educational engagement and professional identity.

The “planned working sector” was related to two factors: the contribution of LA ($r = -0.12$, $p = 0.00$) and the improvement of professional qualifications ($r = 0.17$, $p = 0.00$). The negative correlation between planned working sector and LA’s contribution suggests a divergence in perception among students aiming for careers less directly associated with LA, indicating that sectoral differences may influence how students assess the relevance of their education. However, the positive relationship with improvement of professional qualifications indicates that regardless of sector choice, students still recognize the need for continuous professional development to remain competitive in their careers.

Overall, these findings highlight the importance of both intrinsic and extrinsic motivational factors in shaping students’ attitudes towards their education and future careers. The significant correlations suggest that educational experiences, career aspirations, and initial motivations all play interconnected roles in forming students’ professional identities. The observed correlations suggest that fostering career awareness and providing targeted educational support could enhance students’ long-term commitment to the profession.

Discussion

The education of the LA profession plays a crucial role as a discipline that provides nature-based solutions for urban sustainability, enhances societal quality of life, bridges human-nature interactions and raises awareness on these issues while inspiring many professions. To address modern societal needs and tackle current challenges like the climate crisis and related environmental problems, LA education requires continuous innovation (Xie et al., 2024). Training future landscape architects demands fostering design skills, developing ecological knowledge, enhancing awareness of ecological, economic, and social sustainability, and promoting logical thinking and problem-solving abilities. It also requires integrating technologies such as GIS, BIM, 3D visualization, VR, and AI, along with interdisciplinary skills. However, the diverse content of LA education has created challenges, including inconsistencies in faculty titles, curriculum alignment, and adaptation to current issues.

Landscape Architecture Departments worldwide differ in their faculty affiliations. For example, at Harvard University (Url 1), LA is part of “The Graduate School of Design,” while at Cornell University (Url 2), it is within “The College of Agriculture and Life Sciences.” At the University of Wisconsin-Madison (Url 3), LA is housed in the “College of Letters & Science” and the Department of Planning and Landscape Architecture. This diversity influences course curricula, though foundational courses like core studios, history of landscape, botany, landscape ecology, ecological

restoration, and drawing techniques are common across universities. Similarly, in Türkiye, 43 undergraduate programs operate under various faculties, including Forestry, Agriculture; Architecture, Art and Design, Fine Arts, Design and Architecture; Fine Arts and Design; Architecture and Design; Engineering and Architecture; and Fine Arts.

While courses such as core studios, landscape history, botany, landscape ecology, ecological restoration and drawing techniques are common across universities, their emphasis varies based on the affiliated faculty. For instance, design subjects dominate in architecture faculties while ecology is prioritized in forestry/agriculture faculties. This diversity enhances graduates' skills but creates challenges in maintaining quality standards. The affiliation of LA departments under different faculties also complicates employment, particularly in the public sector, as the education's content and scope lack standardization, despite all graduates earning the title "landscape architect" (Bostan and Gül, 2019; Kaymaz and Hoşgör, 2018). Achieving standardization requires accreditation, and in Türkiye, two organizations (PEMDER and TAPLAK) have been authorized by YÖK for this purpose, with six departments, including IUC, currently accredited.

As the first department in Türkiye to award the professional title and diploma of Landscape Architect, the IUC Department of Landscape Architecture provides a focused case for examining the root issues of LA education in the country. Research indicates that job-related factors were relevant to students' preference for LA as a profession (70%), and most students (86.7%) had a career plan to work in LA-related jobs. The research on LA students in the Faculty of Architecture and Design found that they preferred the department because they sought to become an LA (Demircan et al. 2019).

However, studies show low public sector employment for landscape architects in Türkiye, with limited recognition of their roles and responsibilities (Karadağ and Kesim, 2011). Positions directly related to LA, such as heads of parks and green spaces departments, are often managed by professionals from other disciplines, including forest and agricultural engineers, architects, and others (PMO, 2023).

Addressing the status and employment issues in the public sector is crucial for improving the LA education and career planning, as only 17% of students aim to work in public institutions. The result reflects the findings of the survey on LA students at graduation. Most students sought employment in private enterprises (55% at LA firms, 23% in architecture, engineering, or multidisciplinary firms, and 5% at design/build firms) (ASLA, 2022). This trend aligns with findings by Yao and He (2012), who highlighted a decline in LA students' interest in public sector roles and the need to increase demand for landscape architects in public institutions.

Most of the enterprises operating in the LA sector work in multiple fields, creating a demand for qualified, versatile human resources (Temiz and Yurdakul, 2022). However, graduates are often found lacking in practical skills, analytical thinking, responsibility, ethical awareness, and engineering knowledge needed by the private sector (Kaymaz and Hoşgör, 2018).

Courses in biological-ecological sciences, such as conservation, plant production, maintenance, ecological knowledge, are considered the most adequate in professional education. Gazvoda (2002) emphasizes that integrating natural sciences like soil science, botany, and ecology enables LA students to address complex spatial challenges. Similarly, Steinitz and Orland (2020) highlight the importance of combining technology and digitization with a strong foundation in climate, geology, hydrology, and ecology to effectively work across scales and contexts in the field.

The courses addressing social aspects are also essential for landscape architects. Society comprises diverse groups with distinct life and values (Thompson, 2002), requiring their inclusion in planning and design processes. Insights from social courses facilitate understanding and defining landscapes during design. Determining economic and environmental costs, generating a strategic approach to LA designs, communication, participatory process management, developing social networks, entrepreneurship and management are critical components (Calkins, 2005; Steinitz, 2020) that should be strengthened both in application and education.

To fulfill the educational objectives of LA departments, bridging the gap between theory and practice is essential (Milburn et al., 2003). Strengthening applied courses and adopting multi-dimensional approaches can address sectoral challenges by equipping students with relevant skills. Xi and Wang (2022) demonstrated that project-based learning fosters pro-environmental knowledge, attitudes, and values of LA students while Fekete and Toorn (2021) emphasized the importance of “learning by doing” in LA education in the European context. Shen et al. (2024b) identified deficiencies in horticultural and ecological knowledge within design education and underscored the need for design practice, fieldwork, and in-depth case studies for students, and improved collaboration among students, educators, and practitioners. Student feedback highlights the inadequacy of applied courses, despite their significant ECTS weight in design and planning (drawing techniques, perspective, basic design, architectural knowledge, detail drawing, painting techniques, etc.), planting application, and computer technologies.

The identified factors provide valuable guidance for curriculum development and policy formulation. The “professional competence and education” factor (F2) highlights the need to strengthen both theoretical and applied learning experiences. While theoretical courses were moderately rated, the relatively lower evaluation of applied courses suggests a need for practice-oriented modules, including real world projects, internship and sector collaborations to enhance professional readiness. Similarly, the “contribution of LA” factor (F1), encompassing personal growth, societal impact, and prestige, underscores the importance of promoting LA as a career with tangible social benefits. By integrating these insights, educational institutions and policymakers can adopt strategies such as mentoring programs, enhanced fieldwork, and regular curriculum reviews, aligning education with professional demands and student aspirations for long-term career success.

The moderate ratings in “effects on life” (F3) suggest ambivalence among students regarding job conditions and income expectations, indicating the need to integrate career planning and realistic job previews into the curriculum to align academic preparation with sectoral realities. While the moral contributions of the profession were evaluated highly, tangible aspects such as working conditions and income levels received moderate evaluations. Shaffer (2010) notes that LA students are often motivated by factors beyond monetary gain, with autonomy being a critical future goal. Similarly, the research in Australia highlights workload, financial pressure, and communication challenges as key concerns for LA students, who aim to improve income levels and achieve personal and professional satisfaction (Lawson et al., 2017). For female LA students, professional success is tied to position, fulfillment, and client satisfaction (Acuna, 2006), while American students value improving landscapes, multi-dimensional education, and job opportunities (Powers, 2000).

The high ratings in “improvement of professional qualifications” (F4) emphasize the importance of continuous professional development. Policymakers and educators should consider implementing ongoing training programs and partnerships with professional organizations to keep graduates competitive in the evolving field. Collectively, these findings advocate for a more practice-oriented, integrated curriculum that addresses both the technical and psychosocial dimensions of LA education, thereby aligning academic programs with the demands of the professional landscape. To address students’ moderate willingness to recommend or reselect LA and their low agreement on LA being their ideal career, initiatives such as mentorship programs, alumni networking, and workshops on professional identity can foster intrinsic motivation and reinforce LA as a desirable career. These findings advocate for a practice-oriented, integrated curriculum that addresses both the technical and psychosocial dimensions of LA education, aligning academic programs with professional demands.

While the students expressed a desire to enhance their professional competencies, their enthusiasm for the profession showed a low level of agreement. Research conducted with LA graduates in Türkiye (working as landscape architects) revealed that only 47.3% would choose the same profession again or recommend it to relatives, indicating moderate satisfaction (Gül et al., 2011). These findings highlight parallels between the attitudes of LA students and graduates, emphasizing the need for targeted solutions. Further, Lawson (2010) stressed the importance of incorporating diverse student perspectives to better prepare graduates for professional practice.

Addressing challenges in LA education and training more competent professionals requires alignment with emerging trends in both academia and the sector. Future academic issues include the human dimensions of planning and design, built environments and infrastructure, global landscape issues, and green urban development (Meijering et al., 2015). Current sectoral focuses encompass sustainable design, site engineering, construction techniques, web-based technologies, assessment of social benefits, understanding the environmental context, participatory research methodologies, landscape urbanization, the integration of multi-purpose approaches, spatial orientation skills, geospatial technologies, climate change amelioration and adaptation, communication, interdisciplinary cooperation and the legal, political, institutional, and policy frameworks affecting landscape conservation and development (Milburn and Brown, 2016; Ruggeri and Young, 2016; Yang et al., 2016; Rodgers et al., 2020; Kaplan, 2009; Jorgensen et al., 2022; Carbonell-Carrera et al., 2020).

Since 2006, the Landscape Architecture Accreditation Board (LAAB) has prioritized integration of sustainability principles into the knowledge, skills and competencies, emphasizing education for sustainable development as a key accreditation standard. The International Federation of Landscape Architects also underscores the importance of education for sustainable development in LA education to achieve sustainable development (Medina et al., 2022). The inclusion of education for sustainable development in LA curricula has become crucial for educating future landscape architects (Park et al., 2024). Marušić (2002) underscores fostering creativity, sustainable solutions and integrating landscape design, planning and nature conservation in the education, while Lenzholzer and Brown (2013) advocate for incorporating climate-responsive design courses into the LA education curricula. These efforts collectively aim to equip future landscape architects with the skills to address contemporary environmental and societal challenges.

The threshold learning outcomes of LA as identified by Lawson and Roy (2022), include the following categories: “Design and methods”, “Ecological and cultural systems”, “Technology and construction”, “Professional practice and ethics”, “Research graduate abilities and skills”, “Communication and collaboration”, “Visionary thinking”, “Continual learning graduate attributes”, “Interpersonal relationships (to be)”, and “Autonomy and responsibility”. These align with national accreditation criteria, comprising five points: 1. LA Theory and Methodology; 2. Planning, Design, and Management (including landscape planning, design, and management, urban open and green space planning and policy, cultural landscapes conservation and infrastructure planning and impact), 3. Structural and Plant Material (covering construction techniques and plant material and ecology); 4. Information Technologies in LA; and 5. Professional Practice. Addressing these outcomes can enhance LA education, boost students' confidence, and improve their professional attitudes.

The future of landscape architecture lies in creating sustainable, resilient, and inclusive landscapes to address contemporary environmental and social challenges. By embracing new technologies, advancing design approaches, and promoting the profession's value, landscape architects can help build a more sustainable and livable world (Marques, 2023). This will, of course, be achieved through education. Landscape architecture education will empower colleagues in the professional world to cope easily with the ever-changing problems.

Conclusion

The present research shows that women mostly prefer the LA department, and half of the students who preferred the department ranked high in the university entrance exam. Job-related factors were relevant to their preference, and it is evident that the students wished to work in the field they had chosen consciously and in which they were educated.

“The contribution of LA” and “professional competence and education” were the main factors behind the students' attitudes towards LA. The statements within the scope of LA's contribution had a high level of agreement. In contrast, the level of agreement with the items under professional competence and education was moderate. The spiritual and emotional dimensions of attitudes towards the job were assessed positively.

There was moderate agreement with the statement that the courses taken were adequate. However, the sufficiency of applied courses was rated at the lowest level. The students also had doubts about graduating with sufficient knowledge and experience, the relevance of their education to their professional lives, and the feeling of being ready to do their jobs at the end of their education. LA education should be improved by integrating applied professional studies into the education program. Similarly, as the students' order of preference for the department increased, so too did their positive perceptions about the contributions of LA and their professional enthusiasm. Students who preferred the profession at a higher level also had more positive attitudes towards the job. This highlights the importance and need for the promotion of the profession and increased efforts to inform society.

Students who chose LA because of job-related factors and who planned to work in LA-related jobs had higher positive perceptions. This shows that students with a career plan aligned with their professional education and their desire to choose the profession

had a more positive view of the job at the end of their education. This reinforces the importance of making conscious career choices and developing a career plan related to one's professional education.

The findings of the study suggest several potential practical applications that can enhance landscape architecture education and professional development. These applications can be categorized as follows:

(i) Curriculum Development: There is a need to enhance applied and technical courses to better prepare students for professional practice. Integrating more practice-oriented content will help bridge the gap between theoretical knowledge and sectoral requirements. Curricula should be updated for current issues, including technology, innovation and digital tools, the ability to be knowledgeable and able to produce solutions to the issues required by the age should be gained.

(ii) Career Counseling: Students who show a strong interest in Landscape Architecture (LA) should be guided toward aspects of the profession that highlight opportunities for personal growth and meaningful societal contributions. Educators should be encouraged to implement longitudinal mentoring programs and comprehensive career counseling services that nurture early career aspirations.

(iii) Professional Development Programs: To further cultivate a sustained interest and commitment toward the profession, continuous learning and skill development should be promoted among students. Targeted interventions—such as targeted workshops and internships—can foster deeper engagement and enhance long-term professional dedication.

(iv) Sector Collaboration: Collaborative projects with sector professionals are essential to provide real-world insights into working conditions, income expectations, and societal perceptions. Such initiatives will help align student expectations with actual sector realities, thereby facilitating a smoother transition from education to professional practice. Collaboration between academia, public and private sectors should be established and support should be provided from landscape architects working in the private and public sectors for practical issues in other courses, especially in studio courses.

(v) Student Recruitment Strategies: Recruitment efforts should focus on highlighting the personal attributes and the potential for making meaningful contributions to society through a career in LA. Promotional content that underscores these aspects can effectively attract prospective students to the field.

Integrating these strategies into the educational framework may not only enhance the overall quality of LA education but also ensure that graduates are well-equipped to meet the demands of the profession.

These applications of the research findings can be tailored to provide actionable steps for policymakers and university administrators. Accordingly, based on the study's findings, the following specific, actionable recommendations are proposed for decision makers and administrators in the field of Landscape Architecture (LA) (*Table 8*).

Table 8. Framework for improving landscape architecture education

Recommendation category	Specific action items
1. Enhance curriculum design and content evaluation	<ul style="list-style-type: none"> - Integrate applied professional practices more broadly into the curriculum - Regularly update course content through benchmarking against industry practices - Gather systematic feedback from students, alumni, and industry experts to ensure educational outcomes meet current professional requirements
2. Strengthen practical learning and	<ul style="list-style-type: none"> - Establish robust internship and fieldwork programs

Recommendation category	Specific action items
sector collaboration	<ul style="list-style-type: none">- Organize joint workshops, field activities, and seminars with industry professionals- Bridge the gap between academic learning and professional practice to boost student confidence
3. Enhance career counseling and mentorship	<ul style="list-style-type: none">- Provide comprehensive, focused career counseling services to guide informed decision-making and career trajectory planning- Develop mentorship programs that connect students with experienced professionals throughout their academic journey
4. Promote the profession and foster positive identity formation	<ul style="list-style-type: none">- Increase efforts to promote LA as a dynamic, impactful profession by emphasizing societal contributions and personal development opportunities- Tailor recruitment strategies to attract candidates with a strong intrinsic interest in LA, highlighting both technical and emotional rewards
5. Encourage multi-dimensional and interdisciplinary approaches	<ul style="list-style-type: none">- Develop curricula that expose students to diverse fields and sectors where LA is applicable- Foster interactions with international organizations and interdisciplinary networks- Align educational programs with global industry trends to enrich the learning experience

This structured suggestions provide a clear and organized approach for improving Landscape Architecture education in alignment with professional demands. These findings include insights into the future of the job and sector and LA education. The results of related educational studies must be integrated into the sector's future planning.

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