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The Measurement of Success Distribution with Gini Coefficient

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Abstract: The aim of this study is to calculate and examine the distribution of the academic success of the students of the Faculty of Education academic years between 2014-2019 the courses of statistics and probability with lorenz curve and Gini coefficient. In this regard, Tomul, E [**?**] in Educational Inequality in Turkey: Gini to Evaluate According to the index, Erdem, E., Çoban, S. [**?**] 'provinces in Turkey in Measurement Based Education Inequality and Economic Development Relationship with Difference: Education Gini Explained with coefficients.

Keywords: Academic achievement, Gini coefficient, Lorenz diagram.

1 The importance of the study

The Gini coefficient, developed by the Italian Statistician Corrado Gini (1912), is also used to determine the inequality in economic literature [**?**] because it shows simplicity and distribution with a single coefficient [**?**] and the Gini Coefficient, which is a tool used to measure inequality, in different disciplines including health and education. [**?**].

Gini coefficient of 0 means absolute equality and a value of 1 means absolute inequality. Therefore, decreasing and increasing the coefficient over time indicates the decrease and increase of inequality. In this context; What is the success inequality of Gini Coefficient and how it is distributed according to the lessons and years?

The main questions that the study seeks to answer are: What does the Gini Coefficient Achievement Distribution of Academic Achievement of Elementary Mathematics Teacher Statistics Probability course mean between the academic years of 2014-2019?

The empirical data used in the study may vary in academic terms. The sample of the study was; the academic years between 2014-2019 consists of the number of students. The number of samples between 2014-2019 is the academic achievement data of 112 students. The sample distribution by year is 2014; 36 students, 2015; 16, students, 2016; 7 students, 2017; 6 students, 2018; 28 students, 2019; 19 students

Classes	2014	2015	2016	2017	2018	2019
Statistics and Probability	36	16	7	6	28	19

The Lorenz curve examines the relationship between a certain cumulative share of national income and the cumulative share of those who obtain it. The Lorenz curve is conceptually similar to the percentage slicing method; it relates the cumulative share of income to the cumulative share of individuals, rather than simply determining their share of income. The Lorenz curve is a graphical form that shows how much the percentage income groups receive from the income distribution [**?**]. However; the usefulness of the Lorenz curve helps us to present the inequality in income distribution by a single number, without needing to tell us how much the percentage of individual groups receive.

Gini Coefficient is a non-negative number less than 1. By calculating the area between the Lorenz curve and the 45-degree line giving full equality, a numerical value ranging from 0 to 1, namely the "Gini Coefficient", is found. Where the income distribution is most fair, A = 0. The closer the Gini Coefficient is to 0, the more fair the income distribution is. Family structure of the society, population structure, educational level, tax situation, the structure of the financial sector or industry and development indicators are some factors that may affect the income distribution in a country. In general, the Gini Coefficient, i.e. the income distribution, is interpreted as sufficient after 0.40 and worse after 0.50 [**?**].

In this study, Lorenz curve and the Gini coefficient previously used in an unused area, in the area of measurement and the evaluation of the final stage of evaluation. Between the academic years of 2014 and 2019, the Faculty of Education Mathematics Education in Primary Education teacher candidates Statistics Probability courses of academic achievement was evaluated as data notes.

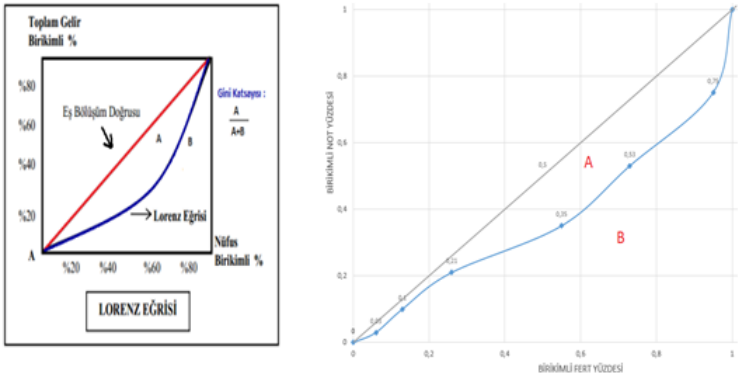

Fig. 1: Lorentz calculation chart of income and academic achievement

The Gini Coefficient Calculation of the Student Success of the year 2014 in Excel

Success Points	fi(student Frequency)	Number of Cumulative Students	percentage of cumulative students	Si(average grade)	cumulative average grade	cumulative grade average percentage	A
0	0	0	0	0	0	0	0
4≤ <17	2	2	0,06	10,5	10,5	0,03	0,000841751
17≤ <30	2	4	0,11	23,5	34	0,10	0,00356742
30≤ <43	4	8	0,22	36,5	70,5	0,203463203	0,01675485
43≤ <56	11	19	0,53	49,5	120	0,346320346	0,083994709
56≤ <69	7	26	0,72	62,5	182,5	0,526695527	0,084876543
69≤ <82	7	33	0,92	75,5	258	0,744588745	0,123597082
82≤ <95	3	36	1,00	88,5	346,5	1	0,072691198
							0,386323553

B	0,386323553
A	0,113676447
A+B	0,5

GİNİ=A/(A+B)=**0,22**7352894

In the results of the study, the academic achievement obtained with the Gini coefficient approach of the Elementary Mathematics Teacher Statistics Probability courses were distributed in the most fair year by year 2014 academic year, and in 2015 it moved away from the fair distribution (gini coefficient; 0.45). , 19 and 0.15 academic achievement (Gini Coefficient in general, i.e. the income distribution, up to 0.40 sufficient, 0.50 are interpreted as bad after we see).

The Geogbra Calculation of 2014

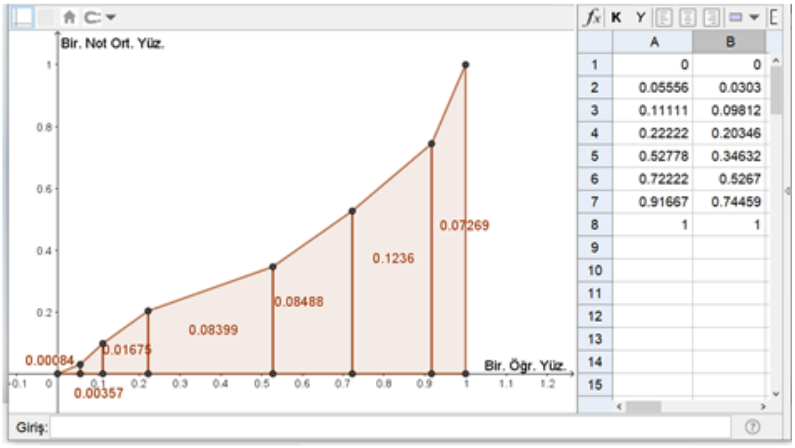

Fig. 2: Trapezoidal areas below the curve(A), A area (0,5- B);B=0,5-0,1136447=0,3863553 Gini=A/A+B = 0,1136447/(0,1136447+0,3863553)=0,227352894

The Gini coefficient of 0.22 is that the elementary mathematics teachers' academic achievement is distributed to students fairly or 36 students share the achievement fairly. If the Gini coefficient is 0.45, it is suggested that the prospective mathematics teacher candidates did not distribute their academic achievement fairly in the courses of Statistics and Probability or 16 students could not share the achievement fairly, but they fit the expected situation in the other years, and further evaluations can be made by following the success of other courses in those years.

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