Article

Comparison of Forest Engineering Students' Attitudes towards Their Education and Future Jobs: Case Results from Turkey

Seçil Yurdakul Erol

Department of Forest Policy and Administration, Faculty of Forestry, Istanbul University-Cerrahpasa, Istanbul 34473, Turkey; secily@iuc.edu.tr

Abstract: Forestry is a complex multidimensional discipline that implies a broad job description and task variety for forest engineers. Thus, the scope of professional forestry education is expanding and diversifying. It is essential to determine the students' attitudes towards their education and future jobs to develop focused solutions in forestry education. In this context, the present study aims to analyze the attitudes of forest engineering students towards their education and future jobs. This study evaluated and compared the students' attitudes over a 10-year period through questionnaires administered to senior forest engineering students of the Faculty of Forestry at Istanbul University-Cerrahpasa (IUC). It was revealed that, during job selection, non-job factors (39.5%) were nearly as influential as job-related factors (53.7%). Moreover, students' career plans were based mainly on working in public institutions (41.4%) and simply doing their job (78.1%). The results showed that students' views on education have improved over time; however, they have doubts about their readiness to succeed in their careers ($M = 3.41$) and the adequacy of their knowledge and experience level ($M = 2.95$). Their attitudes on their future job were not wholly positive: They have doubts about finding a job ($M = 2.90$), having satisfactory working conditions ($M = 3.38$), and income ($M = 3.57$). The results of this study can support decision-making in forest education and human resources in forestry.

Keywords: forest engineering; forestry education; forestry education-related attitudes; job-related attitudes; human resources in forestry

Citation: Yurdakul Erol, S.

Comparison of Forest Engineering Students' Attitudes towards Their Education and Future Jobs: Case Results from Turkey. *Sustainability* **2022**, *14*, 530. <https://doi.org/10.3390/su14010530>

Academic Editors: Anna Zawadzka and Sharif Ahmed Mukul

Received: 16 November 2021

Accepted: 2 January 2022

Published: 4 January 2022

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Copyright: © 2022 by the author. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

The multidimensionality of forest functions, the increase in interest groups, and the diversity of forestry activities have increased the need for qualified human resources in the sector. Human resources working in the forestry sector are essential components of sustainable forest management, forestry organizations' success, forest resource utilization, new approach implementation, and the realization of forestry policy objectives [1–3]. Thus, forest professionals must be educated according to the requirements of the sector and the wide range of societal demands [4]. Forest engineering as a job deals with identifying and presenting solutions to problems that arise from the development of forest resources. The other activities that forest engineers deal with are planning, designing, implementing, and managing engineering projects that consider the protection of the public, ensuring employee safety, protecting the environment, and supporting sustainable forest management [5]. The career opportunities in forestry and natural resource management have been classified into 29 categories from resource management to human resources management, auditing, education, and database management [6]. The use of technology and innovations has also become a key part of forest engineering [7].

In this context, a forest engineer must (i) follow technological developments, (ii) have knowledge of international forestry, (iii) monitor community and employee management, (iv) holistically approach issues, problems, and solutions, (v) evaluate qualitative and quantitative data and establish cooperation, (vi) ensure and develop joint social responsibility,

(vii) sustain corporation governance (business management, economics, law), (viii) possess communication skills, (ix) lead, (x) solve complex problems and make decisions, (xi) think creatively, and (xii) understand and interpret public policy and social issues [8–11]. These essential features of professional forest engineering should also be part of education.

Suzuki [12] highlights the necessity of change in understanding forestry, namely the effect of deterioration and decline of forest resources worldwide, arguing that this should be at the core of 21st-century forestry education. In this context, forestry education is diverse due to the changing role of the forest sector; forestry education needs to be improved through public administration, technical management, and knowledge creation, while adjusting to changing societal demands [13]. Spinelli et al. [14] mention that forest engineering has a local diversification in terms of education and, in general, the discipline requires comprehensive knowledge of ecology, environmental impacts, occupational safety, and management besides engineering and forestry subjects. Furthermore, the needs of addressing complex multidisciplinary problems lead to an extension of forestry education through multidisciplinary and interdisciplinarity that includes soil sciences, wildlife, economy, ecology, agriculture, environmental sciences, outdoor recreation, the forest industry, sociology, pasture management, watershed management, nature protection, participatory management, land use planning, and genetics [15–17].

The context and priorities of forestry education can be changed according to the region or country. The case of Ghana, as reported by Ameyaw et al. [18], emphasizes the need to improve non-technical capabilities of forest engineers beyond technical knowledge to improve forest governance in the country; in this context, key capabilities include leadership, authority and autonomy, initiating and managing change, and addressing governance challenges. Furthermore, in Spain, forest engineering education has reflected the economic, social, political, and technological developments in the historical process. The content of education broadened from natural life sciences to complex programs focusing on technology, environmental requirements, improving employability, competitiveness, and global acceptance [19]. In South Africa, the privatization strategy and the change in public and private forestry affect the demand of forestry skills with new social, economic, and industrial expectations to serve the industry and improve forestry education [20]. The applicants for traditional university-level forestry education declined while a multidisciplinary educational program that includes forestry became more popular in England. However, this situation causes concerns about the decline in education for integrated resource management in the country [21]. In Japan, the structure of society and reform of the national university system led to forestry education changing its focus from “forest science” to “forest resources science”. In this context, the forest curricula were broadened to cover more than forestry and the universities strengthened environmental studies [22]. In the Philippines, the focus of sustainable forest management directed both academic programs and institutional structures of forestry education. The role of forest professionals changed from being technical experts and forestry authorities who manage forests by themselves to technical experts and social practitioners, leaders, and partners of forest management; that change had a direct impact on forest education [23].

From the perspective of Turkey, the initial purpose of forestry education was focused on establishing human resources for the forestry organization. For this purpose, the first forest school in Turkey was established in 1857 by the initiative of Louis Tassy [24,25]. The status and name of the school were changed over time. The Forestry High School was established in 1910; forestry education was further refined during the republican period, turned into a faculty in 1934, and affiliated to Istanbul University in 1948 [26]. The function of forest faculties is no longer limited to training human resources for the forestry organization; the contemporary mission of forest education institutes for Turkey is addressed by Yurdakul Erol and Şahin [27] as (i) education and teaching, (ii) research and knowledge generation, (iii) raising awareness and serving the community, (iv) training a qualified workforce, (v) supporting forestry-related implementations, (vi) training researchers, (vii) ensuring institutional development, (viii) influencing the development of relevant sectoral policies,

(ix) contributing to the solution mechanisms for country-level problems and science, and (x) following and contributing to international processes.

The Law on Forest Engineering, Forest Industry Engineering, and Wood-Based Industrial Engineering (Law No. 5531, enacted in 2006) comprehensively defined the working area of forest engineering. In this context, the scope of forest engineering includes activities on (i) natural and artificial forests, (ii) energy forests, (iii) seed production and grafting, (iv) seed and tree improvement, (v) forest nurseries, (vi) combatting erosion and controlling floods and avalanches, (vii) watershed management and rural development, (viii) pastures in or near forests, (ix) game and wildlife in forests, (x) water resources in forests, (xi) national parks and recreational areas, (xii) landscape planning, (xiii) forest borders and ownership, (xiv) forest fires and forest protection, (xv) forest ecosystems and genetic reserves, (xvi) urban forestry, forest environment planning, and environmental impact assessment, and (xvii) flora and fauna in forest ecosystems. The same law defined standards for forest engineers regarding research and development, environmental accounting, valuation, cost determination, conducting a feasibility study, design, standardization, certification, quality control, inventory control, planning and preparation of project and report, auditing, consultation, and operations on importing and exporting. This law expanded the working area, tasks, and responsibilities of forest engineers in the country and also broadened the scope of forestry education [28].

The forest engineers who have a broad field of tasks and responsibilities have to gain equally broad abilities and knowledge; therefore, work in a multidisciplinary field should be well-planned, and a well-organized education system should be implemented [29]. Besides, higher education institutions are responsible for shaping students' values and attitudes to prepare them for their future professional careers [30]. Sarnesova et al. [31] highlight that universities' efforts that focus on the professional motivation of the students positively affect the students, and their interest in the chosen profession increases. The broad task definition of forestry engineers and their responsibilities as natural resource managers on global, national, and local scales make occupational love and motivation more critical. The love and awareness of the profession of forest engineers are of great importance in terms of successfully and continuously fulfilling this responsibility in their professional lives.

Undoubtedly, the process of receiving occupational education is influential in shaping attitudes, views, and interests towards the profession; in this period, individuals are able to both learn their job and make plans and decisions regarding their professional lives. Within the specified framework, it is vital to consider the opinions of forest engineering candidates about their profession. In the focus of forestry in Turkey, this approach becomes even more critical. Generally, forest-related jobs are seen as "difficult, dangerous and dirty" [32]. Further, the low recognition of forest engineering departments and job-finding problems [33] in Turkey leads to a lower preference for the relevant department in high school graduates.

Under these circumstances, it is vital to determine the attitudes of forest engineering students to identify the problems and set future strategies in terms of forest engineering education. These efforts can also improve perceptions of the job and social interest in forestry. In this context, the study aims to analyze the attitudes of forest engineering students towards their education and future careers. The results of this research help to compare students' views over a ten-year period, support decisions that will positively impact the related processes, and focus on solutions that will increase the interest and love of students towards their profession.

2. Material and Method

In the first stage of the study, the sample case was selected as Istanbul University-Cerrahpasa (IUC), Faculty of Forestry, Department of Forest Engineering. This university was chosen because it is the oldest forest education institution in Turkey, with 164 years of history (since 1857); it also has a high number of students and was the first accredited

forest engineering department in Turkey. IUC has also been the most preferred in the university entrance exam among forest engineering departments [34]. After the case was selected, the questionnaires were administered to senior students (students in their last year of education), and the resulting data were analyzed. Senior students were chosen because they are in the last stage of their undergraduate education; thus, they should have enough experience and knowledge to evaluate the educational process. They are also expected to have made an individual career plan and determined the trends related to their professional life in general.

The questionnaire was administered over 10 years with a total sample of 927 students. The main features of these students are shown in Table 1, indicating the type of high school attended before university, gender, rank of preference in the university entrance exam (* After graduation from high school in Turkey, the students who wish to continue their education take the “university entrance exam”. Students rank the programs in which they would like to enroll and placement is made according to their exam scores. “Rank of preference in the university entrance exam” in this study concerns how the students ranked the forest engineering department, categorized as “high”, “medium” and “low”.), and the period of their studentship. The students’ reasons for choosing the forest engineering department and planned working area and sector were also assessed (Table 2). The questionnaire consisted of two groups of questions. The first group comprised 15 questions about evaluating the adequacy of lessons, educational system, and contribution of education to future job readiness. The second group assessed the students’ expectations and attitudes on the job through 23 statements. The questions in the first and second parts of the questionnaire were presented to the participants using a five-point interval scale in which a value of 5 corresponded to “strongly agree,” and a value of 1 corresponded to “strongly disagree”.

Table 1. Frequency and percentage of students that completed the questionnaire in terms of their general features.

Features of Students		N (Frequency)	% (Percentage)
Graduated high school (HS)	Public HS	405	43.7
	Anatolian HS	318	34.3
	Vocational HS	59	6.4
	Private HS	33	3.6
	Other	103	11.1
	No response	9	1.0
Gender	Female	350	37.8
	Male	574	61.9
	No response	3	0.3
Rank of preference in the university entrance exam	High-level	573	61.8
	Medium-level	108	11.7
	Low-level	178	19.2
	No response	68	6.7
Period of studentship	2010–2013 (before accreditation)	335	36.1
	2014–2017	379	40.9
	2018–2021	213	23.0

Table 2. The reasons for choosing the department and the planned working area and sector.

Features of Student		N (Frequency)	% (Percentage)
The reason for choosing a forest engineering department	Job-related factors	498	53.7
	Non-job related factors	366	39.5
	Job and non-job-related factors	63	6.8
Planned working area	Forest engineering related jobs	724	78.1
	Jobs except forest engineering	127	13.7
	Both of them	76	8.2
Planned working sector	Public institutions	384	41.4
	Private enterprises	76	8.2
	Academic works	89	9.6
	Starting own business	106	11.4
	Multiple choice	272	29.3

The responses were analyzed using the Statistical Package for the Social Sciences (SPSS), manufactured by IBM, USA. In the first stage, Cronbach's alpha (α) reliability analysis was conducted to assess the scale's reliability and estimate the correlation coefficient. The estimates of α for the question of the last two groups were $\alpha = 0.82$ and $\alpha = 0.91$, respectively. The results revealed that the question groups had high reliability. Moreover, the Spearman correlation test was used to measure the statistical dependence and relations between the variables of students' features and the reason for choosing the forest engineering department, planned working area, and sector. The differences between the evaluation of the students were further analyzed by ANOVA and a *t*-test. These comparisons were made based on the categories indicated in Table 1. The evaluations were made according to the significance levels (*p*) 0.01 and 0.05.

3. Results

3.1. Assessment of the Students' Reasons for Choosing the Forest Engineering Department and Students' Plans on Their Future Working Area and Sector Preference

According to the respondents, the primary factors for choosing the department are job-related ($N = 498$, 53.7%) (Table 2). These factors include "being influenced from people doing the job" (33.8%), "being interested in nature-related jobs" (31.7%), "loving the job" (30.4%), and "being the ideal job" (4.1%). However, non-job-related reasons are also important for the students' decision ($N = 366$, 39.5%) (Table 2). These factors include "requiring a low score at university exam" (28.6%), "family guidance" (26.9%), "not to stay idle" (21.1%), "living away from home" (10.5%), "enrolling in an undergraduate program" (9.2%), and "to postpone military service" (2.8%). Some of the students mentioned that they were influenced by both job-related and other factors ($N = 63$, 6.8%).

The participants were also asked about their plans for the working area and sector. It is important to note that the majority of the students plan to work in jobs related to forest engineering ($N = 724$, 78.1%) and most of them plan to work in public institutions ($N = 384$, 41.4%) (Table 2). The option for multiple choices ($N = 272$, 29.3%) or starting their own business ($N = 106$, 11.4%) were also popular (Table 2).

There was a correlation between those who graduated high school and the planned working area ($r = 0.07$, $p = 0.05$) (Table 3). The students who graduated from vocational high schools and public high schools planned to work in forest engineering-related jobs at a high frequency. The correlation results also show that gender is relevant in choosing the working area ($r = 0.11$, $p = 0.0$). Female students' inclination to work in the field of forestry engineering is higher than the males'. Furthermore, the rank of preference of the department in the exam correlated with students' reasons for their job selection ($r = 0.13$, $p = 0.0$) and planned working sector ($r = 0.08$, $p = 0.01$); students who ranked the department at a high or medium level were influenced more by job-related factors than those who ranked the department lower. The latter was also concerned more with non-job related factors. This relationship is also related to the period of studentship and department

selection reason ($r = -0.10$, $p = 0.0$). The correlation between the reason for department choice and job-related factors increases over time.

Table 3. Correlation between students' features and reasons for choosing the department, planned working area, and sector.

		Graduated High School (HS)	Gender	Rank of Preference in University Exam	Period of Studentship
Reason for choosing forest engineering department	r	0.03	0.01	0.13 **	0.10 **
	p	0.34	0.56	0.00	0.00
Planned working area	r	0.07 *	0.11 **	0.05	0.01
	p	0.05	0.00	0.12	0.92
Planned working sector	r	0.05	-0.05	0.08 *	0.01
	p	0.10	0.10	0.01	0.84

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).

3.2. Assessment of Students' Evaluation of Courses and Education

The participants were asked how they considered the adequacy of lessons and the education system. They indicated that the courses in the program are necessary for their profession in general ($M = 3.94$); however, they were not entirely sure about the sufficiency of the courses ($M = 3.08$). For the students, the courses on biological-ecological ($M = 4.22$), technical ($M = 4.10$), and socio-economic ($M = 3.95$) sciences were important. They considered the courses' sufficiency in all categories satisfactory. They thought the theoretical courses' sufficiency was moderate ($M = 3.25$) and applied courses were generally low ($M = 2.75$). The findings show that the participants considered appreciated the courses ($M = 3.85$) and internships ($M = 3.56$) in terms of adaptation to the future job and vocational education. However, they do not feel totally ready to do the job ($M = 3.41$) and doubt the adequacy of their knowledge and experience level to do the job ($M = 2.95$). Based on ANOVA results, there were statistically significant differences among students from different high schools regarding the adequacy of the courses in socio-economic ($p = 0.03$, $F = 2.53$) and biological-ecological sciences ($p = 0.01$, $F = 3.26$), as well as applied courses ($p = 0.00$, $F = 4.14$) (Table 4).

Gender was a key factor for respondents' assessment of the necessity of courses in terms of their professional background ($p = 0.00$, $t = 5.03$), importance of lessons on social-economic ($p = 0.00$, $t = 2.81$), biological-ecological ($p = 0.00$, $t = 4.33$), and technical ($p = 0.00$, $t = 5.03$) courses, sufficiency of lessons on biological-ecological ($p = 0.00$, $t = 2.77$) and technical ($p = 0.01$, $t = 2.50$) courses, and the effect of education on job adaptation ($p = 0.00$, $t = 5.03$). Female students highly agreed with the statements, with the exception of the adequacy of biological-ecological and technical courses. The participants' assessment of the adequacy of courses on technical sciences ($p = 0.00$, $F = 5.17$), applied courses ($p = 0.02$, $F = 3.47$), and graduating with sufficient knowledge and experience ($p = 0.02$, $F = 3.81$) corresponded to their ranking of preference in the university exam.

The period of studentship is the variable that causes the highest difference between expressions. The sufficiency of their education for professional life ($p = 0.00$, $F = 12.67$), the adequacy of courses on social-economic ($p = 0.00$, $t = 7.52$), biological-ecological ($p = 0.00$, $t = 11.91$), and technical ($p = 0.00$, $t = 15.32$) sciences, and theoretical ($p = 0.00$, $F = 4.71$) and applied courses ($p = 0.00$, $F = 21.92$) corresponded most with the period of studentship. This variable also leads to differences in students' belief that they will graduate with sufficient knowledge and experience ($p = 0.02$, $F = 3.85$) and their feeling of readiness to do the job ($p = 0.01$, $F = 4.13$). During the 10-year period, respondents' agreement with these statements relating to courses and education gradually increased (Table 4).

Table 4. Assessment of courses and education of forest engineering department students.

Expression	Graduated High School (HS)					Gender		The Rank of Pref. in the University Entrance Exam			Period of Studentship		
	Public HS	Anatolian HS	Vocational HS	Private HS	Other	Female	Male	High-Level	Medium-Level	Low-Level	2010–2013	2014–2017	2018–2021
In general, the courses I take are professionally necessary.	3.97	3.89	3.93	3.91	4.00	4.11 $p = 0.00-t = 5.03$	3.84	3.97	3.65	3.90	3.91	3.97	3.93
In general, I believe that the education I have received will be sufficient for my professional life.	3.06	3.12	3.39	3.00	2.95	3.05	3.10	3.11	2.86	3.06	2.87 $p = 0.00-F = 12.67$	3.14	3.30
The courses I take in social-economic sciences are essential for my profession.	4.04	3.90	3.93	3.82	3.86	4.10 $p = 0.00-t = 2.81$	3.86	4.01	3.92	3.83	3.98	3.91	3.98
The courses I have taken in the field of social-economic sciences are sufficient.	3.38	3.53	3.56	3.69	3.30	3.51	3.41	3.48	3.32	3.40	3.33 $p = 0.00-F = 7.52$	3.43	3.65
The courses I take on biological-ecological sciences are important for my profession.	4.22	4.23	4.25	4.13	4.24	4.37 $p = 0.00-t = 4.33$	4.13	4.27	4.27	4.13	4.22	4.17	4.32
The courses I have taken in the field of biological-ecological sciences are sufficient.	3.58	3.72	3.77	3.33	3.42	3.49 $p = 0.00-t = -2.77$	3.68	3.65	3.45	3.56	3.42 $p = 0.00-F = 11.91$	3.66	3.81
The courses I take in technical sciences are essential for my profession.	4.16	4.04	4.19	3.94	4.05	4.29 $p = 0.00-t = 5.20$	3.99	4.10	4.19	4.08	4.14	4.08	4.08
The courses I take in the field of technical sciences are sufficient.	3.15	3.33	3.31	3.15	3.09	3.10 $p = 0.01-t = -2.50$	3.28	3.25	2.89	3.20	2.97 $p = 0.00-F = 15.32$	3.28	3.46
The majority of courses I have taken can be used in my occupational life.	3.22	3.18	3.27	3.33	3.13	3.24	3.17	3.23	3.07	3.22	3.08	3.24	3.31
The education I received will help me adapt to my future job.	3.86	3.81	3.81	4.03	3.92	3.93 $p = 0.00-t = 5.03$	3.80	3.88	3.76	3.89	3.88	3.78	3.94
The internships have contributed to my vocational education.	3.49	3.73	3.73	3.45	3.52	3.53	3.63	3.59	3.61	3.55	3.48	3.68	3.59
The theoretical courses are sufficient.	3.18	3.33	3.41	3.16	3.20	3.22	3.27	3.28	3.10	3.27	3.17 $p = 0.00-F = 4.71$	3.22	3.44
The applied courses are sufficient.	2.65	2.90	3.03	2.79	2.56	2.67	2.80	2.81	2.52	2.67	2.45 $p = 0.00-F = 21.92$	2.87	3.01
I believe that I will graduate with sufficient knowledge and experience.	2.93	2.99	3.03	2.88	2.88	2.93	2.96	2.99	2.68	2.91	2.83 $p = 0.02-F = 3.85$	2.97	3.08
At the end of my educational period, I feel ready to do my job.	3.06	3.22	3.41	3.00	3.12	3.06	3.19	3.15	2.95	3.15	3.07 $p = 0.01-F = 4.13$	3.10	3.32

3.3. Assessment of Students' Evaluation on Their Future Job

Overall, these findings illustrate that forest engineering was not the job that the students always wanted to do ($M = 2.32$). Students also mentioned that they did not wholly find themselves suitable for their future job at the beginning of their education ($M = 3.50$). However, their feelings of suitability increased by the end of their education ($M = 3.92$). They also indicated that their opinions about the job were at a moderate level ($M = 3.59$), and it was positively changed by the effect of vocational education ($M = 3.99$). Yet, they did not wholly believe in themselves using vocational methods and techniques ($M = 3.41$).

The most significant concerns about the job related to the feeling of being beneficial to society ($M = 4.28$), although the students believed that they would be happy doing their jobs ($M = 4.03$). According to the participants, their future job will positively contribute to their personality ($M = 3.99$) and the spiritual satisfaction level of the job will be high ($M = 3.94$). They were also honored to have chosen forest engineering as their job ($M = 3.97$). However, the students did not qualify the job as a popular one ($M = 2.52$) and did not believe they would find a job after graduation ($M = 2.90$) or that the working conditions would be good ($M = 3.38$). They also expressed doubts about the positive image of the job in society ($M = 3.24$), their satisfaction with the level of income ($M = 3.57$), and the job's contribution to their social lives ($M = 3.68$). It was revealed that the students did not consider their jobs as ideal ($M = 3.61$) and did not wholly believe the popularity of the job will increase ($M = 3.61$). The level of students' willingness to obtain a university education in forest engineering is moderate if they were to retake the university exam ($M = 3.17$). They mentioned they were not entirely sure whether they would recommend the department to people around them ($M = 3.50$).

In terms of graduating high school, ANOVA test results revealed significant differences among students' attitudes about the popularity of forest engineering as a job ($p = 0.04$, $F = 2.45$) and finding a job after graduation ($p = 0.00$, $F = 3.78$). Gender also had an impact on attitudes regarding the job, contributing to statistically significant differences about changing the thought about the job after education ($p = 0.00$, $t = 2.94$), feeling honored to have chosen the job ($p = 0.00$, $t = 4.06$), the positive contribution of the job to one's personality ($p = 0.00$, $t = 2.72$), and feeling beneficial to society ($p = 0.00$, $t = 2.85$). Female students were generally more in agreement with these statements than their male counterparts. Conversely, male students were more in agreement with statements on the popularity of the job ($p = 0.03$, $t = 2.17$), positive opinion about the job before choosing the department ($p = 0.00$, $t = 2.65$), viewing the job as what they have always wanted to do ($p = 0.00$, $t = 3.10$), and belief that they will have good working conditions ($p = 0.01$, $t = 2.37$) (Table 5).

There were also significant variations between the students who ranked their "preference in the university entrance exam" differently. Finding oneself suited to the forest engineering department ($p = 0.00$, $F = 7.56$), holding a positive opinion about the job before choosing the department ($p = 0.00$, $F = 19.19$), considering the job as what they have always wanted to do ($p = 0.00$, $t = 11.70$), and feeling honored to have selected the job ($p = 0.01$, $t = 4.06$) are among the statements that were affected. Considering the job as an ideal one ($p = 0.00$, $t = 7.16$), viewing the job's contribution to personality as positive ($p = 0.00$, $t = 4.06$), achieving spiritual satisfaction with the job ($p = 0.02$, $F = 3.57$), gaining prestige in society ($p = 0.01$, $F = 4.48$), and willingness to receive university education in forest engineering if they were to retake the university exam ($p = 0.03$, $F = 3.27$) were similarly affected by variations in the department ranking. It is important to note that students who ranked the forest engineering department highly also expressed greater agreement with the above statements.

Table 5. Assessment of forest engineering department students' attitudes on their future job.

Expression	Graduated Highschool (HS)					Gender		The Rank of Pref. in the University Entrance Exam			Period of Studentship		
	Public HS	Anatolian HS	Vocational HS	Private HS	Other	Female	Male	High-Level	Medium-Level	Low-Level	2010–2013	2014–2017	2018–2021
At the beginning of my education, I found myself suited for forest engineering program.	3.47	3.54	3.69	3.41	3.41	3.42	3.56	3.60	3.44	3.24	3.36	3.62	3.52
								$p = 0.00-F = 7.56$			$p = 0.00-F = 5.04$		
I consider forest engineering suitable for me at the end of my education.	3.91	3.90	3.98	3.91	3.98	3.96	3.89	3.96	3.87	3.86	3.90	3.96	3.86
Before choosing this department, my opinion about the job was positive.	3.58	3.59	3.72	3.72	3.47	3.47	3.66	3.72	3.45	3.18	3.44	3.64	3.72
						$p = 0.00-t = -2.65$		$p = 0.00-F = 19.19$			$p = 0.00-F = 5.37$		
After I started to study in this department, my thoughts about forest engineering became/remained positive.	4.01	3.94	3.86	3.97	4.18	4.11	3.92	4.01	4.07	3.95	4.09	3.93	3.96
						$p = 0.00-t = 2.94$							
Forest engineering is the job I wanted to do.	2.27	2.39	2.36	2.31	2.29	2.18	2.41	2.43	2.02	2.07	2.18	2.47	2.27
						$p = 0.00-t = -3.10$		$p = 0.00-F = 11.70$			$p = 0.00-F = 6.09$		
I feel I can use professional methods and techniques effectively.	3.36	3.46	3.67	3.39	3.33	3.34	3.44	3.45	3.31	3.30	3.30	3.43	3.53
						$p = 0.00-t = 3.45$					$p = 0.01-F = 4.01$		
I am honored to have chosen forest engineering.	3.96	3.92	4.16	4.00	4.02	4.06	3.91	4.02	3.76	3.90	3.90	3.99	4.02
						$p = 0.02-t = 2.32$		$p = 0.01-F = 4.06$					
I am confident that I will do my job well.	4.11	4.12	4.20	3.84	4.04	4.13	4.08	4.11	4.09	4.08	4.04	4.08	4.23
											$p = 0.04-F = 3.12$		
The image of forest engineering is positive in society.	3.31	3.27	2.98	3.19	3.12	3.24	3.24	3.28	3.30	3.09	3.31	3.12	3.32
The income level of forest engineering is satisfactory.	3.61	3.57	3.74	3.31	3.41	3.60	3.54	3.61	3.48	3.45	3.44	3.70	3.52
											$p = 0.00-F = 6.83$		
Forest engineering is an ideal job.	3.60	3.63	3.62	3.61	3.60	3.54	3.65	3.69	3.35	3.49	3.56	3.65	3.63
								$p = 0.00-F = 7.16$					
Forest engineering will positively affect my social life.	3.66	3.63	3.81	3.56	3.90	3.73	3.64	3.72	3.68	3.51	3.52	3.74	3.81
											$p = 0.00-F = 6.17$		
I think that my job will make a positive contribution to my personality.	3.98	3.95	4.02	3.97	4.18	4.08	3.93	4.04	3.97	3.84	3.89	4.01	4.10
						$p = 0.00-t = 2.72$		$p = 0.00-F = 15.45$			$p = 0.01-F = 4.19$		
I feel that I will be helpful to society by doing my job.	4.27	4.26	4.36	4.22	4.38	4.37	4.23	4.32	4.21	4.23	4.21	4.26	4.43
						$p = 0.00-t = 2.85$					$p = 0.00-F = 5.59$		

Table 5. Cont.

Expression	Graduated Highschool (HS)					Gender		The Rank of Pref. in the University Entrance Exam			Period of Studentship		
	Public HS	Anatolian HS	Vocational HS	Private HS	Other	Female	Male	High-Level	Medium-Level	Low-Level	2010–2013	2014–2017	2018–2021
I believe that the working conditions for my job will be good.	3.36	3.38	3.64	3.29	3.29	3.28 $p = 0.01-t = -2.37$	3.43	3.40	3.36	3.24	3.27 $p = 0.01-F = 4.27$	3.38	3.52
I believe the spiritual satisfaction of my field is high.	3.94	3.90	3.98	4.16	3.97	3.97	3.92	4.00 $p = 0.02-F = 3.57$	3.81	3.81	3.86 $p = 0.03-F = 3.36$	3.93	4.08
My field is a popular one.	2.62	2.43	2.26 $p = 0.04-F = 2.45$	2.69	2.52	2.42 $p = 0.03-t = -2.17$	2.58	2.52	2.44	2.54	2.66 $p = 0.00-F = 9.46$	2.55	2.25
I believe my profession will become more popular in the future.	3.59	3.57	3.59	3.88	3.76	3.61	3.61	3.59	3.67	3.62	3.80 $p = 0.00-F = 7.03$	3.47	3.56
I believe I can find a job after graduation.	2.85	2.85	2.66 $p = 0.00-F = 3.78$	3.22	3.24	2.87	2.91	2.90	2.71	2.88	3.22 $p = 0.00-F = 21.45$	2.68	2.77
Doing my job will make me happy.	4.05	3.99	4.14	3.97	4.03	4.09	4.00	4.08	3.95	3.97	3.97	4.06	4.08
My job will give me prestige in society.	3.93	3.90	3.90	3.78	3.87	3.95	3.87	3.98 $p = 0.01-F = 4.48$	3.81	3.76	3.86	3.88	4.03
If I took the exam again, I would like to choose this department again.	3.14	3.12	3.32	3.28	3.30	3.24	3.12	3.23 $p = 0.03-F = 3.27$	3.02	2.97	3.22	3.14	3.13
I would recommend my field to those around me.	3.47	3.47	3.46	3.63	3.70	3.59	3.45	3.56	3.34	3.40	3.60	3.40	3.53

The period of studentship is another independent variable that caused differences among the participants' evaluation of their future job. These expressions include finding oneself suited to the forest engineering department ($p = 0.00$, $F = 5.04$), having a positive opinion about the job before choosing the department ($p = 0.00$, $F = 5.37$), considering the job as what they have always wanted to do ($p = 0.00$, $t = 6.09$), and feeling ready to use professional methods and techniques ($p = 0.01$, $F = 4.01$). Additional statements include feeling confident about doing the job ($p = 0.04$, $F = 3.12$), being satisfied with the level of income ($p = 0.00$, $F = 6.17$), having good working conditions ($p = 0.01$, $F = 4.27$), viewing the job's contribution to personality as positive ($p = 0.01$, $F = 4.19$), and feeling beneficial to society ($p = 0.00$, $F = 5.59$). Further, the period of studentship also appears to have influenced the students' spiritual satisfaction with the job ($p = 0.03$, $F = 3.36$), the popularity of the job ($p = 0.00$, $F = 9.46$), the job's future popularity ($p = 0.00$, $F = 7.03$), and the likelihood of finding a job after graduation ($p = 0.00$, $F = 21.45$) (Table 5).

4. Discussion

Forest engineering combines the characteristics of both natural resources-related jobs and engineering. Thus, students must graduate with sufficient knowledge and experience relating to forestry and engineering. From a broad perspective, the forestry discipline has direct and indirect relationships with many other fields, from public relations to technology. The overall context of forest engineering presents some difficulties both in the education process and in professional business life after graduation [29]. From this point of view, it is evident that the individuals' interest, love, and attitude about their education and future job will affect whether they overcome these difficulties and become successful in the education process and their career. Overcoming these difficulties and being successful in one's educational and professional careers are directly related to individuals' fondness for the department and interest and attitude towards the profession.

The main problems regarding forest engineering education in Turkey are (i) the high number of forest engineering departments and high student quotas, (ii) a lack of qualified students, (iii) the requirement of low university entrance scores, which leads to the acceptance of students with low motivation, (iv) the gap between human resources demands and supply, which leads to unemployment of the graduated students, (v) insufficient efforts for relationships between faculties and other forestry organizations, (vi) a high number of courses with inadequate content and insufficient curriculum updates, (vii) the absence of specialization and lack of encouraging postgraduate education, (viii) inadequate experience, internships, and applied knowledge of the students, and (ix) insufficient promotion among the public [35–37].

These country-level problems more clearly demonstrate the importance of the issue. Undoubtedly, these aspects involve the whole of Turkish forestry education. However, IUC Faculty of Forestry, Department of Forest Engineering represents a typical case for the country and can be the pioneer to identify general problems. The profile of the students is important in this context; Toksoy et al. [38] state that the socio-economic characteristics of the students who will graduate as forest engineers may affect the education process of the students and their professional competencies later on. The students from public high schools and male students tend to prefer the forest engineering department more than their peers; as Arslantaş [39] demonstrates, this has led to fewer female students and engineers in educational and forestry organizations in Turkey. A similar case in Sweden also reflects a low ratio of female students and points out the need to increase the attractiveness of forestry sciences for women [40]. Grubbström and Powell [41] express the need for more gender-equal forestry education and its positive effect on attracting students to forest science programs.

Although the most influential factors in choosing the department were those related to the job, it was noted that non-job factors were also important. Being influenced by people doing the job, being interested in nature-related jobs, and loving the job are of the highest importance. The most agreed-upon non-job factors concerned the requirement of a low

entrance exam score, family guidance, and the desire to not stay idle. The IUC case shows that the number of students who define the job as ideal is very low. Further, the students did not respond positively to statements on job desirability, willingness to enter forest engineering at university if they were to retake the university exam again, and whether they would recommend the department to people around them; these prove that their attitudes about the forest engineering department are not wholly positive. A similar case in Austria also proves that adverse community perception is the main factor affecting rejection or not choosing the department as a profession [42]. Searle and Bryant [42] illustrate that experience in resource management and acquaintance with forestry professionals and the forestry and environment-related factors affect the choice of a career in forestry. These results reveal the need for adequate public relations studies regarding knowledge and awareness of forest engineering. Raising awareness about the job and informing young people about the profession will increase the number of students who wish to pursue forest engineering.

Most of the students planned to work on jobs relating to forest engineering in public institutions. Arevola et al. [43] showed that management of public forests is the primary career goal of forest engineering students from Brazil, China, and Finland. However, the present study shows that students in Turkey do not believe they can find a job after graduation and work in good conditions. It was also seen that the students did not have an entirely positive perspective on the potential income level or the impact on their social life. Other research on attitudes of forest engineering students in Turkey shows they are happy to be forest engineers, plan to work in a public forestry institution, and believe they can find a job in a medium-term period, but are not wholly hopeful about the future potential of the job [44]. Even so, the survey conducted by Türker [45] showed that forest engineering students think that Turkey's forestry is deteriorating and that it is possible to at least partially solve these problems of the country's forestry. This approach may lead students and engineers to develop a negative attitude about the job. As a result of developments in travel, communication, and access to global information, working opportunities in the international market are developing, and forest engineers can benefit from working abroad [46]. This approach should be considered as an alternative to in-country work as it increases job opportunities. Further, forestry constitutes a "green job" in seven main fields: (i) Wood and energy, (ii) agroforestry and mountain forestry, (iii) social and urban development, (iv) forest management, inventory, and planning, (v) biodiversity and ecosystem function, (vi) health and recreation, and (vii) education and research [47]. This potential should be highlighted in future job opportunities to increase the popularity of the field. It is necessary to be internationally accredited, integrate the main principles of the Bologna process into forestry education more effectively, and take a more active role in international student and lecturer exchange programs to keep the employment potential of graduates high [48].

Respondents generally agreed that people will benefit society through the forestry profession, they see it as a job with moral satisfaction, and their career will gain prestige in the community. A contrasting view about the popularity and perception of the job could decrease morale and motivation regarding education and occupational life. Šušnjar et al. [49] demonstrate that employment problems are among the most significant issues of forest education, students have lost interest in academic forestry programs, and there is a weak link between forestry practice and higher forestry education. Gümüş [50] suggests that unemployment further decreases the motivation of students. In general, students who did well in high school do not prefer the forest engineering track; as a result, the department mainly attracts students with low scores. That has a direct relation with the quality and mental status of the students. Improving the employment opportunities for forest engineers in the private sector and supporting their capacities for curricula revisions, internships, and certificate programs will contribute to solution mechanisms [51]. Solutions can also be found, according to Korkmaz and Duman [52], through improving career-related studies; organizing meetings with professionals in the field, coaching the students in career

planning, and better planning for the career areas with course curricula all contribute to students' motivation for forest engineering. Supporting graduate education could be another way to promote the capacity, ability, and qualifications of the graduates. As O'Hara and Salwasser [53] demonstrate, research universities' perspective on forestry education focuses on a science-driven education that develops innovation and problem-solving skills. As a research university, IUC could improve both the research capacity and the quality of its graduates in terms of their contribution to the sector and competitiveness in forestry. This approach can also raise the standard of forestry education throughout the country.

The level of self-confidence for the job and the possibility of a future career improved through the education process. However, the students' beliefs about using vocational methods and techniques are currently inadequate. Kostilainen [54] stresses the need for the comprehensive preparation of future professionals and the necessity to increase the competitiveness among other sectors in the same labor market. In this context, Pelkonen [55] highlights the influence of agriculture, environment, and energy policies on forestry education and mentions the need for active cooperation between forestry and forestry-related sciences.

The students' attitudes related to their education and future job increased over the ten-year period. Their attitude towards (i) the sufficiency of education in general, (ii) courses on socio-economic sciences, biological-economic sciences, and technical sciences, and (iii) theoretical courses and applied courses also increased over time. Moreover, the number of students whose opinion was positive before choosing the department increased. The feeling about using professional methods, self-confidence about doing the job, the effect of the job on one's social life, and the positive contribution of the job to personality similarly improved. Other factors that improved over the ten-year period are the job's contribution to society, the future working conditions, and spiritual satisfaction with the job. The most dramatic decrease in the students' attitudes concerned the current and future popularity of forest engineering and the likelihood of finding a job after graduation. However, all statements regarding the educational system saw positive change; improvements could still be made to public relations activities and cooperation with forestry-related institutions at the national and international level.

The students believe in the necessity of courses on biological-ecological, technical, and socio-economic sciences, and they considered these courses to be moderately sufficient. Technical courses were assessed as the most insufficient lessons. The applied courses were also determined to be inadequate, and internships were viewed as average. Reflecting these findings, multi-national research on forestry education has revealed students' interest in environmental issues and field studies is high, but that they do not feel ready to do the job at the end of their vocational education and are not sure about the adequacy of their knowledge and experience [43]. The research of Erdönmez et al. [56] on the approaches of graduated forest engineers showed that the biological and technical sciences courses should be improved to increase vocational preparation. Forest engineers generally viewed the socio-economic sciences (public relations, law, economy, sociology, and communication) as very important [56]. A similar study in South Africa also testifies to the need for human and business management skills combined with technical and legal issues for future foresters [57]. In Laos, research shows that the main competencies for forestry professionals include comprehensive forest management, advanced forest planning technology, field skills, problem-solving, and social relations [58].

The research on innovations in forest education also expresses the importance of leadership, administration, public relations, and communication skills in forestry education curricula; these should integrate some innovative techniques such as critical thinking, practical experience, creativity, problem-based learning, and building cooperation [59]. Bullard [60] emphasizes the growing importance and necessity of general and personal competencies in 21st-century forest education. Sample et al. [61] also approaches the issue through a broader framework, emphasizing the importance and necessity of the human dimension in natural resource management, primarily on conflict management,

communication skills in the workplace and with interest groups, and in forestry education. Ferguson [62] highlights the ongoing importance of biological and technical sciences in forestry education. He expresses the need for integration of human resources management, strategic planning, and financial management parallel to the changing requirements of the sector. Abe et al. [63] mentions the positive role of field education preprograms and adaptation technology to these programs.

Forestry education can be enhanced through the accreditation process of the IUC department of forest engineering, increasing participation in international exchange programs, reducing the intake quota, improving the internship programs, and granting scholarships to students through public forestry organizations [64]. It is evident that developing students' skills and adaptation to innovative teaching processes could help them feel more ready for their future jobs.

5. Conclusions

While job-related factors are the most important in choosing respondents' careers, it was observed that non-job-related factors also play a part in this decision. Public relations activities should be used to better introduce this field to society, especially to young people. Students should be provided with more comprehensive information about forest engineering, to increase both their knowledge and interest in the profession. Most forest engineering students' career plans depend on simply doing their jobs and working for public institutions. However, the employment capacity of public institutions is limited. A variety of employment fields should be provided in accordance with the multidimensionality of forestry education. Forest engineering should also be prioritized among projects that require green management, whether they are managed by a public or private institution. The lack of recognition of the profession and the low awareness about forest engineering are among the main reasons for the unemployment problem among the program's many graduates.

In conclusion, the attitudes among forest engineering students regarding their education at IUC improved over time. There are some positive efforts to improve the quality of education, but the students have doubts about their readiness to do their future jobs and the adequacy of their knowledge and experience. It is clear that the students need to be supported to feel ready to do the job, and their motivation for education and career should be increased. In this context, issues that need to be improved are the quality of applied courses, the integration of forest engineers working at various levels of the job in the educational program, strengthening internship programs, supporting career-related organizations, and improving mentorship opportunities with lecturers and colleagues.

The students' attitudes on their future job were not wholly positive. They have doubts about finding a job and having satisfactory working conditions and income; they also did not define forest engineering as an ideal, popular, or primarily preferred job. These attitudes cause low motivation for the students. In this context, some critical points should be strengthened to improve the students' motivation: (i) The place of forest engineering should be improved in the context of green jobs in Turkey, (ii) the trends in forestry and related sectors should be integrated into forestry education, (iii) cooperation with national and international forestry institutions should be strengthened, (iv) the capacity of forestry students for competition among other related sectors should be improved, and (v) education should provide specialization within forestry education and diversification of job opportunities.

The fact that students studying in the department are not entirely positive about their profession is a worrying situation for the future of forest engineering. This is not only as an issue of forestry education but also reflects forestry at the national level. It would be beneficial for forestry institutions to work together and prepare an action plan for the future.

Funding: This research received no external funding.

Institutional Review Board Statement: Since there was no Social Sciences Ethics Committee at the university at the beginning of the study, Institutional Review Board Statement could not be obtained.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Data are not publicly available, though the data may be made available on request from the corresponding author.

Acknowledgments: The author is grateful to the students who contributed to the research by filling out the questionnaires.

Conflicts of Interest: The author declares no conflict of interest.

References

1. Krott, M. *Forest Policy Analysis*; Springer: Dordrecht, The Netherlands, 2005; p. 323.
2. Mendes, A.M.S.C. Implementation analysis of forest programmes: Some theoretical notes and an example. *For. Policy Econ.* **2006**, *8*, 512–528. [CrossRef]
3. Szaro, R.C.; Langor, D.; Yapi, A.M. Sustainable forest management in developing world: Science challenges and contributions. *Landsc. Urban Plan.* **2000**, *47*, 135–142. [CrossRef]
4. Vancura, K. Challenging issues and future strategies of forest research and education in central and eastern European countries. *For. Sci. Technol.* **2010**, *1*, 156–167. [CrossRef]
5. APEGBC (Association for Professional Engineers and Geoscientists of British Columbia). *Guideline for Satisfactory Experience in the Forest Engineering Discipline: Required Competencies for Application of Theory*; APEGBC: Vancouver, BC, Canada, 2008. 14p, Available online: <https://www.egbc.ca/getmedia/b4db8a85-b10b-464c-832d-dd217dc06c63/APEGBC-Guideline-for-Satisfactory-Experience-in-the-Forest-Engineering-Discipline.pdf.aspx> (accessed on 20 August 2021).
6. Grebner, D.L.; Bettinger, P.; Siry, J.P.; Boston, K. *Introduction to Forestry and Natural Resources*, 2nd ed.; Academic Press: Cambridge, MA, USA, 2022; p. 512.
7. Mederski, P.S.; Borz, S.A.; Đuka, A.; Lazdinš, A. Challenges in Forestry and Forest Engineering—Case Studies from Four Countries in East Europe. *Croat. J. For. Eng.* **2021**, *42*, 117–134. [CrossRef]
8. Dodson, E.M.; Patterson, M.E. Rethinking Educational Models for Natural Resources Students. In Proceedings of the Council on Forest Engineering Conference: “Working Globally-Sharing Forest Engineering Challenges and Technologies around the World”, COFE, Coeur d’Alene, ID, USA, 22 July–2 August 2006; pp. 523–525.
9. Visser, R. What can forest engineering do for forestry in New Zealand? *N. Z. J. For.* **2007**, *52*, 3.
10. Pyles, M.; Boston, K. Forest Engineering—Professional Practice in Oregon. 2013 Council on Forest Engineering Annual Meeting. Available online: http://web1.cnre.vt.edu/forestry/cofe/documents/2013/Pyles_Boston.pdf (accessed on 8 May 2015).
11. OSU (Oregon State University). Career Development: Forest Engineering. Available online: <http://career.oregonstate.edu/students/what-can-i-do-degree/college-engineering/forest-engineering> (accessed on 8 May 2015).
12. Suzuki, K. Beyond Forestry Education. *For. Sci. Technol.* **2005**, *1*, 199–202. [CrossRef]
13. De Jong, W.; Huang, K.; Zhuo, Y.; Kleine, M.; Wang, G.; Liu, W.; Xu, G.A. Comparison of Forestry Continuing Education Academic Degree Programs. *Forests* **2021**, *12*, 824. [CrossRef]
14. Spinelli, R.; Visser, R.; Han, H. A Decade of Forest Engineering: Achievements and Future Directions. *Forests* **2019**, *10*, 724. [CrossRef]
15. Green, C.C. Forestry Education in the United States. *Issues Sci. Technol. Librariansh.* **2006**, *46*, 7.
16. Brown, N. A critical review of forestry education. *Biosci. Educ.* **2003**, *1*, 1–9. Available online: <http://bio.itsn.ac.uk/journal/vol1/beej-1-4.htm> (accessed on 3 September 2021). [CrossRef]
17. Innes, J.L. Multidisciplinarity, interdisciplinarity and training in forestry and forest research. *For. Chron.* **2005**, *81*, 324–329. [CrossRef]
18. Ameyaw, J.; Arts, B.; Wals, A. Challenges to responsible forest governance in Ghana and its implications for professional education. *For. Policy Econ.* **2016**, *62*, 78–87. [CrossRef]
19. Muncharaz, J.Z.; Carmenado, I.R.; Rivera, M. Education Planning Evolution for Forest Engineering in Spain. *Procedia – Soc. Behav. Sci.* **2015**, *197*, 1710–1715. [CrossRef]
20. Dyer, C.; Wingfield, M.J. Challenges and strategies facing forest research and education for the 21st century: A case study from South Africa. *For. Sci. Technol.* **2005**, *1*, 135–141. [CrossRef]
21. Burley, J.; Plenderleith, K.; Howe, R.; Freer-Smith, P. Forest education and research in the United Kingdom. *For. Sci. Technol.* **2005**, *1*, 67–76. [CrossRef]
22. Sasaki, S. Forestry education and research in Japan. *For. Sci. Technol.* **2006**, *2*, 123–128. [CrossRef]
23. Rebugio, L.L.; Camacho, L.D. Reorienting forestry education to sustainable forest management: The case of the university of the Philippines Los Banos college of forestry and natural resources. *For. Sci. Technol.* **2005**, *1*, 193–198. [CrossRef]

24. Özdoğan, M.; Ekizoğlu, A. Türkiye’de ormancılık yüksek öğretiminin başlangıcından bu yana mezunlara verilen unvanlar ve diplomalar. *J. Fac. For. Istanbul Univ.* **1996**, *46*, 45–64.
25. Gümüş, C. *Ormancılık Politikası (Forest Policy)*; Publication No: 216; Karadeniz Technical University Publication: Trabzon, Turkey, 2004; 444p.
26. Eraslan, İ. *Türkiye’de Ormancılık Öğretim ve Eğitim Kurumlarının Tarihsel Gelişimi (The Historical Development of Forestry Education Institutions in Turkey)*; Publication No: 1; Ormancılık Eğitim ve Kültür Vakfı: İstanbul, Turkey, 1989; p. 157.
27. Yurdakul Erol, S.; Şahin, G. Türkiye’deki orman fakültelerinin stratejik planlarının karşılaştırmalı analizi (A comparative analysis of strategic plans of forestry faculties in Turkey). *J. Fac. For. Istanbul Univ.* **2016**, *66*, 497–512.
28. Erdönmez, C.; Yurdakul Erol, S.; Yıldırım, H.T. Küresel, Bölgesel ve Ulusal Gelişmelerin Ormancılık Eğitimi Üzerindeki Etkileri. In *Proceedings of the 3. Ulusal Ormancılık Kongresi: 150. Yılında Türkiye’de Ormancılık Eğitimi*, Ankara, Turkey, 20–22 March 2008; Atmış, E., Ed.; TOD: Ankara, Turkey, 2008; pp. 253–261.
29. Yurdakul Erol, S. Orman Mühendisliği Bölümü Öğrencilerinin Mesleklerine İlişkin Görüşlerinin Değerlendirilmesi: İstanbul Üniversitesi Orman Fakültesi Örneği. In *Proceedings of the “IV. Ormancılıkta Sosyo Ekonomik Sorunlar Kongresi”*, Trabzon, Turkey, 15–17 October 2015; Toksoy, D., Bayramoğlu, M., Eds.; Karadeniz Teknik Üniversitesi: Trabzon, Turkey; pp. 390–400.
30. Laguarda, J.M. Developing students’ attitude leading towards a life-changing career. *Educ. Res. Int.* **2013**, *1*, 28–33.
31. Sarsenova, A.B.; Sadyrovab, M.S.; Montayev, A.B.; Imanbekova, B.I. The Change of Attitude to the Profession of University Graduates and Young Specialists. *Int. J. Environ. Sci. Educ.* **2016**, *11*, 12486–12499.
32. Garland, J.J. *Accident Reporting and Analysis in Forestry: Guidance on Increasing the Safety of Forest Work*; Forestry Working Paper No. 2; FAO: Rome, Italy, 2018; 77p.
33. TOD (Türkiye Ormancılar Derneği, The Foresters’ Association of Turkey). Meslektaşlarımızın Sorunları Ve Gelecek Perspektifleri. Available online: https://www.ormancilardernegi.org/dosyalar/files/OMO_Bildiri%282%29.pdf (accessed on 25 September 2021).
34. YÖK (Yükseköğretim Kurulu–Council of Higher Education). Yükseköğretim Kontenjan, Tercih ve Yerleşme İstatistikleri (2020 YKS): Orman Mühendisliği. Available online: <https://yokatlas.yok.gov.tr/meslek-lisans.php?b=10163> (accessed on 8 September 2021).
35. TOD. *Türkiye Ormancılığı: 2019*; Publication No: 47; Türkiye Ormancılar Derneği: Ankara, Turkey, 2019; p. 164.
36. OMO (Orman Mühendisleri Odası–The Chamber of Forest Engineers). *Meslek Camiamızın Orman Mühendisleri Odası’ndan Beklentileri ve Önceliklerinin Belirlenmesi Çalıştayı*; Ilbey Matbaa: Ankara, Turkey, 2018; p. 49.
37. Atmış, E. Türkiye’de orman mühendisliği eğitim-öğretimini etkileyen güncel politikaların değerlendirilmesi. In *Proceedings of the 1867’den Günümüze Ormancılık Eğitim-Öğretim Çalıştayı*, İstanbul, Turkey, 17–19 November 2013; İstanbul University, Faculty of Forestry: İstanbul, Turkey, 2013; pp. 65–76.
38. Toksoy, D.; Ayyıldız, H.; Özden, S. Türkiye’de Bazı Orman Mühendisliği Bölümü Öğrencilerinin Sosyo-Ekonomik Özellikleri Üzerine Karşılaştırmalı Bir Analiz. *Istanbul Univ. Orman Fak. Derg.* **2001**, *51*, 53–67.
39. Arslantaş, E. Orman Mühendislerinin Cinsiyet Algısı ve Ormancılık Örgütünde Cinsiyet Ayrımcılığı Gender Perception of Forest Engineers and Gender Separatism in Forestry Organization). Master’s Thesis, Ankara University Graduate School of Natural and Applied Sciences, Ankara, Turkey, 2006.
40. Hånell, B.; Magnusson, T.; Hallgren, J.E.; Karlsson, A. Swedish forest research and higher education-challenging issues and future strategies of forest research and education in Sweden. *For. Sci. Technol.* **2005**, *1*, 98–103. [[CrossRef](#)]
41. Grubbström, A.; Powell, S. Persistent norms and the #MeToo effect in Swedish forestry education. *Scand. J. For. Res.* **2020**, *35*, 308–318.
42. Searle, S.; Bryant, C. Why students choose to study for a forestry degree and implications for the forestry profession. *Aust. For.* **2009**, *72*, 71–79. [[CrossRef](#)]
43. Arevalo, J.; Mola-Yudego, B.; Pelkonen, P.; Qu, M. Students’ views on forestry education: A cross-national comparison across three universities in Brazil, China and Finland. *For. Policy Econ.* **2012**, *25*, 123–131. [[CrossRef](#)]
44. Daşdemir, İ.; Atmış, E. Orman fakültesi orman mühendisliği bölümü öğrencilerinin orman mühendisliği eğitimini değerlendirmesi. In *Proceedings of the 3. Ulusal Ormancılık Kongresi: 150. Yılında Türkiye’de Ormancılık Eğitimi*, Ankara, Turkey, 20–22 March 2008; Atmış, E., Ed.; TOD: Ankara, Turkey, 2008; pp. 53–75.
45. Türker, M.F. KTÜ Orman Fakültesi Orman Mühendisliği Bölümü Öğrencilerinin Türk Ormancılığına Bakış Açıları: Mevcut Durum, Geleceği, Sosyo-Ekonomik Odaklı Sorunları ve Çözüm Önerileri. In *Proceedings of the Ormancılıkta Sosyo-Ekonomik Sorunlar Kongresi, Çankırı, Turkey, 26–28 May 2006*; Özden, S., Ed.; Ankara University, Çankırı Faculty of Forestry: Çankırı, Turkey, 2008; pp. 53–75.
46. Aulerich, E. Challenges, rewards, and requirements for working globally. In *Proceedings of the 2002 Council on Forest Engineering Conference: “A Global Perspective” COFE*, Auburn, AP, USA, 16–20 June 2002.
47. UNECE (United Nations Economic Commission for Europe). *Green Jobs in the Forest Sector*; United Nations Publications: Geneva, Switzerland, 2018; 75p.
48. Yurdakul Erol, S.; Ekizoğlu, A. Training of Forestry Technical Personnel in Turkey. In *Proceedings of Personnel and Scientific Provision for the Sustainable Forest Management: Conditions and Prospects International Conference*, Yoshkar-Ola, Russia, 19–24 September 2005; pp. 80–90.
49. Šušnjar, M.; Oršanić, M.; Pentek, T.; Poršinsky, T.; Šporčić, M. Recent Challenges of Forest Engineering Academic Education. *Croat. J. For. Eng.* **2013**, *34*, 167–172.

50. Gümüş, C. Historical development of forestry education in the context of forest resources management in Turkey. *Turk. J. For.* **2016**, *17*, 93–98.
51. Özden, S.; Ekici, F. Orman mühendisliği mesleğinin dünü, bugünü ve geleceği. In Proceedings of the III. Ulusal Karadeniz Ormancılık Kongresi, Artvin, Turkey, 20–22 May 2010; pp. 17–23.
52. Korkmaz, M.; Duman, Y. Orman mühendisliği bölümü öğrencilerinin üniversite gereksinimlerinin Kano modeli ile sınıflandırılması (Classification of forest engineering department students' requirements from university by Kano's model). *Turk. J. For.* **2019**, *20*, 195–202. [\[CrossRef\]](#)
53. O'Hara, K.L.; Salwasser, H. Forest science education in research universities. *J. For.* **2015**, *113*, 581–584. [\[CrossRef\]](#)
54. Kostilainen, A. A perspective of the students of higher forestry education. *For. Sci. Technol.* **2005**, *1*, 224–227. [\[CrossRef\]](#)
55. Pelkonen, P. Challenges and strategies for forest education and research in Finland. *For. Sci. Technol.* **2005**, *1*, 104–114. [\[CrossRef\]](#)
56. Erdönmez, C.; Tolunay, A.; Ünal, H.E.; Özden, S. Bir bölüm meslek mensubunun Türkiye'deki orman mühendisliği eğitim ve öğretimi hakkındaki görüşleri. In Proceedings of the 3. Ulusal Ormancılık Kongresi: 150. Yılında Türkiye'de Ormancılık Eğitimi, Ankara, Turkey, 20–22 March 2008; Atmış, E., Ed.; TOD: Ankara, Turkey; pp. 123–130.
57. Jacobson, M.G.; Ham, C.; Ackerman, P.A. Forest management educational needs in South African forestry companies. *South. For. J. For. Sci.* **2008**, *70*, 269–274. [\[CrossRef\]](#)
58. Park, M.S.; Sojin, Y.; Yeo-Chang, Y.; Donsavanh, B.; Phetlumphan, B. Needs assessment of forestry education in Laos: The case of Souphanouvong University. *J. For. Res.* **2019**, *24*, 201–211. [\[CrossRef\]](#)
59. Rodríguez-Piñeros, S.; Walji, K.; Rekola, M.; Owuor, J.A.; Lehto, A.; Tutu, S.A.; Giessen, L. Innovations in forest education: Insights from the best practices global competition. *For. Policy Econ.* **2020**, *118*, 102260. [\[CrossRef\]](#)
60. Bullard, S.H. Forestry Curricula for the 21st Century—Maintaining Rigor, Communicating Relevance, Building Relationships. *J. For.* **2015**, *113*, 552–556. [\[CrossRef\]](#)
61. Sample, V.A.; Bixler, R.P.; McDonough, M.H.; Bullard, S.H.; Snieckus, M.M. The Promise and Performance of Forestry Education in the United States: Results of a Survey of Forestry Employers, Graduates, and Educators. *J. For.* **2015**, *113*, 528–537. [\[CrossRef\]](#)
62. Ferguson, I. Future forestry employment and education. *Aust. For.* **2012**, *75*, 192–199. [\[CrossRef\]](#)
63. Abe, M.; Yoshimura, T.; Yasukawa, N.; Koba, K.; Moriya, K.; Sakai, T. Development and evaluation of a support system for forest education. *J. For. Res.* **2005**, *10*, 43–50. [\[CrossRef\]](#)
64. Akkemik, Ü.; Okan, T. İstanbul Üniversitesi Orman Fakültesi Orman Mühendisliği Bölümünde eğitim-öğretimin tarihsel gelişimi, bugünkü durumu ve akreditasyon süreci. In Proceedings of the 1867'den Günümüze Ormancılık Eğitim-Öğretim Çalıştayı, İstanbul, Turkey, 17–19 November 2013; Istanbul University, Faculty of Forestry: İstanbul, Turkey, 2013; pp. 124–164.