The Impact of School Infrastructure on the Performance of Pupils

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Abstract: The performance of schools, regardless of the level of training, is given by the quality of the teachers but also of the students. This article has assumed that material resources in schools have a significant influence on pupils' performance, and in this respect we have used: investigation of secondary sources and correlation. The most important conclusions of the article show that the school infrastructure (the number of computers and laboratories) in the educational units has a direct and strong impact on the promotion of primary and secondary education.

Keywords: performance; pupils; educational units.

1. The study of knowledge

Performance is regarded as a directed behavior, a set of mental processes generating a series of actions [4]. Hughes, Ginnelt, and Curphy believe that performance is made up of all the behaviors aimed at achieving the objectives of the organization [1]. The determinants of performance according to Engelmann C and Roesch R are the following [2]:

1) the role of each member;
2) the cohesion of individuals;
3) communication mechanism;
4) the homogeneity of members

The performance of the school organizations is given by the level of training of the teachers and of the persons with a leading position, as well as by the results obtained by the students at: competitions, olympics, the capacity examination.

2. The Impact of School Infrastructure on Student Performance

2.1. Materials and methods

The research method used is the indirect one. Local statistical sources are being investigated, but also the use of a quantitative method - the correlation. The data from the local public statistics analyzed the evolution of indicators reflecting the school infrastructure: the number of laboratories and computers in the school organizations at primary and secondary level in Dâmboviţa County. It also presents the evolution of the number of graduates in primary and secondary education. The time period analyzed - the years 2013-2015.

Objectives pursued:

O1: Knowledge of the evolution of relevant indicators of school infrastructure;

O2: Identify the impact of school and computer labs on school on the number of graduates.

Assumptions:

H1: The number of graduates in Dâmboviţa County at the level of primary and secondary education has evolved over the last years;
H2: There is a direct link between the school infrastructure of the Dambovita education units and the number of graduates.
2.2. Statistical analysis of the school infrastructure

The school infrastructure is reflected by the indicators: the number of computers and the number of laboratories, and the school performance by the indicator - the number of graduates in primary and secondary education. These indicators are presented in Table 1, Table 2 and Table 3.

Table 1. Number of computers used in school organizations

<table>
<thead>
<tr>
<th>Training levels</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2013</td>
</tr>
<tr>
<td>Primary and secondary education</td>
<td>131860</td>
</tr>
</tbody>
</table>

Source: insee.ro [3]

Each indicator under analysis is presented in terms of relative and absolute dynamics.

Absolute Dynamics
Number of computers = number of computers 1 - number of computers
Number of computers = 133466 - 131860, Number of computers = 1606. This result shows that within three years there is an increase in the number of computers by 1606.

Relative Dynamics
Growth index =
Growth Index = (133466/131860) * 100, Growth Index = 101%. The 101 figure shows an increase in the number of computers from 2013 to 2015.

Table 2. Number of graduates

<table>
<thead>
<tr>
<th>Training levels</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year 2012</td>
</tr>
<tr>
<td>Primary and secondary education</td>
<td>4759</td>
</tr>
</tbody>
</table>

Source: insee.ro [3]
Absolute Dynamics
Number of graduates = number of graduates1 - number of graduates0
Number of graduates = 4831-4759, Number of graduates = 72, there is an increase of 1606.
Relative Dynamics
Growth index =
Growth Index = (4831/4759) * 100, Growth Index = 101%. The figure of 101 shows an increase from 2013 to 2015 of the number of graduates in primary and secondary education.

Table 3. Number of laboratories in primary and secondary education

<table>
<thead>
<tr>
<th>Levels of training</th>
<th>Years</th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>2013</td>
<td>2014</td>
<td>2015</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>UM: Number</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary and secondary education</td>
<td>201</td>
<td>208</td>
<td>203</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: insee.ro

Absolute Dynamics
number of laboratories = number of laboratories1 - number of laboratories
number of laboratories = 203-201, Number of laboratories = 2. Within three years there is an increase in the number of laboratories by 1606.
Relative Dynamics
Growth index =
Growth Index = (133466/131860) * 100, Growth Index = 101%. The 101 value shows an increase in the number of computers from 2013 to 2015

2.3. Analysis of the Impact of School Infrastructure on Student Performance

Correlation is used to describe the type and intensity of the link between variables subject to this analysis. The calculation data are presented in Table 4.

Table 4. Calculation data

<table>
<thead>
<tr>
<th>Years</th>
<th>$x_1$</th>
<th>$x_2$</th>
<th>$y$</th>
<th>$x_1 x_2$</th>
<th>$x_1^2$</th>
<th>$x_2^2$</th>
<th>$x_1 y$</th>
<th>$x_2 y$</th>
<th>$y^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>201</td>
<td>131860</td>
<td>4759</td>
<td>26503860</td>
<td>1738705960</td>
<td>0</td>
<td>956559</td>
<td>627521740</td>
<td>2264808</td>
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<td></td>
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<td></td>
<td>1</td>
</tr>
<tr>
<td>2014</td>
<td>208</td>
<td>131564</td>
<td>4757</td>
<td>27365312</td>
<td>1730908609</td>
<td>6</td>
<td>989456</td>
<td>625849948</td>
<td>2262904</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9</td>
</tr>
</tbody>
</table>
X1, the first variable is the number of labs
X2, the second variable is the number of computers,
X3, the last variable is the number of graduates of primary and secondary education.

The first two are causal variables, and the latter is the resultant variable. For the purpose of identifying the impact between variables, the correlation ratio $R_y / x_1 / x_2$ is used, and it is calculated using three statistical coefficients: $r_{yx1}$, $r_{yx2}$, $r_{x1x2}$.

The intensity of the link between the two causal variables $x_1$, $x_2$ and the resultant variable was achieved by calculating the correlation ratio because it is a second degree function.

Analyzing the first correlation coefficient ($r_{yx1}$) demonstrates the lack of links between the number of school labs and the number of graduates in primary and secondary education (-0.26). The influence of the computer number on the studied phenomenon is reflected by the second
correlation coefficient (ryx2), and the result of 0.99 shows the existence of a deterministic link.

$\text{rx1 \times x2}$ - The use of the third correlation coefficient, that of causal variables, shows that there is insignificant but indirect influence (fact supported by the minus sign in front of the obtained value).

The correlation report resulting from the calculation of the three coefficients indicates the existence of a direct and strong link between the school infrastructure and the performance of the primary and secondary school pupils in Dâmboviţa County.

3. Conclusions

The dynamic (relative and absolute) analysis of school infrastructure indicators and performance shows a steady evolution of these indicators. The first hypothesis that the number of graduates increased from 2013 to 2015 was confirmed. There is a direct and strong link between the school infrastructure and the number of graduates (the second hypothesis is confirmed). In conclusion, the school performance of students at exams and competitions is influenced by the level of endowment of the education units.

References


