

Presentation

Mathematics and higher education

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The previous issue of *Educational Innovation* stimulated a dialogue on the relevance and future of academic journals; the journal contents provided keys to reflecting on the role of scientific publication in the Internet age. Different concerns about academic integrity are illustrative of a vast and complex problem that is already recognized, but not sufficiently analyzed from the inside of these kinds of publications. The pages of *Educational Innovation* were and are still a call to critically reflect upon the mechanisms and the future of academic journals; to this end, the tools were the very publication mechanisms analyzed. One of the results involves proposals that can be summed up in the following way. In each researcher, in each editor, in each jury committee we find tasks that are diversified—as a part of their purpose—and expressed in the reflection on the practices in academic publication that are not always socially beneficial or sensitive to current needs. The implications of reflection can be understood in this way: the perversion of thought and research should be avoided. Both are at stake if we do not seriously assume integrity and its primordial purpose of social and collective benefits towards a humanistic future.

Issue 72 and its thematic proposal are still a starting point for reflection, a pause, a search and an exercise of self-inquiry. The implication, for those who understand it, is to preserve critical thinking and a perspective of our duty. Stopping to question our own behavior, reflect on ourselves and our own academic practices is a proposal to revitalize and preserve the memory of the root of academic integrity. In this tenor of self-inquiry, the current issue of *Educational Innovation* offers a thematic section with two concerns: the development of mathematical thought and the relevance of higher education.

The first concern is expressed in the following question: what is the cost of wellbeing in Latin American societies if we do not address the development of mathematical thinking in children and youth? The question implies several issues. One of them is the concern for the long-term effects of the standardized vision of education that is focused on solving equations and neglects what is not quantifiable. Though there are diverse aspects within mathematics performance, they are not always considered, even

if they play a part in the development of thinking, such as reflection, metacognitive processes and social aspects, among others (Mevarech and Kramarski, 2017). The results of international evaluations have shown us, particularly since the beginning of the 21st century, how easy it can be to focus exclusively on results and immediately rank populations and countries. What do we ignore in this exercise that gradually standardizes and sometimes immobilizes and disperses our ideas of the social and humanistic purposes of education? These standardized references provide us with certain parameters to make decisions about educational policy design, but they also develop a perspective focused on results that gradually “convinces” us to concentrate on comparisons and figures, in other words, results without critical or reflective interpretation that contrast with the very process of learning and educating.

What do we ignore in an entire educational system when we focus on citing and interpreting standardized test results? What does an entire society forget when it ranks its own population through the lens of evaluation results, neglecting its diversity and wealth that cannot be measured through standardized means? I dare to say that the significant losses come from eliminating the essential role of curiosity, inherent to the learning process of a child or youth, from forgetting the role of excitement in the process of discovering and learning, or the importance and purpose of questioning and scientific inquiry that, together, form part of the learning process. What we lose sight of keeps us from addressing other imbalances, which only become apparent when they are beyond our control. For example, recent studies in the USA demonstrate the decline in young students’ interest in the sciences ((Itzek-Greulich and Vollmer, 2017). Comparing these studies with the situation in Mexico, we can see that in Mexico the interest of young people in sciences is growing, not declining. This is confirmed by the results of the 2015 PISA, focused on sciences (OCDE, 2016). Why don’t we consider the causes and implications of this interest of Mexican youth? Is it not perhaps something that demonstrates an interest in the processes of inquiry or improvements in the work carried out by teachers? Why this obsession with results that obscures the educational wealth and power of the process of inquiry?

When the focus on standardized results is contrasted with the learning process, two preoccupying results can come about: the first is considering something as new when it is in fact already part of the learning process. The second effect has greater implications: focusing the purpose of education on the obsessive and standardized measuring of results can be an important factor—though not always considered—that raises anxiety related to mathematics (Mevarech and Kramarski, 2017, p. 120) as well as stress in children, young people and teacher communities). How

much does stress affect cognitive and socio-emotional development in childhood and youth? How is this stress associated with the increase of violence?

The sole focus on measuring the development of learning with standardized tests and directing the educational effort to resolving these evaluations can be a decisive factor in the aversion for school, for learning mathematics or sciences, among other problems. But can this not also be part of the group of causes that increase academic drop-outs in young people or a lack of interest in school in children? We must also take into account the educational improvements brought about by a critical and context-based use of the educational test results on a large scale (Sandoval-Hernández, 2016). In light of the results and limitations of standardized tests, we need to consider aspects that are not measured that can be important catalysts of academic drop-outs. In other words, how do stress, aversion for school, lack of interest in education, academic drop-outs, among other factors, impact the growth of environments of violence and the lack of dignified employment?

The costs of violence, such as its impacts in wellbeing and the economy, have not always been measured clearly and specifically, but recent studies reveal the complexity of this web (Jaitman, 2017), and most importantly, how urgent it is to consider its impact on the Gross Domestic Product of a country. In this web where unemployment is linked with the increase of violence and crime, what is the cost for Latin America if higher education, because of the current dynamics of employment, the educational offer, the youth population and quality, does not update the relevance of its proposals and of its dynamic interaction with the needs of our societies? Let us think, as an example, of the Mexican case. At the end of this decade we will see the effects of mandatory secondary education; in other words, there will be more young people with secondary education and with aspirations for higher education. If the dynamic of employment continues to oscillate between diversification and specialization, adaptation and international mobility skills, and there is an ever growing value placed on creative skills, resilience, multicultural and multilingual skills, peace-oriented education, problem solving, cooperation and communication—will the proposals of higher education incorporate what young people will need for the middle of the next decade? Both topics, mathematics and higher education, will need to be reconsidered in a complex weave that is rarely addressed, with the need for a wider vision of space and time; therein lies the premise of this issue of *Educational Innovation*.

References

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