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COMPARING VOCATIONAL AND TECHNICAL EDUCATION SYSTEM OF TURKEY AND GERMANY

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Abstract

Employing individuals having desired qualifications for required and trained workforce is possible with a sense of qualified vocational and technical education. Vocational and technical education has fallen behind of general academic education in Turkey recently. This situation can be seen as a disadvantage for Turkey who has long term valuable targets to be productive society within the years of 2023 and 2071. So, analysing education system, curriculum and practices of other countries having important success in the field of vocational and technical education is thought to be helpful on explaining the source and reasons of this disadvantage. Germany, which has one of the most employment rate among OECD countries, is selected to be compared with Turkey by different aspects in the context of education system, curriculum and practices in this study. Because of analysing and comparing vocational and technical education system and curriculum of Turkey and Germany, interpretative paradigm, one of the qualitative research methods, was selected as a research method of the study. The findings obtained were discussed with regard to school facilities, curriculum and teacher training system. In this respect, this study

is thought to make a great contribution to determine deficiency, activities and required fields on practice.

Keywords

Vocational and Technical Education, Education System, Turkey, Germany

1. Introduction

In our age, technology and industry are inseparable elements of contemporary society culture, but this modern formation education affects institutional, functional and structural aspects. It is stated that scientific and technological developments constantly differentiate the work and this differentiation gives a dynamic character to vocational and technical education programs. (Sezgin, 2009). Therefore, it is stated that there is a need for qualified labour force that has a significant degree of production, Research & Development and innovation competencies in order to compete in the global life and market area that lives in the age of production and technology. The degree of compliance between the qualifications required for the job and the competences of the individual to be employed in the same field of work is the basic indicator of the effectiveness of vocational education. In this context, it is possible to employ the qualified occupational and technical education and practices by employing the areas with the need for trained labour force. (Bolat, 2016). In addition, it is stated that rapid changes in technical knowledge and skills in automation and cybernetic applications in production processes lead to a new qualification in vocational and technical education. (Alkan, Doğan ve Sezgin, 1998). In other words, it is stated that neglecting vocational and technical education will lead to problems of qualified labour shortages in developing countries. (Bolat, 2016).

Vocational and technical education in Turkey in recent years, lagged behind the general academic training. This condition can be treated as a serious disadvantage experienced for goals put by Turkey in the long term towards 2023 and 2071 as being the production community. Thus, vocational and technical education system related to this area of the country that achieved considerable success in literature when scanned, taken up training programs and applications with Turkey were encountered few studies revealing the comparative analysis. Being one of the countries with the highest employment rates in the OECD countries, Germany in this study was selected to compare the programs in terms of theory and practice training and they were discussed to exhibit similarities and differences from different angles with Turkey.

It is thought that the situation, which is discussed in the context of school structures, education programs and teacher training systems of the countries, will make serious contributions to the deficiencies in our country, the applications and activities which are not made in this field and the areas needed in practice.

The purpose of this research is comparatively describe and investigate Germany which is one of the leading countries in vocational and technical education and Turkey which is in development process in this field in the context of vocational and technical education systems.

2. Method

In the field of comparative education, it is generally stated that two method approaches are frequently used and studies are based on these methods. As Lauterbach and Mitter (1998) stated that one of these methods is interpretative approach and the other is analytical-experimental approach. Interpretive approach training is aimed at understanding together with the interpretation of the programs, textbooks and curriculum used in the relevant field; the analytical and experimental approach tries to reach a conclusion by analysing the events, facts, relationships and trends in the education process. Interpretive approach was used as a research method in this study to compare Turkey's and Germany's vocational and technical education systems.

3. Vocational Education in Turkey

When the history of Turkish education is examined, it is seen that the developments related to vocational and technical education are reflected both before and after the Republic. The developments in different fields with the Republic have also directly and indirectly affected vocational education. Art schools for each region in 1931, the General Directorate of Vocational and Technical Education in 1933 and the Vocational and Technical Education Undersecretariat in 1941 were established (Nogay, 2007). Until 1977, with the help of the interim regulations and reforms, developments in vocational and technical education were tried to be achieved but the desired success could not be achieved. With the year 1977, the Law on Apprentices, master-builder and Mastery was enacted and the main responsibility for apprenticeship training was given to the Ministry of National Education. Vocational and Technical Education Directorate was established in 2011 and vocational training practices under different roofs were gathered under one roof. (MEB, 2014). When we look at the vocational and technical education systems of the countries,

which are important in terms of employment rate in the world, it is observed that they keep the interest in this field alive and that young people take care and encourage participation.

3.1 Secondary Schools and Curriculum on Vocational and Technical Education in Turkey

The secondary education institutions in Turkey are consisted of two different structure as general high schools and vocational-technical high schools. General high schools are the education level which prepares students for higher education and vocational and technical high schools for life and work as a profession. Additionally, both of them have role in order to prepare students for higher education (MEB, 2014).

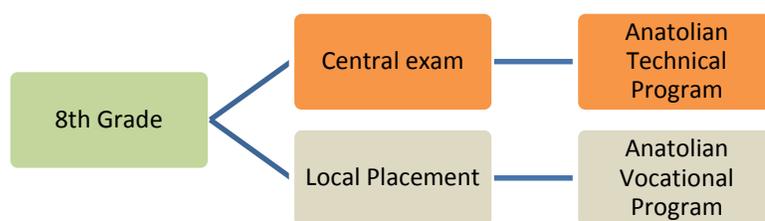
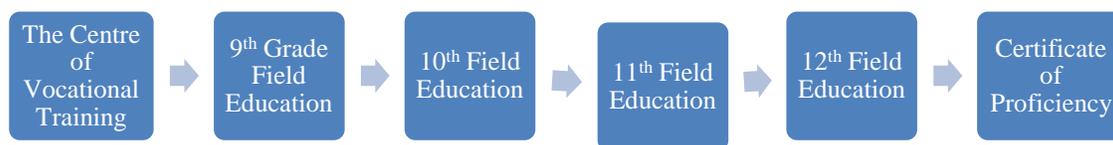


Figure 1: Vocational and Technical Education System Settlement Process in Secondary Education Institutions

As shown in Table 1, during the placement with the central examination to the Anatolian Technical Program, the registration and placement of the programs are done to the Anatolian Vocational Programs without examination.

All students take courses in the curriculum of the 9th grade of vocational and technical education in secondary schools. Individual interest, desire and performance accompanied by the 10th Grade level to decide which field to continue. The students who are educated according to the fields in the 10th grade are divided according to their profession by 11th grade. Students in the field of related profession have a mastery degree are graduated from the field whose profession are determined and decided before in 12th Grade.



Apprentice students are enrolled in vocational training centers to receive mastership training.

Apprenticeship training is included in compulsory education in order to train students as a master. The students who have completed the apprenticeship education have the right to go to higher education if they complete the difference courses and receive a diploma.

3.2 Higher Education Schools and Curriculum on Vocational and Technical Education in Turkey

Higher education institutions covers at least two years of higher education after secondary education in Turkey (Ada ve Baysal, 2009). However, institutions where professional and technical education are carried out in professional sense are considered as vocational schools (Bolat, 2016). Vocational high schools are also mentioned as schools which try to meet the qualified labor force of various institutions or private sector after secondary education. (Gökdoğan ve Sarıgöz, 2012). The higher education institutions which are actively in progress in 2018 are given in Table 2.

Table 2: *Number of Units by Higher Education Types*

University Type	State	Foundation	Total
University	112	68	180
Faculty	1266	428	1694
College	362	105	467
Vocational Schools of Higher Education	872	99	971

As it can be seen in Table 2, the vocational schools which are classified in three different forms have 872 under the roof of the state universities and 99 are among the foundation universities. As a leading institution in the field of vocational and technical education, vocational schools of higher education have reached a serious number of 976 in total.

3.3 Teacher Training System of Vocational and Technical Education in Turkey

Vocational Education Faculties, Faculty of Commerce and Tourism Education, Faculty of Industrial Arts Education and Technical Education Faculties served as institutions to meet the needs of teachers in vocational and technical education in Turkey. It was decided to close these schools and establish the technology faculties with the decision taken by the Higher Education Institution in 2009 (Official Gazette, No: 27405, Page: 42). It is seen that the aim of the newly established technology faculties is to train engineers rather than educate teachers (Bolat, 2016). In order to cover the shortage of teacher training in the field of vocational and technical education, students who graduated from these faculties has the opportunity to be a teacher in their field with

the condition of getting pedagogical formation education. After taking their field courses, the courses that should be taken with pedagogical certificate program are given in Table 3.

Table 3: *The Courses of Pedagogical Formation Education Certificate Program*

Introduction to Education Sciences	Selective I
Teaching Principles and Methods	Selective II
Measurement and Evaluation in Education	Special Teaching Methods
Guidance	Instructional Technologies and Material Designs
Classroom Management	Teaching Practice

After completing the theoretical courses and teaching practice mentioned in Table 3, students are entitled to receive pedagogical training. Graduated students can apply for teacher assignments in their own fields with this certificate and their assignments can be carried out as needed.

4. Vocational Education in Germany

Functions and functions of the state are shared between the federal government and 16 states in Germany. States are also responsible for official and private education institutions within their borders. Therefore, it is stated that vocational schools continue their education and training activities depending on the local authority under the responsibility of the states. (European Commission, 2015). It can be said that there is a good level of development in the general vocational education policy of Germany due to the close cooperation between the states. The educational programs of vocational schools are largely established by the feds themselves. These curriculums are harmonized with the framework program created by the government with specific studies (Schneider, Krause and Woll, 2007).

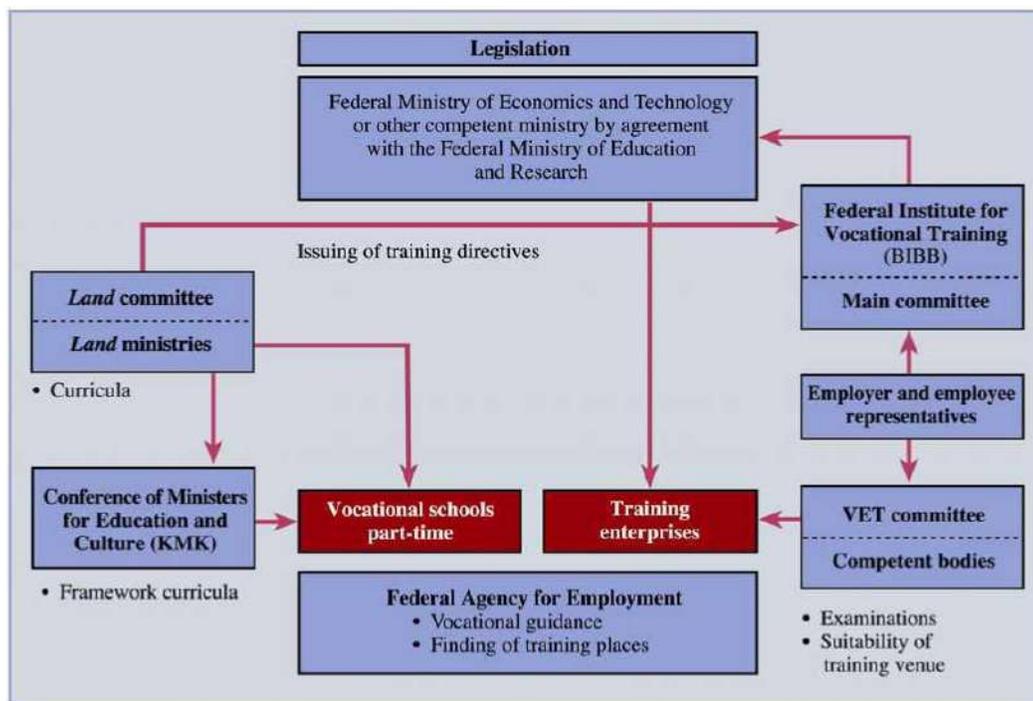


Figure 2: Responsible Units in Vocational Education in Germany

As seen in Figure 2, it is seen that vocational education in Germany is carried out in two ways as schools and enterprises. There are ministries, employers and workers' representatives and various committees in charge of establishing the framework program to be implemented in the states. The Law on Vocational Education and Training, in which vocational training depends, is binding on all governing bodies throughout the country. The general education programs of vocational schools are usually formed by the feds themselves. These programs are aligned with the framework program created by the government.

4.1 Secondary Schools and Curriculum Providing Vocational and Technical Education in Germany

The presence of well-trained German workers is seen as a prerequisite for the economic success of the country. (Cedefop, 2013). The vocational and technical education process in Germany and the summary information of these institutions are given in Table 4.

Table 4: Secondary Schools Providing Vocational and Technical Education in Germany

School	Time	Compulsory Education Framework	Education Environment
Dual system			

Full Time Vocational Schools	3 years and 5 years	includes 3 years compulsory education	10 th , 11 th and 12 th grade
Technical Secondary Schools			
Advanced Vocational Secondary Schools			
Health Schools			

It is observed that vocational education in Germany continues with a dual system. In addition, it is stated that all students in the education system have the right to enter vocational education. Students who start vocational education receive three years of education except for some departments such as midwifery and nursing (Eurydice, 2015). In the dual system combining vocational schools and school learning environments, individuals who complete their vocational education are employed as qualified professional staff. Full-time vocational schools (Berufsfachschule) are the schools with the highest number of students in Germany. The first year of these schools is a dual system. The training given in the context of professional guidance and the purpose of service covers a period of three years. Students in these schools continue their vocational education in groups of six. When we look at the education programs of full-time vocational education institutions, it is seen that there are programs related to foreign languages, professional knowledge, labor market, arts and health. The duration of education in schools varies according to the vocational programs that the students want to specialize in. (Cedefop, 2013). At the end of the two-year study, students are given a certificate of completion and pass to the technical secondary schools (Fachhochschule). In these schools, the first year in-house applied education and training; in the second year, it is seen that general and special vocational education practices are included. Technical secondary education institutions have areas of expertise such as business and management, technical skills, health and care, design, nutrition and home economics. (Eurydice, 2015). In advanced vocational secondary education institutions (Fachoberschulen), students receive training in order to have a middle level of responsibility such as the independent management of an enterprise, training of the personnel, taking basic responsibilities. Students receive training for the professions they want to specialize and the duration of their training varies according to their vocational education. As a result of the training received, students are subjected

to an exam and receive officially have certificates such as technicians, accountants, young and babysitters after their exams. (Cedefop, 2013). Finally, another vocational school that provides education at secondary level is Health schools. The education of profession such as nursing, midwifery, treatment massage, therapy are given in these schools. Most of the training is given in hospitals due to the characteristics of professions. Students are employed in these fields with the certificates they have received as a result of the theoretical and practical training received.

4.2 Higher Education Schools and Curriculums Providing Vocational and Technical Education in Germany

It is known that Germany is the basis of the vocational and technical education process in the context of higher education, and various institutes providing vocational training. In some states, it is seen that there are vocational academies providing vocational higher education for those who provide higher education and have completed their high school education. The summary information on vocational and technical education in higher education, which is considered in the context of different schools, is given in Table 5.

Table 5: *Higher Education Schools Providing Vocational and Technical Education in Germany*

School	Duration of Education	Outputs	VTE System
University	2-6 years	Diplom, Magister Artium, Staatsexamen, Graduertenkollegs	Dual Education, Qualification, Certificate, Diplom Company Education
Vocational High schools			
Art and Music Colleges			
Vocational Academy			

There are different types of schools among higher education institutions in the German education system. Training periods for different vocational programs in these educational institutions vary between 4 and 10 semesters. (Cedefop, 2012). The working organization, certification and reward systems of these schools are subject to higher education legislation. The areas of professional interest are applied sciences, engineering, applied technical disciplines, business and management areas, design and social field studies. Practical training given in schools

is carried out in the context of professional training with industrial enterprises and other employer institutions. These schools, which are attracted by employment opportunities and skilled labor, cover one third of the young people studying in Germany. Another higher education institution in the country is the art and music colleges. In these schools, there are departments that offer fine arts, artistic career and music education. The programs related to the fields of directing, theater and stage writing, film, media and media communication form the programs of the related schools. An overview of vocational training in higher education in Germany is given in Table 6.

Table 6: Vocational and Technical Education in Higher Education in Germany

Curriculum	Sector	Type of Education	Duration of Education	Education in	Acceptance Conditions
Dual System	Economics and Technology	School and Practice Based	3-5 years	University	Internship contract and qualification certificate for entry to higher education
Applied Sciences	Engineering, Administration and Management, Science and Design, Information and Communication Technology, Health	School and Practice Based	3-5 years	University	Qualification certificate for entry to higher education
Vocational Academies	Services, Economics and Technological Sciences	School and Practice Based	3-5 years	University	The conditions of Related State
Health Schools	Health Services	Hospitals related to Schools	2-3 years	Vocational High School	Qualification before secondary education

					first stage certification and work experience
Universities	All Fields	School	3-5 years	Phd	Qualification certificate for entry to higher education

4.3 Teacher Education Systems for Vocational and Technical Education in Germany

Teacher education is carried out depending on the states due to the political structure of Germany. It is the responsibility of Committee of the Ministers of Culture of the Order ”to ensure inter-state equivalence and to make decisions on supra-state issues (Coşkun, 2000). Students who wish to enter the faculties of education or the faculty of educational sciences are required to have general diploma of tertiary education (Abitur) (Milotich, 1999; Eurydice, 2015). The aim is to enable pre-service teachers to acquire professional qualifications and especially to take responsibility in their field (Eurydice, 2015). Prospective teachers receive an academic education according to the structure, characteristics and branches of the institutions, in higher education schools, universities, educational institutes, music and art education schools or multi-purpose universities in Germany. The courses are divided into three groups as educational sciences, science fields and field teaching in teacher education given. The curriculums of these colleges are arranged in accordance with the expectations and characteristics of the prospective teachers they intend to work in and they are provided with appropriate practical training. (Demir, 1995). German language teaching, mathematics, art education, music, sports, and life sciences are taught within the framework of teacher education in all the states. In Germany, vocational and technical education teachers are involved in vocational education activities in vocational schools and within the sector. These teachers are trained in the vocational training institutes (Wissenschaftliche Hochschulen) and the technical school (Technische Hochschulen). Teachers are required to take some exams in addition to the certificates they have received from universities or certificates that they have received from equivalent institutions in order to start the task. If they are successful in these exams

which consist of written and interview exams, they take the I. State exam to enter the profession. Then the internship period begins and candidates who pass the II. State exam and these processes successfully can work as a vocational and technical education teacher or as a commercial school teacher. (Scheineder, Krause ve Woll, 2007).

5. Results and Discussion

Vocational and technical education system of Turkey and Germany was taken comparatively in this study considering the scope of administrative, secondary education higher education and teacher education dimensions and the results obtained are discussed in detail below.

5.1 Vocational Education in Turkey and Germany

It is seen that Turkey and Germany pass through different processes in terms of the historical development of their vocational and technical education. When we look at the countries' educational management in this context, Germany's federal structure and Turkey's centralized management is seen. Therefore, it can be said that there are serious implications for the management of countries on the determination and management of education policies. In the context of vocational education in Turkey with 4 + 4 + 4 education system starting age of students in vocational education is seen as the last 13 years, the beginning to training class is seen as a 9th grade level. However, starting age of students in vocational education is seen as the last 16 years in Germany with 4+6+3 education system and the beginning to training class is seen as a 11th grade level. Although the age of individuals beginning to vocational education is seen earlier in Turkey than Germany, it can be said that Turkey fall behind Germany in terms of training qualified personnel. When looking at the highest employment rate in the age range of 25-64, Germany has a very high employment rate remained at 88% but Turkey has 76% (OECD, 2017). Therefore, this finding supports the conclusion we have reached regarding qualified staff. While Germany's unemployment rate of graduates from high school is seen 20% this rate is observed 32% in Turkey. Therefore, in order to train qualified personnel needed for employment in the area it said that Turkey is a serious point deficit. In addition, it can be stated that there are serious shortcomings in the management of supply-demand balance, both in the context of educational policies and in the management of vocational and technical education process.

5.2 Secondary School

It is seen that these institutions differ in terms of their structure, duration of education, class of starting education and vocational education within the scope of compulsory education in the

context of the research when the secondary education institutions which provide vocational and technical education in the countries are examined. In these schools, the education given for different disciplines is handled within different periods.

In the German education system, vocational education begins on the second level of secondary education. While dual vocational training system is applied, vocational training is also given in full time schools. It has been demonstrated by different studies that this practice plays a major role in Germany becoming an important industrial country (Li, 2013; Bolat, 2016; Hippach-Schneider, Krause ve Woll, 2007). Implementation of apprenticeship training in vocational and technical secondary education in Turkey in previous years, with the advent of compulsory education was interrupted for 12 years and is increasingly weakened. The fact that apprenticeship training will be evaluated in the last 4 years of the compulsory education period (at the secondary level) may be seen as a positive step for the Turkish vocational education system. Currently, the vocational education system, which is being implemented mainly in secondary schools, is criticized by employers and it is stated that it does not respond to the need for employment. In Germany, the number of students attending vocational education is around 65% of the educational age. In other words; 2 out of every 3 students receive vocational training. This ratio is shown in the vicinity of 44%, according to official statistics in Turkey. For many years, development plans, government programs, expressions and targets in political party programs have been included in order to increase the number of students, quality and interest of students to vocational education. However, despite all these efforts, it is seen that the desired success in terms of both quantity and quality has not been received in Turkey. In recent years, efforts are being made in order to provide a profession for people who are after 18 years of age as a result of the arrangements and supports in this context.

5.3 Higher Education

It is necessary to study at the secondary school of Gymnasium Oberstufe and at the end of the training, to pass the Abitur exam, which can be called a high school graduation exam In order to enter higher education institutions in the Federal Republic of Germany. Students who pass this exam will have the right to attend any higher education institution without taking another exam for transition to higher education. However, in higher education, due to graduation success average and in some cases, the application time of students is taken as a criterion for placement in the relevant higher education institution. In Turkey, students of higher education institutions that they

can make the transition, centrally organized Student Selection and Placement Exam depends on the success. As a result of the central exam applied to students in higher education, most of the students coming from different educational institutions are exposed and after this process, it is much more difficult to direct young people to vocational education. While vocational high schools with a 2-year duration at the point of continuing vocational education are directly receiving students from vocational secondary education institutions, in order to increase the quality of this education, the direct transition has been removed since 2018. In this case, it is possible to say that more students will not be able to attend higher education.

5.4 Teacher Education System for Vocational and Technical Education

It is seen that teacher training systems for vocational and technical education are shaped according to the needs of the countries as a result of the analysis. Although there is not much difference between the two countries in this context, the quality of education in the Pädagogische Hochschule and the number of teacher candidates in Germany in the targeted and planned amounts and the fact that teachers are taken after the two state exams have a positive effect on the German education system. It is seen that Vocational Education Institutes are the institutions that have aimed to fulfill this task most in Germany. Teacher education in vocational and technical education was provided by the faculties of Technical Education which were closed in recent years in Turkey. Together with the latest regulations, Turkey stopped using direct teacher training in vocational and technical education, and started to use a model that brought pedagogical formation qualification to the graduates of related undergraduate departments. However, the process of assigning teachers is carried out through a state examination (KPSS). Graduating a large number of students from teacher education institutions, and in contrast, having a limited number of prospective teachers to be appointed as a teacher has affected the Turkish education system negatively. When the situation between two countries is examined in terms of vocational and technical teachers; In Germany, it is seen that technical teachers mainly carry out theoretical vocational courses, as well as to teach a culture course, and practical training is carried out by application trainers. In Turkey, vocational and technical education teachers, are studied both the theoretical and practical vocational courses except for practical education given in operations and there is no second area where they have to teach their fields. While in-service training is compulsory in Germany, it is usually optional in Turkey. The university is not sufficiently cooperate with schools in Turkey or only take place in the school experience and teaching practice time is not acceptable. As in Germany, long-term

practical studies in regional schools will benefit the prospective teachers in their readiness to the profession. In addition to this, although vocational training is given prior to the internship in Germany, the trainees are given practice training for up to two years after the first state exam, ie the basic teaching practice training is given after the prospective teacher is admitted to the profession. All students entering the education faculties in Turkey to see the practical education. However, giving education to thousands of students who cannot actually be teachers every year causes both human and financial resources to be wasted. This is the main reason why the above-mentioned prospective teachers have not been able to undertake long-term active teaching practice.

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