Análisis de datos: más caro no implica mejor

Data analysis: more expensive does not imply better

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Data analysis in medical education and the broader education sector – whether quantitative, qualitative, or some combination thereof – has been dominated by commercial software packages. This decades-long tradition has persisted in recent years despite the presence of freely available Open-Source alternatives that enable the same types of quantitative and/or qualitative analyses and more than that.

One of these alternatives, *jamovi* (1), is a statistical program with a graphical user interface (GUI) like common commercial software, that has been recommended widely and in this journal (2). Another alternative, which enables a wide range of quantitative and qualitative analyses, is found in *Orange* (3). Although *Orange* does not come with the same type of GUI as *jamovi*, researchers can do analyses via GUI-and-figure (draw-and-drag) combinations that, like *jamovi*, do not require any kind of programming. This is important because traditionally an argument against freely available Open-Source software has been that knowledge of some programming language, such as *R* (4), was needed. Programs like *jamovi* and *Orange* reduce this argument to a thing of the past.

Combining *jamovi* and *Orange*, researchers can run nearly all types of quantitative and qualitative analyses that medical education researchers have been running with commercial software. In addition, for quantitative analysis, *jamovi* offers a range of methods that are either not implemented in popular commercial software or return incorrect outcomes (5). Finally, *jamovi* offers the possibility to run *R* from within *jamovi*: (i.) for any analysis that is already included in *jamovi*, users have the option of seeing the *R* code for that same analysis in *R*, and (ii.) for analyses *not* yet included in *jamovi*, such as statistical methods for single-case designs (6), users who have installed *R* on their device can run *R* from within *jamovi* and get exactly the same output in *jamovi* as they would get in *R*. This way, researchers can run all types of quantitative and qualitative analyses that medical education researchers have been running with commercial software, plus a wide variety of analyses more, including analyses that are included in other freely available Open-Source software (5).

Investing in software licenses would be defensible if commercial software was superior to freely available Open-Source alternatives or if these alternatives were too difficult to handle for many potential users. However, programs such as *jamovi* and *Orange* make the same and more analyses accessible regardless of the individual user's experience with commercial software. In this line, an important ethical argument in favor of freely available Open-Source software is that it is *inclusive*: everyone can use it. To conclude, given the current state of freely

available Open-Source software, there is no need for institutions or individual researchers to continue allocating part of their budget to software licenses that exclude those of us who cannot afford them and that offer at best *part* of the universe of analyses relevant to medical education research.

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