Gender disparity in admissions into tertiary institutions: Empirical evidence from Nigerian data (2010–2015)

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Abstract

Gender equality in access to higher education is an important factor in building a sustainable world. Although a good number of countries across the globe have achieved parity in primary education between boys and girls, the target is yet to be widely attained at tertiary level of education. In this data article, empirical data on yearly admissions into accredited tertiary institutions in Nigeria are extensively explored to reveal the existence of gender gaps in the national admission process. Details on the number of candidates admitted into all accredited universities, polytechnics, and colleges of education between 2010 and 2015 were obtained directly from the Joint Admissions and Matriculation Board (JAMB). Gender distributions of admitted candidates are analyzed across the thirty-six (36) states of the federation, the Federal Capital Territory (FCT), and the international students’ category. Gender disparity in admissions into Nigerian tertiary institutions are explored using relevant descriptive statistics, box plots, bar charts, line graphs, and pie charts. In addition, Analysis of Variance (ANOVA) is carried out on the historical data to find out if there are significant differences in the arithmetic means of females and males admitted over the six-year period. Furthermore, multiple comparison post-hoc test results are presented in tables to understand the extent of variations (if any) in gender distribution over the years. The robust data exploration reported in this data article will help national regulatory bodies and relevant stakeholders.
in policy formulation and decision making towards ensuring equal
access to higher education in Nigeria.
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Specifications table

| Subject area               | Education          |
|----------------------------|--------------------|
| More specific subject area | Gender gap analysis in tertiary education |
| Type of data               | Tables, charts, and spreadsheet file tables |
| How data were acquired     | Details on the number of candidates admitted into all accredited universities, polytechnics, and colleges of education between 2010 and 2015 were obtained directly from JAMB. |
| Data format                | Secondary, analyzed |
| Experimental factors       | The admission data of universities, polytechnics, and colleges of education that are yet to be accredited by respective national regulatory bodies were excluded. |
| Experimental features      | Gender disparity in admissions into Nigerian tertiary institutions are explored using relevant descriptive statistics, ANOVA, and multiple comparison post-hoc test. The results are presented in form of box plots, bar charts, line graphs, and pie charts. |
| Data source location       | Nigeria, West Africa (Latitude 9.0820°N, Longitude 8.6753°E) |
| Data accessibility         | https://data.mendeley.com/datasets/9w7c3xtv9x/1, https://doi.org/10.17632/9w7c3xtv9x.1 |
| Related research article   | E. Lahelma, “Troubling discourses on gender and education,” Educational Research, vol. 56, pp. 171–183, 2014 [1] |

Value of the data

- Thorough evaluation, correct interpretation, and contextual discussion of the data analyses provided in this data article may speed up the achievement of Goals 4 and 5 of the global Sustainable Development Goals (SDGs) in Nigeria.
- Various research efforts aimed at achieving SDGs 1, 3, 7, 10, and 11, will be intensified if access is granted to more females into Higher Education Institutions, particularly into Science, Technology, Engineering, and Mathematics (STEM) programs.
- The data exploration provided in this data article will call the attention of national regulatory bodies, executives, administrators, and relevant stakeholders to the need for strategic advocacy and promotion of equal access to higher education among all women and men in Nigeria.
- Robust data exploration presented in this data article will help the United Nations (UN) to objectively assess the level of gender disparity in access to higher education in Nigeria.
- The contribution of this data article will further widen the coverage of evidence-based and reproducible research on gender disparity in higher education. In addition, the utility of the data may open doors for new research collaborations on the trends and patterns of enrollment by gender in higher institutions in sub-Saharan Africa.

1. Data

Elimination of gender disparity at all levels of education is one of the major global goals in the pursuit of sustainable development across the globe [1,2]. Although, a good number of countries
Table 1
Descriptive statistics of candidates admitted into Nigerian tertiary institutions (2010–2015).

|        | 2010          | 2011          | 2012          | 2013          | 2014          | 2015          |
|--------|---------------|---------------|---------------|---------------|---------------|---------------|
|        | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male |
| Mean   | 3831.89  | 5475.92    | 993.97  | 1592.76   | 4536.95  | 6256.66  | 4468.68  | 6064.71 | 4160.11  | 5834.45 | 4687.08  | 6247.13 |
| Median | 3587.50  | 5376.00    | 811.50  | 1516.50   | 4062.00  | 6349.50  | 3594.00  | 5827.50 | 3230.50  | 5425.00 | 4209.00  | 5665.00 |
| Mode   | 3.00     | 74.00      | 1420.00 | 24.00     | 45.00    | 0.00     | 13.00    | 23.00   | 25.00    | 23.00   | 20.00    | 20.00   |
| Standard Deviation |          |             |          |             |          |             |          |         |          |         |          |       |
| Variance | $1.19 \times 10^7$ | $1.48 \times 10^7$ | $7.59 \times 10^5$ | $1.23 \times 10^6$ | $1.31 \times 10^7$ | $2.01 \times 10^7$ | $1.33 \times 10^7$ | $1.14 \times 10^7$ | $1.12 \times 10^7$ | $1.11 \times 10^7$ | $1.17 \times 10^7$ | $1.09 \times 10^7$ |
| Kurtosis | 2.63     | 1.83       | 2.70    | 1.99       | 2.34     | 2.97       | 2.80     | 1.93     | 2.14     | 1.86     | 2.31     | 2.08    |
| Skewness | 0.75     | 0.35       | 0.73    | 0.35       | 0.57     | 0.53       | 0.75     | 0.13     | 0.57     | 0.14     | 0.51     | 0.13    |
| Range   | 12,598   | 12,922     | 3223    | 3946       | 13,069   | 18,996     | 14,311   | 12,650   | 11,253   | 12,375   | 13,073   | 12,602   |
| Minimum | 3        | 74         | 21      | 24         | 45       | 0          | 13       | 23       | 25       | 23       | 20       | 20      |
| Maximum | 12,601   | 12,996     | 3244    | 3970       | 13,114   | 18,996     | 14,324   | 12,673   | 11,278   | 12,398   | 13,093   | 12,622   |
| Sum     | 145,612  | 208,085    | 37,771  | 60525      | 172,404  | 237,753    | 169,810  | 230,459  | 158,084  | 221,709  | 178,109  | 237,391  |
across the globe have achieved parity in primary education between boys and girls, the target is yet to be widely attained at tertiary level of education [3,4]. In this data article, empirical data on yearly admissions into accredited tertiary institutions in Nigeria are extensively explored to reveal the existence of gender gaps in the national admission process. Thorough evaluation, correct interpretation, and contextual discussion of the data analyses provided in this data article may speed up the achievement of Goals 4 and 5 of the global Sustainable Development Goals (SDGs) in Nigeria. The data exploration provided in this data article will call the attention of national regulatory bodies, executives, administrators, and relevant stakeholders to the need for strategic advocacy and promotion of equal access to higher education among all women and men in Nigeria. Robust data exploration presented in this data article will help the United Nations (UN) to objectively assess the level of gender disparity in access to higher education in Nigeria. The contribution of this data article will further widen the coverage of evidence-based and reproducible research on gender disparity in higher education. In addition, the utility of the data may open doors for new research collaborations on the trends and patterns of enrollment by gender in higher institutions in sub-Saharan Africa.

The basic features of the quantitative data on yearly admissions into all accredited Nigerian universities, polytechnics, and colleges of education between 2010 and 2015 were described using eleven (11) different statistical parameters namely: mean, median, mode, standard deviation, variance, kurtosis, Skewness, range, minimum value, maximum value, and the sum. The descriptive statistics of

![Graph showing gender distribution of higher education enrollment in 2010.](image-url)

**Fig. 1.** Gender distribution of higher education enrollment in 2010.
the number of candidates admitted are computed for two gender category (i.e. female and male) and
the results obtained are presented in Table 1. The results of the descriptive statistics showed that
there is gender disparity in admissions into tertiary institutions in Nigeria. In each of the six-year
period, the number of males admitted into the various higher institutions of learning in Nigeria is
consistently higher than that of their female counterparts.

Also, the gender distributions of admitted candidates were analyzed across the thirty-six (36)
states of the federation, the Federal Capital Territory (FCT), and the international students’ category.
The distributions of enrollment in higher education for the period of six years (2010–2015) are shown
in Figs. 1–6 respectively. In order to gain better understanding of the trends and patterns of the
gender inequality, the numbers of females and males admitted were plotted against the years of
admission as shown in Fig. 7.

The proportions of females and males in admissions into Nigerian tertiary institutions are
depicted using pie charts shown in Fig. 8. The male gender continuously dominated the admis-
sions into higher education over the six-year period. ANOVA test was carried out on the historical
data to find out if there are significant differences in the arithmetic means of females and males
admitted over the six-year period. The source of variation, sum of squares, degree of freedom,
mean squares, F-statistic, and the p-value are presented for each of the six-year period in
Tables 2–7 respectively. Additional information on the variations between the arithmetic means
over the years may be obtained from the boxplot representations shown in Figs. 9–14. Further-

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![Gender distribution of higher education enrollment in 2011.](image-url)
more, multiple comparison post-hoc test results are presented in Table 8 to understand the extent of variations (if any) in gender distribution over the years. Here, information about the lower limits for 95% confidence intervals, mean difference, upper limits for 95% confidence intervals, and p-value are provided.

2. Experimental design, materials, and methods

Details on the number of candidates admitted into all accredited universities, polytechnics, and colleges of education between 2010 and 2015 were obtained directly from the Joint Admissions and Matriculation Board (JAMB). Gender distributions of admitted candidates are analyzed across the thirty-six (36) states of the federation, the Federal Capital Territory (FCT), and the international students’ category. Gender disparity in admissions into Nigerian tertiary institutions are explored using relevant descriptive statistics, box plots, bar charts, line graphs, and pie charts.
Fig. 4. Gender distribution of higher education enrollment in 2013.

Fig. 5. Gender distribution of higher education enrollment in 2014.
Fig. 6. Gender distribution of higher education enrollment in 2015.

Fig. 7. Time series plot of higher education enrollment by gender.
Fig. 8. Proportions of females and males in admissions into Nigerian tertiary institutions.

Table 2
Gender gap ANOVA results of enrollment in 2010.

| Source of variation | Sum of squares | Degree of freedom | Mean squares | F statistic | Prob > F |
|---------------------|----------------|-------------------|--------------|------------|----------|
| Columns             | 5.14 \times 10^7 | 1                 | 5.14 \times 10^7 | 3.85       | 0.0536   |
| Error               | 9.88 \times 10^8 | 74                | 1.34 \times 10^7 |            |          |
| Total               | 1.04 \times 10^9 | 75                | 1.34 \times 10^7 |            |          |

Table 3
Gender gap ANOVA results of enrollment in 2011.

| Source of variation | Sum of squares | Degree of freedom | Mean squares | F statistic | Prob > F |
|---------------------|----------------|-------------------|--------------|------------|----------|
| Columns             | 6.81 \times 10^6 | 1                 | 6.81 \times 10^6 | 6.85       | 0.0107   |
| Error               | 7.36 \times 10^7 | 74                | 9.94 \times 10^5 |            |          |
| Total               | 8.04 \times 10^7 | 75                | 9.94 \times 10^5 |            |          |

Table 4
Gender gap ANOVA results of enrollment in 2012.

| Source of variation | Sum of squares | Degree of freedom | Mean squares | F statistic | Prob > F |
|---------------------|----------------|-------------------|--------------|------------|----------|
| Columns             | 5.62 \times 10^7 | 1                 | 5.62 \times 10^7 | 3.39       | 0.0697   |
| Error               | 1.23 \times 10^9 | 74                | 1.66 \times 10^7 |            |          |
| Total               | 1.28 \times 10^9 | 75                | 1.66 \times 10^7 |            |          |
### Table 5
Gender gap ANOVA results of enrollment in 2013.

| Source of variation | Sum of squares | Degree of freedom | Mean squares | F statistic | Prob > F |
|---------------------|----------------|-------------------|--------------|------------|----------|
| Columns             | $4.84 \times 10^7$ | 1                 | $4.84 \times 10^7$ | 3.92      | 0.0515   |
| Error               | $9.14 \times 10^6$ | 74                | $1.23 \times 10^7$ |           |          |
| Total               | $9.62 \times 10^6$ | 75                |              |            |          |

### Table 6
Gender gap ANOVA results of enrollment in 2014.

| Source of variation | Sum of squares | Degree of freedom | Mean squares | F statistic | Prob > F |
|---------------------|----------------|-------------------|--------------|------------|----------|
| Columns             | $5.33 \times 10^7$ | 1                 | $5.33 \times 10^7$ | 4.78      | 0.032    |
| Error               | $8.25 \times 10^6$ | 74                | $1.11 \times 10^7$ |           |          |
| Total               | $8.78 \times 10^6$ | 75                |              |            |          |

### Table 7
Gender gap ANOVA results of enrollment in 2015.

| Source of variation | Sum of squares | Degree of freedom | Mean squares | F statistic | Prob > F |
|---------------------|----------------|-------------------|--------------|------------|----------|
| Columns             | $4.62 \times 10^7$ | 1                 | $4.62 \times 10^7$ | 4.09      | 0.0468   |
| Error               | $8.37 \times 10^6$ | 74                | $1.13 \times 10^7$ |           |          |
| Total               | $8.84 \times 10^6$ | 75                |              |            |          |

![Boxplot representation of enrollment in 2010.](image)

**Fig. 9.** Boxplot representation of enrollment in 2010.
Fig. 10. Boxplot representation of enrollment in 2011.

Fig. 11. Boxplot representation of enrollment in 2012.
Fig. 12. Boxplot representation of enrollment in 2013.

Fig. 13. Boxplot representation of enrollment in 2014.
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Transparency document. Supporting information

Transparency document associated with this article can be found in the online version at https://doi.org/10.1016/j.dib.2019.01.031.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at https://doi.org/10.1016/j.dib.2019.01.031.
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