Interdisciplinarity: Ways to Improve Data and Statistical Literacy

How to teach smart and attentive use of data and numbers
(Master for Data Analysis for Business Intelligence at Turin—Italy)

Flavio Bonifacio, Metis Ricerche srl, Turin - e-mail: flavio.bonifacio@metis-ricerche.it, Mobile: +393487091917

Usually we observe different and opposite opinions about numbers. On one side numbers are presented as the ultimate warrant of objectivity and definitive truth. On the other side we often hear people say that numbers are used to prove what we want to prove, operating in an arbitrary way. That is true: with numbers we prove everything we want to prove, because it is exactly what we want. It would be surprising if with numbers we proved what we did not want to prove.

“As far as the propositions of mathematics refer to reality, they are not certain; and as far as they are certain, they do not refer to reality”, A. Einstein

“Although this may seem a paradox, all exact science is based on the idea of approximation. If a man tells you he knows a thing exactly, then you can be safe in inferring that you are speaking to an inexact man”, B. Russel

**Numbers as symbols to... interpret dreams**

The Neapolitan World of numbers for the Neapolitan world

The Dead Man that speaks

**Numbers as symbols to... track down a treasure**

Between quality and quantity: The Gold-Bug

In the novel Poe tracks down a treasure using a cryptogrammed map

53&81305(6*:48264)&(806*488960)85&18(;&*8!83(88)5*;46(;88*97*8)&(485);5*12:*8&(4956*2(5*-
4)898*;...

**Numbers as symbols to... count in many ways**

The binary World of numbers for the computer bittips (two) World

The Decimal World of numbers for the human fingertips (ten) World

<table>
<thead>
<tr>
<th>Character</th>
<th>8</th>
<th>occurs</th>
<th>33</th>
<th>times</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot; &quot;</td>
<td>&quot; &quot;</td>
<td>26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot; &quot;</td>
<td>4</td>
<td>19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>} )</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot; ... &quot;</td>
<td>&quot; ... &quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Different counts for different goals**

As an example, we consider the influence of the way to count on results. We examine the case of local election in Sicily in 2006 and in 2012

<table>
<thead>
<tr>
<th>Year</th>
<th>Absolute Value</th>
<th>%</th>
<th>Votes for Democratic Party Candidate (PD)</th>
<th>Total of valid votes</th>
<th>Results for Democratic Party (PD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>1,078,079</td>
<td>41.63</td>
<td>2,589,430</td>
<td>Lost</td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>617,073</td>
<td>30.90</td>
<td>2,203,885</td>
<td>Won</td>
<td></td>
</tr>
</tbody>
</table>

If we count the percentage of votes and compare the percentage obtained by the PD and the percentages obtained by other Parties in 2012, the PD won because, in relative terms, the PD had more votes than the others.

If we count percentage and absolute value and compare them to the ones obtained in 2006, the PD lost more than 400,000 supporters. The final question about these data is: did the PD perform better in 2006 or in 2012?

**SOLUTION**

Interdisciplinarity: the way to teach at the Master for Data Analysis for Business Intelligence (DABI) at Turin Designed and conducted by Metis Ricerche with University of Turin and the partnership of COREP

The teaching methodology changes the traditional view. On the vertical plane it reverses the propaedeutics and begins from the bottom, from the pragmatic and operational level which builds the theoretical knowledge on the bases of practical urgency. On the horizontal plane, it blends and crosses skills coming from different branches of knowledge in a genuinely interdisciplinary way with substantive competence in several fields, in turn economic, sociological, managerial, etc.; methodological knowhow which serves to structure problems and to design research projects; statistical literacy that knows how to link concepts to real things through numbers; the necessary ICT competence that knows how to link the computing procedures to data — i.e. what Americans call Business Intelligence.

Students asking to access the Master DABI controlled by some variables — The demand is interdisciplinary

---

**IAASSIST 2013 CONFERENCE, 28-31 May in Cologne, Germany**

**Interdisciplinarity: Ways to Improve Data and Statistical Literacy**

**How to teach smart and attentive use of data and numbers**

(Master for Data Analysis for Business Intelligence at Turin—Italy)

Flavio Bonifacio, Metis Ricerche srl, Turin - e-mail: flavio.bonifacio@metis-ricerche.it, Mobile: +393487091917