Matura Exams in Kosovo: An Analysis on 2014 Test Results

Honors Project

Genta Agaj
Supervisor: Dr. Brian Bowen
Technical Advisor: Mrika Kotorri
Presentation Outline

- Methodology
- Background Information on Standardized tests
- Normality Check
- Analysis of Variance (ANOVA) Test
- Regression Equation
- Recommendations and Conclusion
Methodology

- Obtain the State Matura Exam scores
- Municipality Education Directorate (MED)
- Sample size: 3,267 (out of 5,284)
- Minitab was used as a statistical software
Any test that is “administered and scored in a predetermined, standard manner” (Popham, 1999).

Standardized test results have a Normal Distribution

"The State Matura" is the standardized final exam, monitored and assessed in order to prove the completion of the upper secondary school level and proves the level of knowledge of the candidate for work and continuing the tertiary education in harmony with corresponding enrollment procedures.

The tests are composed out of two sections:
1. General section (120 points)
2. Concentration-based section (80 points)
Normality Check

Summary for English

Andersen-Darling Normality Test
- A-Squared: 36.97
- P-Value <: 0.005

Summary for English (outliers removed)

Andersen-Darling Normality Test
- A-Squared: 35.64
- P-Value <: 0.005

Summary for Math

Andersen-Darling Normality Test
- A-Squared: 56.58
- P-Value <: 0.005
What does it mean for students?
What does it mean for universities?
Why the distribution is not normal?
How to make the distribution normal?
ANOVA Test on Scores - General Section

<table>
<thead>
<tr>
<th>School</th>
<th>Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milleniumi i 3te</td>
<td>90.31</td>
</tr>
<tr>
<td>Zeniti</td>
<td>85</td>
</tr>
<tr>
<td>Xhevded Doda</td>
<td>79.72</td>
</tr>
<tr>
<td>Sami Frasheri</td>
<td>78.88</td>
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<tr>
<td>Luarasi</td>
<td>78.2</td>
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<tr>
<td>American School of Kosova</td>
<td>77.2</td>
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<tr>
<td>Don Bosko</td>
<td>76.97</td>
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<tr>
<td>Prenk Jakova</td>
<td>65.52</td>
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<tr>
<td>Eqrem Qabej</td>
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</tr>
<tr>
<td>Universum</td>
<td>65.27</td>
</tr>
<tr>
<td>Hoxhe Kadri Prishtina</td>
<td>56.67</td>
</tr>
<tr>
<td>28 Nentori</td>
<td>46.03</td>
</tr>
</tbody>
</table>

| Mean                           | 76.97  |

Tukey Test Grouping

<table>
<thead>
<tr>
<th>Number of students</th>
<th>A</th>
<th>A B</th>
<th>B</th>
<th>B</th>
<th>ABC</th>
<th>B C</th>
<th>B C</th>
<th>D</th>
<th>D</th>
<th>CDE</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Yes</td>
<td></td>
</tr>
<tr>
<td>General</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Mixed</td>
<td>Yes</td>
<td>Mixed</td>
<td>Yes</td>
<td>Mixed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>11</td>
<td>368</td>
<td>866</td>
<td>15</td>
<td>40</td>
<td>220</td>
<td>50</td>
<td>209</td>
<td>15</td>
<td>926</td>
<td>525</td>
</tr>
</tbody>
</table>

Tukey Test Grouping:
- A
- A B
- B
- B
- ABC
- B C
- B C
- D
- D
- CDE
- E
- F
ANOVA Test on Scores - Albanian Section

### Scores in Albanian

<table>
<thead>
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<th>Scores</th>
</tr>
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<tbody>
<tr>
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<td>34.962</td>
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<tr>
<td>Zeniti</td>
<td>31.636</td>
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<tr>
<td>Luarasi</td>
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<td>Xhevded Doda</td>
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<td>Sami Frasheri</td>
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<td>Don Bosko</td>
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<td>Eqrem Qabej</td>
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<td>Universum</td>
<td>24.733</td>
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<tr>
<td>Prek Jakova</td>
<td>24.500</td>
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<tr>
<td>American School of Kosova</td>
<td>23.125</td>
</tr>
<tr>
<td>Hoxhe Kadri Prishtina</td>
<td>21.793</td>
</tr>
<tr>
<td>28 Nentori</td>
<td>17.678</td>
</tr>
</tbody>
</table>

#### Tukey Test Grouping

<table>
<thead>
<tr>
<th>Grouping</th>
<th>A</th>
<th>ABC</th>
<th>BCD</th>
<th>DEF</th>
<th>EF</th>
<th>BD</th>
<th>BD</th>
<th>CG</th>
<th>FG</th>
<th>HI</th>
<th>I</th>
<th>J</th>
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<tbody>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of students</td>
<td>26</td>
<td>11</td>
<td>15</td>
<td>364</td>
<td>866</td>
<td>220</td>
<td>209</td>
<td>15</td>
<td>50</td>
<td>40</td>
<td>926</td>
<td>525</td>
</tr>
<tr>
<td>Private</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General</td>
<td>Yes</td>
<td>Yes</td>
<td>Mixed</td>
<td>Yes</td>
<td>Yes</td>
<td>Mixed</td>
<td>Yes</td>
<td>Mixed</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: The table above shows the mean scores for each school, the Tukey Test Grouping, the number of students, and the private or general status of each school.
Analysis and Discussion

- Limitation – calculations are done from a sample
- Focus on ANOVA’s use as a tool instead of the comparisons
- The benefit of publishing online ANOVA results:
  1. Benefits to students
  2. Benefits to parents
  3. Benefits to schools (especially private)
  4. Benefits to Municipality
“School” tested whether being a student in “Xhevded Doda” means performing better;

“Gender” tested whether females perform better than males;

“Private/Public Education” tested whether private schools have performed better than the public schools;

“Average Student per Class” tested whether a larger class size have higher scores than a smaller class size.
Recommendations

Limitations – too little variables used
Coefficient of Determination is 13.8%

Recommendations – add more variables such as: GPA, parental income, parental education, school’s budget per student, the amount of cheating on the test day, etc.
Conclusion

- Normality Check
  - Test the questions beforehand
- ANOVA
  - Make the results public
- Regression Equation
  - Expand it further
Constitution of Kosovo. Law No. 04/L-032 on Education.
Constitution of Kosovo. Law No. 03/L-018 on Final Exam and State Matura Exam.
Thank You

Feel free to ask any question