



The Gender Analysis of Enrolled Students: A Comparison Study of Austrian and Turkish Higher Education

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Abstract. There are more data than ever to analyse and support higher education management decisions and trends nationally and internationally. National higher education systems should rely more on data-based decision making, so on data driven decision support systems (DSS). Using education data provided by Eurostat between 2013–2017, a DSS has been built. By using this DSS, enrolled students related gender data analysed in detail. The data dimensions of the research are enrolled students, gender, education level, fields of education. But, a data-driven DSS for all education levels and fields of European countries will be next research subject in order to provide education intelligence for all education policy makers, managers, teachers, academic staff students and families.

Keywords: Gender · Higher education ·
Decision analysis · Students · Data visualization ·
Educational data science and data driven decision support system

1 Introduction

There are more data than ever to analyse and support higher education management decisions and trends nationally and internationally. National higher education systems should rely more on data-based decision making, so on data driven decision support systems (DSS). These systems will surely provide higher education intelligence and performance monitoring urgently needed by the higher education policy makers.

DSS needs comparable data to monitor or benchmark progress of the national education systems, including input and output, nationally or internationally across countries. Fortunately, the United Nations Educational, Scientific and Cultural Organization (UNESCO) in the 1970s developed the International Standard Classification of Education (ISCED) in order to categorise and report both nationally and internationally comparable education statistics [1]. ISCED is first revised in 1997 and its second and current revision has been adopted by UNESCO in 2011. The framework is occasionally updated in order to better capture new developments in education systems worldwide.

The standards on international statistics on education and training systems are set by the three international organisations jointly administering the annual UOE (UNESCO Institute for Statistics, The Organisation for Economic Co-operation and Development (OECD) and The Statistical Office of the European Union (EUROSTAT) data collection.

The UOE data collection on education statistics covers the 28 EU Member States (Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Germany, Estonia, Greece, Spain, France, Ireland, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Malta, Hungary, Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovak Republic, Finland, Sweden and United Kingdom), the EFTA/EEA countries (Iceland, Liechtenstein, Norway and Switzerland), the candidate countries (Albania, North Macedonia, Serbia and Turkey), as well as OECD Member States situated outside Europe (Australia, Canada, Japan, Korea, Mexico, New Zealand, United States) and other countries (e.g. Israel).

The dissemination of education statistics by Eurostat is generally limited to the 28 EU Member States, the EFTA/EEA and Candidate countries. Information on OECD Member States situated outside Europe can be provided by OECD.

Eurostat disseminate education administrative data, besides other categories, from 2013 onwards by using ISCED 2011, even though ISCED 1997 data still are available when needed before 2013. The EUROSTAT education data covers pupils and students – enrolments and entrants, learning mobility, education personnel, education finance, graduates and language learning.

ISCED 2011 (data from 2013 onwards) has nine levels of education, from level 0 to level 8: ISCED 0 (ED 0): Early childhood education, ISCED 1 (ED 1): Primary education, ISCED 2 (ED 2): Lower secondary education, ISCED 3 (ED 3): Upper secondary education, ISCED 4 (ED 4): Post-secondary non-tertiary education, ISCED 5 (ED 5): Short-cycle tertiary education, ISCED 6 (ED 6): Bachelor's or equivalent level, ISCED 7 (ED 7): Master's or equivalent level and ISCED 8 (ED 8): Doctoral or equivalent level.

In this research, ED 6-7-8 levels tertiary education enrolled students [2] will be discussed on gender equity in Austrian and Turkish higher education focusing onto the first level ISCED Fields of Education and Training 2013 (Table 1).

Table 1. ISCED fields of education and training 2013

Code	Fields of education and training
F01	Education
F02	Arts and humanities
F03	Social sciences, journalism and information
F04	Business, administration and law
F05	Natural sciences, mathematics and statistics
F06	Information and Communication Technologies
F07	Engineering, manufacturing and construction
F08	Agriculture, forestry, fisheries and veterinary
F09	Health and welfare
F10	Services

2 Enrolled Students

In this part, first, the students’ numbers of two countries by education level, later by fields of education and training, then gender dimension will be added for the analysis on top of ED 6–8 and ISCED 2013 dimensions.

2.1 Enrolled Students’ Numbers

Data visualisation of numbers usually explain or show patterns of data for variables better than it is expected. Sometimes charts tell almost all the story about data. Following charts, we believe, will explain the story about the enrolled students of Austria and Turkey with no need of many words. Also, in all the charts, for the sake of not to associate colours with gender, blue is used for female (F) and orange is used for male (M) indicators.

Austria’s bachelor’s or equivalent level students are increasing yearly for both gender but decreasing slightly for master’s or equivalent level and in both levels female dominated. In doctoral or equivalent level, numbers are male dominated and slightly decreasing as seen in Chart 1.

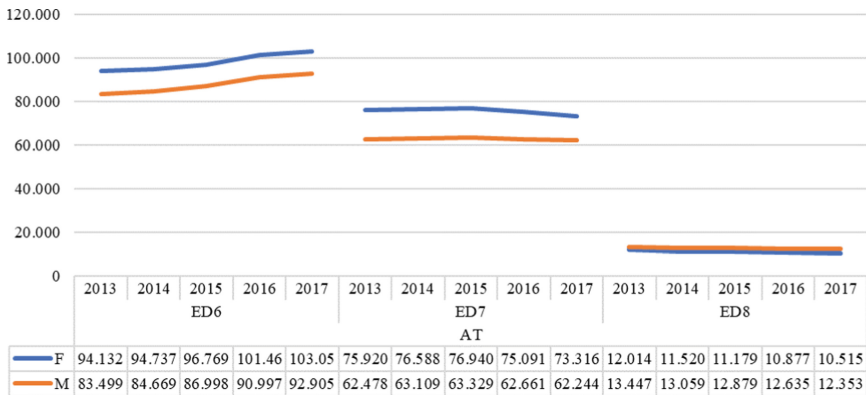


Chart 1. Austrian enrolled students’ number by education level

In Turkey, in every education level, numbers are male dominated and increasing as seen in Chart 2.

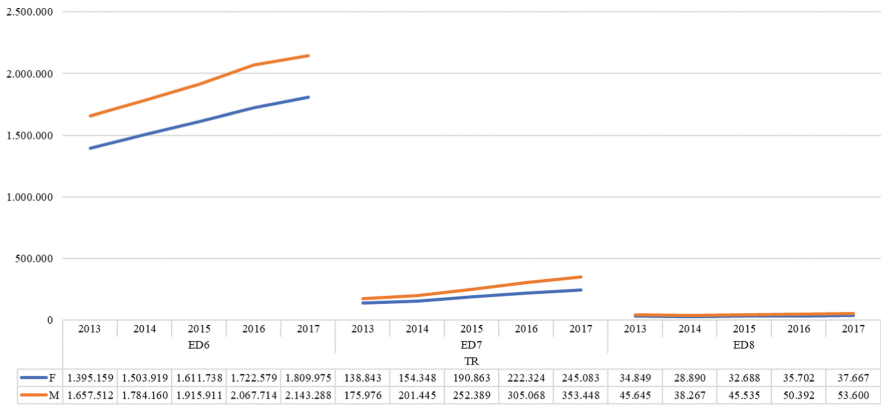


Chart 2. Turkish enrolled students' number by education level

2.2 Enrolled Students' Percentages

In Chart 3, Austrian and Turkish enrolled students' percentage by education level has been shown. ED 6 students' percentage among ED 6–8 in Austria is around %55, but %85 in Turkey, ED 7%38 and %12, ED 8%6.45 and %2 respectively.

Reference [3] states that since the 1970s, the Austrian universities have slowly but steadily become “feminised.”, and the widening participation of women in the tertiary sector led to a substantial increase of female participation at the universities as well. As a result, the rate of women increased, for example, among the first year students from 30% in the academic year 1970/71 to 53% in the academic year 2002/03 as seen Chart 3.

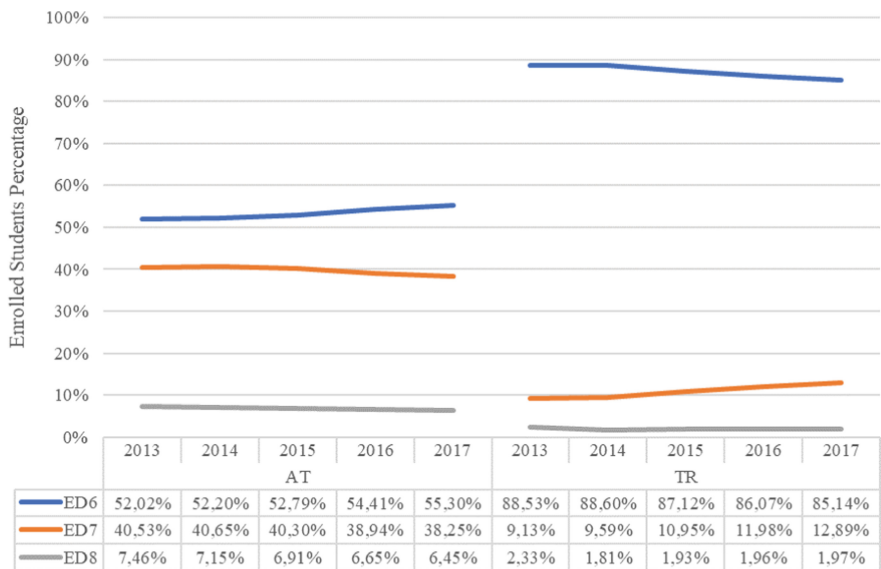


Chart 3. Austrian and Turkish enrolled students' percentage by education level

2.3 Enrolled Students' Numbers and Percentages Based on ISCED 13 by Gender

In Austria, ED 6–8 students' numbers based on ISCED 13 by gender are female dominated in fields F01–F04 and F08–F09 (six out of ten fields) while F04 Business, administration and law has the most female students and F01 education is the most female-dominated, F07 Engineering is the most male-dominated field. It is observed that the number of students in each ISCED field is proportionally distributed, except F08 and F10 (Chart 4).

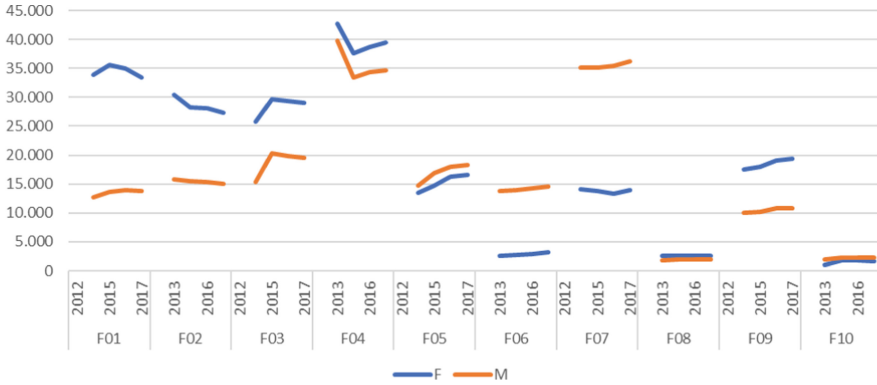


Chart 4. Austrian students' numbers based on ISCED 13 by gender

In Chart 5, we see that Turkish ED 6–8 students' numbers based on ISCED 13 by gender are female dominated in fields F01–F02 and F09 (three out of ten fields) while F04 Business, administration and law has the most male students and F07 Engineering is the second. It is observed that the number of students in each ISCED field is proportionally distributed, except F04.

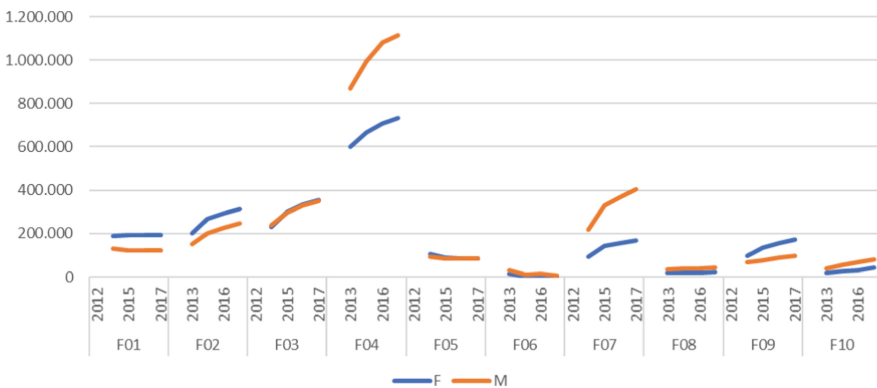


Chart 5. Turkish students' numbers based on ISCED 13 by gender

In Chart 6 we see that in both countries, male students' percentage in ED 8 and ED 7 for Turkey is increasing every year.

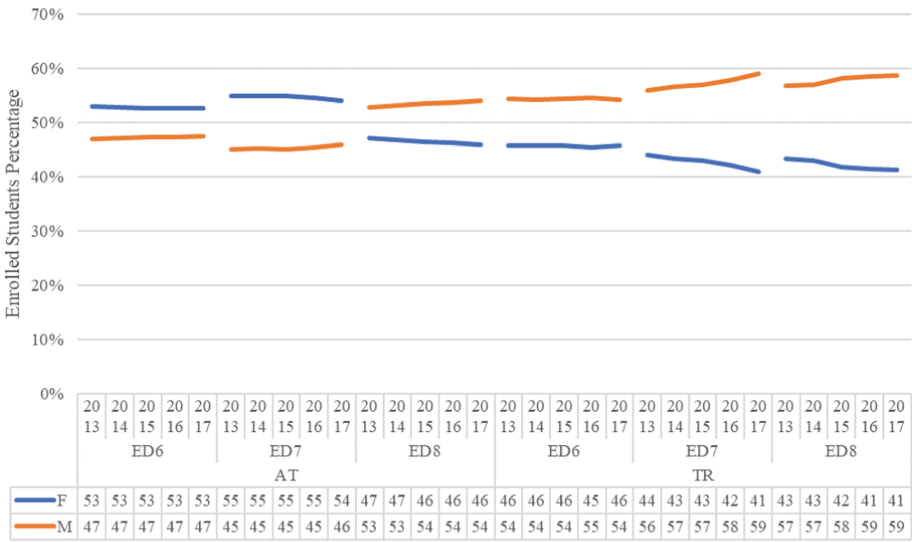


Chart 6. Austrian and Turkish enrolled students’ percentage by education level and gender

2.4 Enrolled Students’ Percentages Based on ED 6–8 by Gender and Fields of Education and Training (2014 Data Was Not Available for Turkey, so 2014 Data Is Not Included)

F01 Education is female dominated field of education and training in every education level in both countries while slightly dominated in ED 7–8 in Turkey (Chart 7).

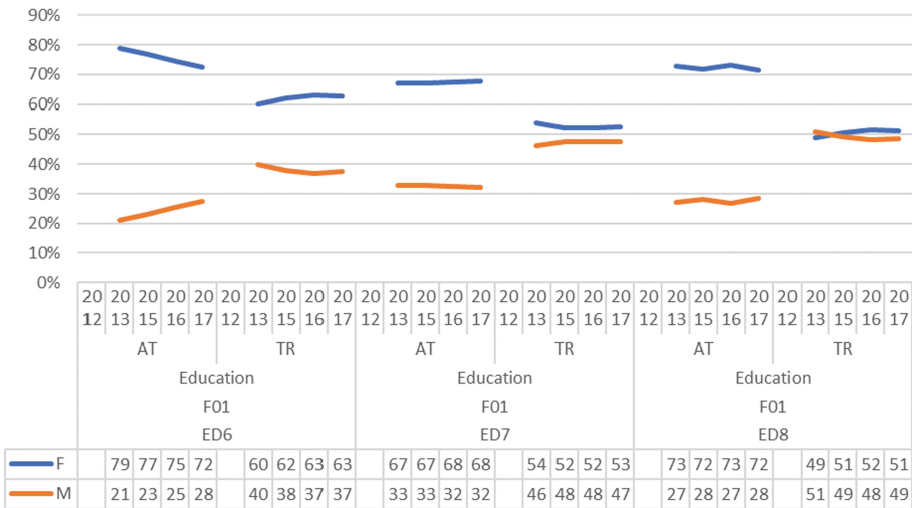


Chart 7. Austrian and Turkish enrolled students’ percentage by education level, education (F01) field and gender

F02 Arts and humanities is female dominated field of education and training in every education level in both countries, except ED 7–8 in Turkey (Chart 8).

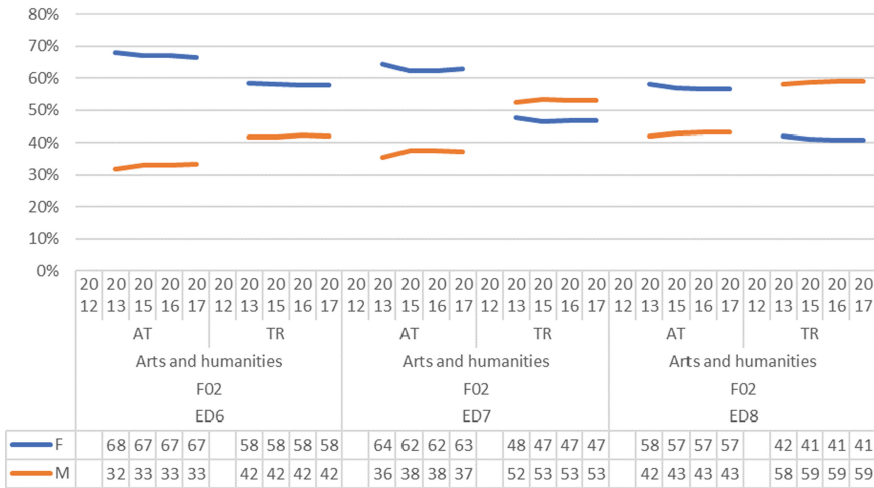


Chart 8. Austrian and Turkish enrolled students’ percentage by education level, F02 field and gender

F03 Social sciences, journalism and information is female dominated field of education and training in every education level in Austria, almost equally dominated in ED 6 and male dominated in ED 7–8 in Turkey (Chart 9).

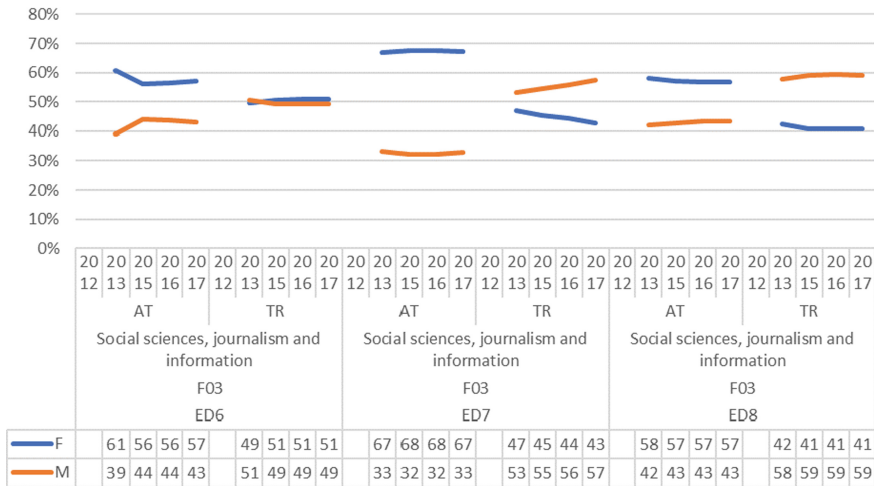


Chart 9. Austrian and Turkish enrolled students’ percentage by education level, F03 field and gender

F04 Business administration and law is female dominated field of education and training in every education level in Austria, except ED 8, male dominated in ED 6–8, with an increasing rate in ED 6 in Turkey (Chart 10).

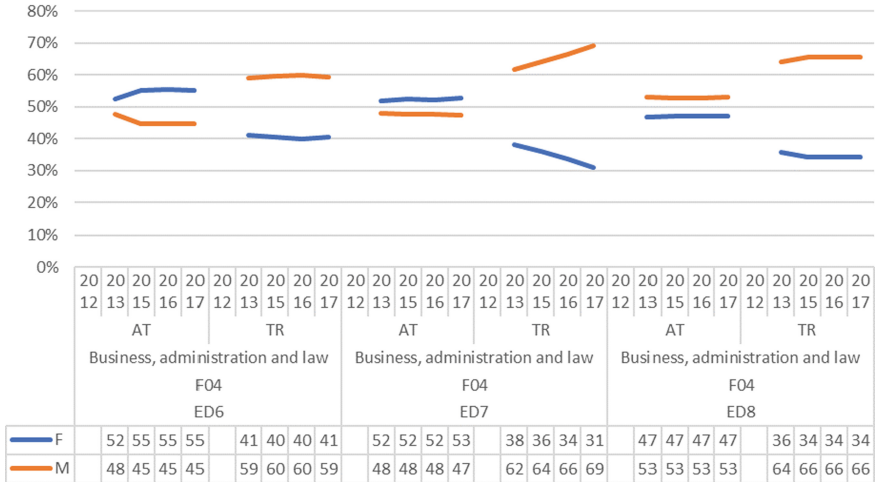


Chart 10. Austrian and Turkish enrolled students’ percentage by education level, F04 field and gender

F05 Natural sciences, mathematics and statistics is equally dominated field of education and training by both gender in every education level in both countries, except ED 8, which is male dominated in Austria (Chart 11).

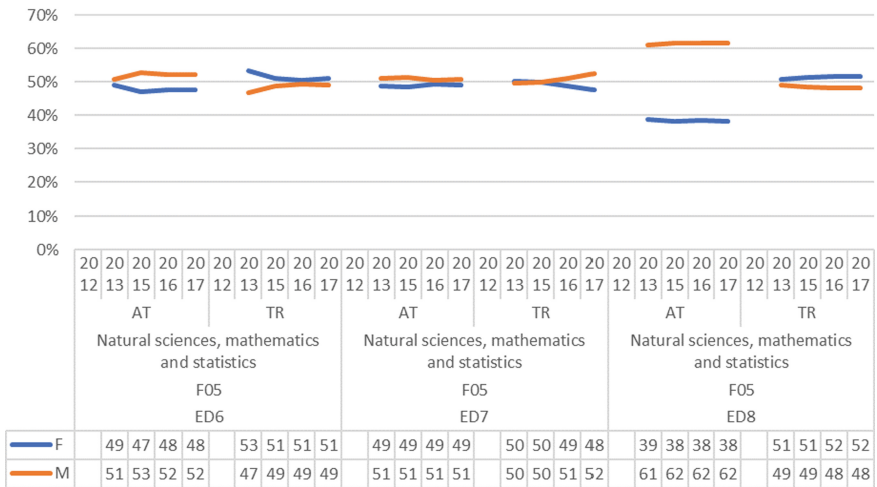


Chart 11. Austrian and Turkish enrolled students’ percentage by education level, F05 field and gender

F06 Information and communication technologies is all male dominated in both countries in every education level with around %80 (Chart 12).

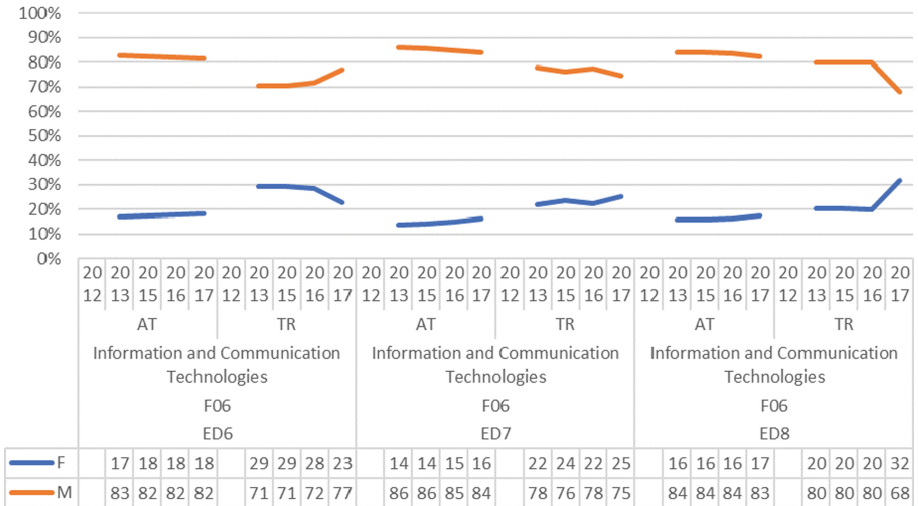


Chart 12. Austrian and Turkish enrolled students’ percentage by education level, F06 field and gender

F07 Engineering, manufacturing and construction is all male dominated in both countries in every education level with around %70 (Chart 13).

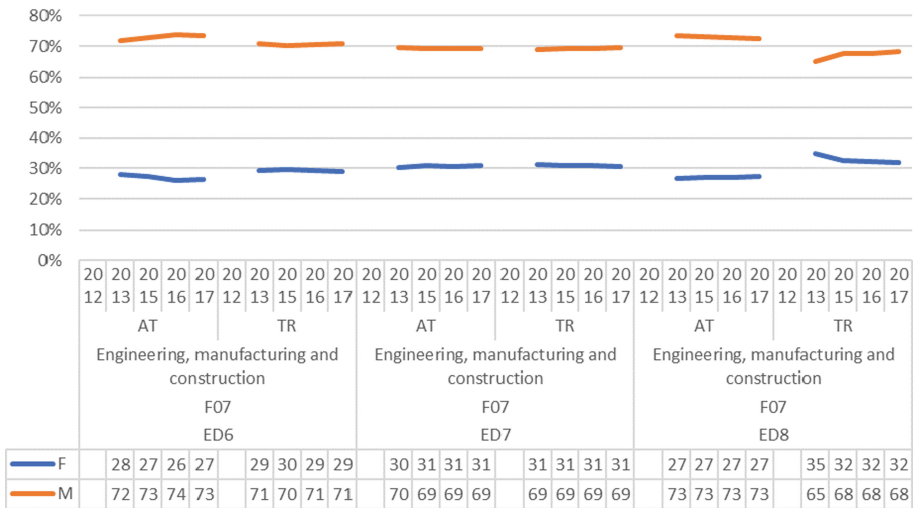


Chart 13. Austrian and Turkish enrolled students’ percentage by education level, F07 field and gender

F08 Agriculture, forestry, fisheries and veterinary is male dominated except, ED 7-8 in Austria (Chart 14).

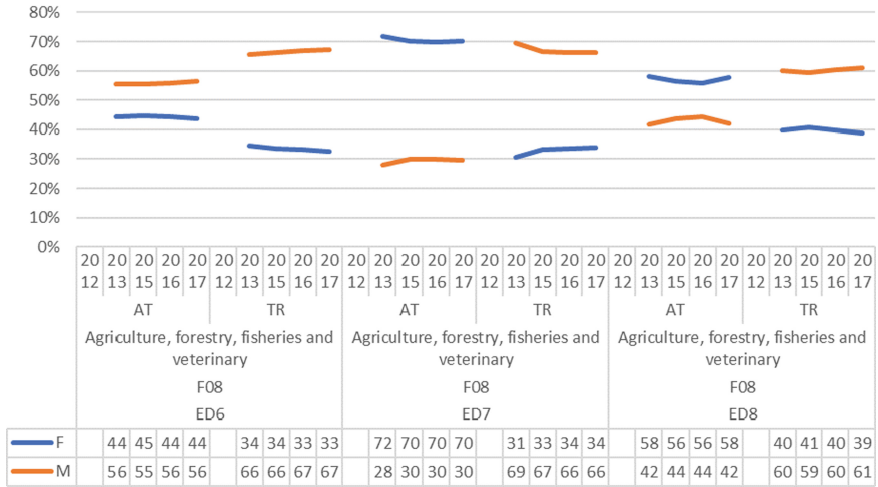


Chart 14. Austrian and Turkish enrolled students’ percentage by education level, F08 field and gender

F09 Health and welfare is a female dominated field of education and training (Chart 15).

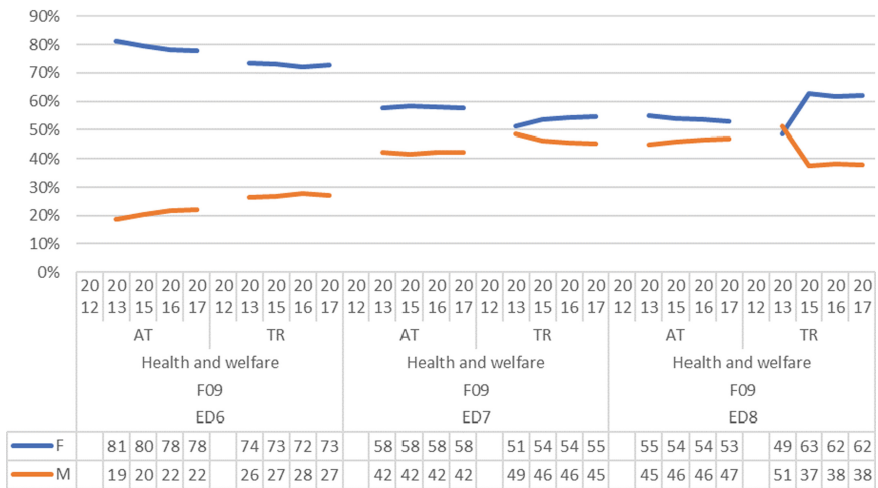


Chart 15. Austrian and Turkish enrolled students’ percentage by education level, F09 field and gender

F10 Services is a male dominated field of education and training (Chart 16).

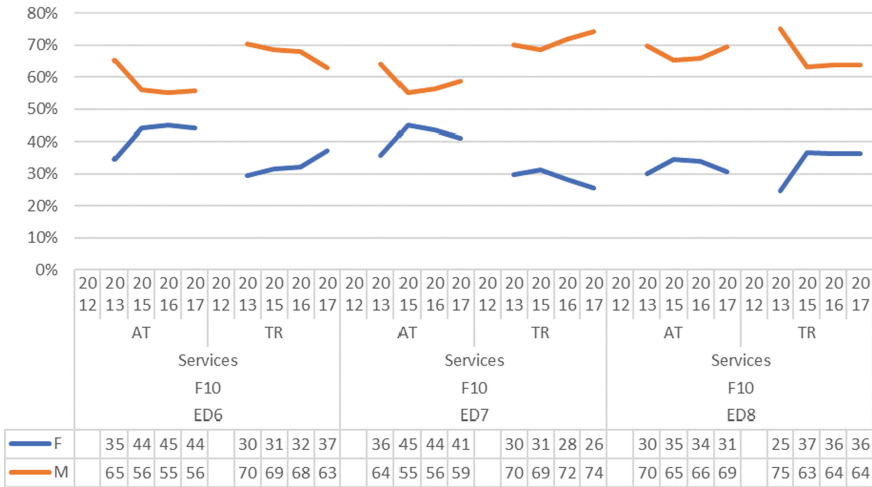


Chart 16. Austrian and Turkish enrolled students’ percentage by education level, F10 field and gender

3 Conclusion

The number of enrolled students of Turkey is very high compared to Austria in ED 6–8. But, in Austria, the female students’ percentage is higher than male students by almost %5 while it is the opposite in Turkey, the male students’ percentage is higher than female students by almost %10.

Reference [4] shows that the integration of Austria into the European Union has helped to reduce gender inequality in universities. If Turkey adapts the European Union policies in gender inequality, the current statistics will favour female students in the next decade.

According to first level ISCED Fields of Education and Training 2013, it is observed that; Education, Health and welfare fields are female while Information and Communication Technologies and Engineering, manufacturing and construction are male dominated. Other fields have mixed results.

Another interesting finding is that in 2017, bachelor’s or equivalent level (ED 6) students’ percentage is %55,30 in Austria, but, 85,14 in Turkey, master’s or equivalent level (ED 7) %38,24 and %12.89, doctoral or equivalent level (ED 8) %6,45 and %1,97 respectively.

A data-driven DSS using EUROSTAT data for all education levels and fields of European countries will be next research subject in order to provide education intelligence for all education policy makers, managers, teachers, academic staff students and families in Europe. In the conference, its prototype will be provided.

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