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Research Article

Career plans of gifted children in agriculture and biotechnology: The example of Türkiye[1]

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Abstract

The pandemic played a role as a good indicator and accelerator regarding the importance of agriculture and biotechnology. However, it is not possible to say that awareness on this issue is fully formed. In particular, there is a need for an analysis of the situation of developing countries in directing their gifted potential to this field. In this study, using the document analysis technique, one of the qualitative research types, about the situation of directing Turkey's gifted potential to the field of agriculture and biotechnology; Educational curricula and university programs were examined. While there is no achievement directly related to agriculture in the social sciences curriculum (only one, in the surrounding areas), there are 4 achievements related to biotechnology in the science curriculum. It has been determined that programs related to agricultural engineering have very low scores in university entrance rankings (between 197-484.000). It was determined that there are only 59 programs in higher education and only one is at a private university. It is not possible for gifted students to have a career plan in a field related to agriculture. In this respect, gifted children can be supported in terms of career planning and guidance in this field through necessary curriculum arrangements, guidance programs, and university honor programs.

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Introduction

Gifted children are often mistakenly considered problem-free students, yet it is known that they can make mistakes in their decisions, which may lead to unhappiness, hence the need for guidance (Kerr, 1991, 2009). The fact that gifted children may experience social and emotional problems (Delisle and Lewis, 2003) becomes particularly intense during adolescence and beyond. It has been emphasized that they may also face challenges in career choices, with the fundamental issues being their multiple talents, difficulties in self-regulation due to their versatility, and struggles in finding individuals who can meet their counseling needs (Sart, 2011). Sart's study contains significant findings that are particularly relevant to gifted students in Turkey, the focus of my research. Data obtained through in-depth interviews with high school students revealed that gifted students were unable to achieve success in the higher education entrance exams. While students with talents in the arts and sports had low academic success, those with talents in both music and academics exhibited high academic success. It was also determined that students with talents in music and academics had high academic self-perception and emotional intelligence. The most significant finding, however, is that all gifted

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students shared a common issue: indecisiveness regarding which career field to pursue and experiencing pressure due to their families' expectations.

Education of gifted children in Turkey: Science and Art Center

Gifted children are individuals who show extraordinary performance in their talent areas. Special educational support is needed for the increasing educational needs of these children. This support education service is provided by Science and Art Centers (SAC) in Turkey. According to the latest information, there are 230 or more institutions (MoNET SECD, 2023). Gifted students are included in the group of students with special education needs. Therefore, it is aimed to support them in realizing their goals by making them aware of their talents and developing them in line with their talents (MoNET SECD, 2023). It is seen that there have been different institutional structures in Turkey throughout history to support gifted individuals. Enderun is one of the theories regarding the education of gifted people in the world during the Ottoman Empire. In addition, during the republican period, institutional formations such as Science High Schools, Fine Arts High Schools, Sports and Social Sciences High Schools played a supporting role in talent development. However, SACs seem to differ from these institutions in terms of identifying gifted students at an early age and supporting them until university education. It is seen that SACs offer a 5-stage education program model in support of formal education after the identification of gifted students (SAC Directive, 2023).

SACs have these important functions in supporting gifted students in Turkey, and research examining perceptions towards these institutions emphasizes their positive aspects, for example; It is also stated that it has aspects such as being supportive, guiding, exciting, entertaining while learning, encouraging research, and guiding (Yerli, 2022; Aslan and Doğan, 2016; Kunt and Tortop, 2013).

Problem Study

This study aims to investigate the current situation regarding the ability of gifted students in Turkey to plan a career in the fields of agriculture and biotechnology. In line with this objective, the presence of content related to agriculture and biotechnology in the curriculum in Turkey, as well as the status of programs in agriculture and biotechnology in higher education, were examined.

Method

This research is a case study type, one of the qualitative research types, and involves examining the documents of institutions related to the career planning of gifted students in the field of agriculture. In this respect, an examination was made from the perspective of Science and Art Centers, which are institutions related to gifted education in Turkey.

Results

Curriculum of Science and Art Center

Science and Art Centers are institutions that support formal education for gifted students in Turkey. The programs of these institutions; Adaptation, Support, Discovering Individual Talent, Discovering Special Talent and Project Curriculum outcomes are no different from formal education curriculum outcomes (MoNET SAC Drictive, 2023). In the 5-stage education model of SACs, instructional support is provided by differentiating the achievements in Turkey's normal education curriculum. Curriculum differentiation models and strategies in gifted education are used for instructional differentiation (Tortop, 2018). In this research, curriculum achievements including agriculture and biotechnology subjects in Turkey were examined.

Social Sciences Achievements about Agriculture-Biotechnology in Turkey

SB.5.7.1. Researches the role of the place where he lives and his environment in the economic relations between our country and other countries.

> *Appropriate areas of economic activity such as agriculture, industry, tourism, transportation, education and cultural industry are mentioned*. (Social Sciences Curriculum, MoNe, 2023).

When the social sciences course 5th grade curriculum is examined, it is seen that there is no direct achievmetn regarding agriculture and biotechnology. Achievment takes place in the context of the environment and the economic

environment. It cannot be said that this achievement is sufficient to direct students to career fields directly related to agriculture.

Science Curriculum Achievements about Agriculture-Biotechnology in Turkey

Subject / Concepts: Genetic engineering, artificial selection, biotechnological studies, impact of biotechnology applications on the environment

F.8.2.5.1. Relates genetic engineering and biotechnology.

Examples of breeding, vaccination, gene transfer, cloning and gene therapy are emphasized.

F.8.2.5.2. It discusses the dilemmas created within the scope of biotechnological applications and the beneficial and harmful aspects of these applications for humanity.

F.8.2.5.3. Makes predictions about future genetic engineering and biotechnology applications. (Science Curriculum, MoNE, 2023).

When the science course curriculum is examined, it is seen that there are 3 achievements at the 8th grade level. It seems that these gains are directly related to genetic engineering and biotechnology applications. It seems that the field of genetic engineering and biotechnology is closer to the field of medicine rather than directly to the field of agriculture. Especially in biotechnology applications, the emphasis on the harmful aspects of genetic modification for humanity is striking. This guidance may lead the student to the conclusion that all biotechnology applications, especially in the field of agriculture, may be harmful. However, including fields such as biotechnology and genetic engineering in the curriculum is positive for students' future career plans.

Agricultural Engineering Higher Education Program Entering Exam Scores

There are 59 university programs in Agricultural Engineering in Turkey. The number of this program is decreasing. The entry ranking for this program is 382.655. Considering that the total number of students taking the exam is 1.5-2 million, this ranking is quite low. The most interesting situation is that although this program is available in 59 universities, only one program in 1 university remained open by student choice in 2023 (Table 3). New programs related to agriculture are approved by the Turkish Higher Education Institution. Among these, the Agricultural Machinery and Technologies Engineering Program was opened in 2023 by students in 8 state universities. The success entry ranking for this program is between 332-458,000 (Table 1). Another program, the Plant Protection Program, has been opened by choice in 27 universities. The success ranking for entering this program is between 197-484,000 (Table2). All of these universities are state universities.

Table 1. Agricultural Machinery and Technologies Engineering Program: universities, base scores and success rankings (2023)

University	Base point	Success ranking
Ege University (State)	272,92023	332593
Ankara University (State)	269,78945	343690
Akdeniz University (State)	264,02410	365255
Çanakkale Onsekiz Mart University (State)	260,31380	379959
Ondokuz Mayis University (State)	256,68186	395296
Selçuk University (State)	255,08801	402065
Çukurova University (State)	250,95094	420921
Isparta Uygulamali Bilimler University (State)	250,34422	423784
Atatürk University (State)	243,33716	458995

Source: https://istanbulbogazicienstitu.com/

Table 2. Plant Protection Program: universities, base scores and success rankings (2023)

University	Base point	Success ranking
Ege University (State)	326,63309	197259
Akdeniz University (State)	316,74433	216627
Ankara University (State)	306,97577	237730
Çukurova University (State)	299,21320	256426
Bursa Uludağ University (State)	293,57350	271025
Selçuk University (State)	284,34958	296642
Aydin Adnan Menderes University (State)	282,47001	302233
Isparta Uygulamali Bilimler University (State)	281,88170	304007
Çanakkale Onsekiz Mart University (State)	278,72454	313801
Ondokuz Mayis University (State)	276,67094	320280
Erciyes University (State)	275,06226	325493
Harran University (State)	269,75056	343825
Bolu Abant İzzet Baysal University (State)	266,30290	356498
Hatay Mustafa Kemal University (State)	265,36402	359972
Uşak University (State)	264,89763	361796
Tekirdağ Namik Kemal University (State)	262,82988	369991
Kahramanmaraş Sütçü İmam University (State)	261,67423	374561
Dicle University (State)	259,74047	382330
Ordu University (State)	259,28416	384177
Düzce University (State)	257,44018	391989
Malatya Turgut Özal University (State)	256,41732	396378
Kirşehir Ahi Evran University (State)	254,09581	406480
Van Yüzüncü Yil University (State)	253,46440	409358
Tokat Gaziosmanpaşa University (State)	253,29184	410144
Atatürk University (State)	249,73116	426681
Yozgat Bozok University (State)	248,03842	435024
Siirt University (State)	239,89963	477572
Bingöl University (State)	238,67816	484364
Ege University (State)	Not full	Not full

Source: https://istanbulbogazicienstitu.com/

Table 3. Agricultural engineering program: universities, base scores and success rankings (2023)

University	Base point	Success ranking
Bilecik Şeyh Edebali University (State)	275	383.655

Source: https://yokatlas.net

The university with the highest score among these programs is a private university. In the legal regulations regarding the formation of foundation universities in Turkey, emphasis is placed on the fact that they are higher education institutions where high-level research is carried out, In the second part, article 5, these institutions are defined as follows.

> *Foundation universities are faculties, institutes, colleges, universities, colleges, universities, colleges and universities, which have public legal entities established by law and engage in high-level research, education and training, scientific research, publications and consultancy, provided that they spend their income only for the purpose of developing their own universities and institutions and organizations owned by universities. It is a higher education institution consisting of vocational schools, support schools, preparatory schools or units, similar organizations and units.* (T.R. Presidential Legislation Information System, 2023).

The research shows that the agriculture-related program at Yaşar University (Web 1) has a high entrance score. There are 4 departments in Yaşar University, faculty of Agricultural Sciences and Technologies. These; Agricultural Machinery and Technologies Engineering, Agricultural Machinery and Technologies Engineering, Agricultural Machinery and

Technologies Engineering, Plant & Soil Sciences and Cultivation. The reason for this situation may be that Yaşar Holding (Web 2), which has an impact on supporting the university foundation, has important companies in the dairy and meat industry.

In addition, an important factor in career choice is Konya Food & Agriculture University (Web 3), a foundation university established in Konya in 2013 in the field of agriculture and food. Having such a representative university is an important development in terms of specialization and career development in the fields of food and agriculture. However, the university entrance exam scores in these university programs are not in the upper percentiles.

Conclusion

As a result of the research, it was determined that the fields of agriculture and biotechnology were directly included in the science curriculum in the secondary school period, which is a critical period in shaping the careers of gifted students. However, the field of genetic engineering may lead gifted students to the medical field, which generally offers secure and high-income professions. It is seen that these students are in the upper percentiles in the university entrance exam rankings due to their generally high academic success. However, agriculture and biotechnology programs are in the lower percentiles. This situation causes them not to choose these departments. In addition, the high expectations and pressures of families regarding these children may direct them to medical fields due to their guaranteed employment and high income. In addition, they may turn to areas such as software and artificial intelligence, which have increased in popularity after the pandemic.

In this research, the general framework was conducted on the axis of curriculum components and preference situations of university programs in the field of agriculture and biotechnology. In future research, a clearer and broader perspective can be drawn regarding the interests and tendencies of agriculture and biotechnology career fields through in-depth interviews and surveys with gifted students.

It may be recommended for practitioners and policy makers to make arrangements regarding the agricultural and biotechnology professional fields in the curricula of gifted education programs. In addition, arrangements can be made in higher education programs to encourage gifted students to pursue career paths in agriculture and biotechnology through incentives such as scholarships and honor programs related to these fields.

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