





## EDITORIAL

## Teaching basic biomedical sciences. Old debts and new challenges

### Enseñanza de las Ciencias Básicas Biomédicas. Viejas deudas y nuevos retos

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*“The belief that a genuine education comes about through experience does not mean that all experiences are genuinely or equally educative”.*

*“The educator, by the very nature of his work, is obliged to see his present work in terms of what it accomplishes, or fails to accomplish”.*

John Dewey

Experience & Education (1938)

Basic Biomedical Sciences (BBS) are present in the syllabus of many professional curricula, including medicine and other health professions.

The role of BBS in the curricula of these professions includes the formation of their scientific foundations from a morphological and physiological point of view, but they also provide

the basic knowledge to understand and learn other subsequent subjects like pharmacology, pathology and semiology. In addition, BBS contribute to the development of appropriate thinking models.<sup>(1)</sup>

There is a clear role for BBS in the development of logic thinking and the assessment of scientific



discipline and rigor.<sup>(2)</sup> Also important is the systematic organization of knowledge and the capacity for the recognition and application of deductive and inductive reasoning, analysis and synthesis, and the linkage of events by the laws of cause and effect.

Over the past few decades, BBS have experienced several tendencies which include an explosive growth of its knowledge body, not only in extension, but also in depth. There are also contradictory tendencies towards diversification and subspecialisation on one side and towards transdisciplinary approaches on the other.

Regrettably, when referring to BBS teaching, some vices and deviations are causes of concern. The most worrying one is that of encyclopaedism, which refers to the inclusion of excessive content in these subject programs, far beyond the real needs of each profession. There has also been criticism of too much compartmentalization and the lack of the relevant relationships of physiological and morphological sciences with other subjects. Last but not least, some sort of disorientation in the evaluation process have also been considered.

In connection with these vices and deviations, a set of pedagogical demands appeared in order to improve the teaching and learning of BBS, mainly that of correctly founded content selection and systematization, a clear orientation toward the specific profession and integration with other sciences, and the contribution to prepare the students for the self-learning that they will have to employ during their whole life.

It becomes clear that when considering BBS teaching we still have some old debts, but new

challenges are appearing. Let us consider some of them.

Considering the content of our study programs, we have the old debt of pertinence. In learning BBS, students are facing enormous amounts of information; and new content, with extension and depth are being continuously added. Most curricular changes are limited to disciplinary organization. A sound selection of the relevant contents for each profession is still a pending task in most educational institutions.

The appearance of competencies as a new pedagogical concept in the curricular scenarios impose new demands upon the subjects, including BBS, to concentrate attention on that knowledge and those abilities that contribute the most to the capacities that professionals have to mobilize in order to solve relevant problems in a given context.<sup>(3)</sup> Competencies are being adopted more and more in different geographical locations around the world. The content of BBS will have to be justified according to competencies.<sup>(4)</sup>

Another old debt is that of “active learning”, a conception that promotes the need to involve students more and more in their own formation.<sup>(5)</sup> But in many cases students are still performing passive – reproductive roles. Lectures continue to be used profusely as the main organization of teaching;<sup>(6)</sup> laboratory activities are not designed considering links between theory and professional practice. Computer assisted learning is mimicking these teaching practices, and, in spite of reputed advantages, problem based learning is not widely employed yet. And we have a new challenge, the need for a



continuous formation accepting that that knowledge acquired at the university is only the beginning of a long continuous formation that lasts for an entire lifetime. BBS have to be present all the way, including postgraduate education.<sup>(7)</sup> The way we assess BBS knowledge in our students has to be considered. Certainly, in many cases, memorization of details and learning by rote is still the main (sometimes unique) valid demonstration of learning. Written objective examinations continue to be the fundamental way of evaluation. In many cases only the less complex and lower level intellectual abilities are explored. Nature and hierarchy of learning objectives are not correctly considered in planning evaluation instruments and some professors even use evaluation as a pressure tool upon students arguing that a specific topic must be learned not because it is necessary for their future professional activity, but because there will be questions on this topic on their next exam. Nowadays, we must pay attention to the new challenge of considering evaluation as an integral component of the formation process. Students

must develop their capacities for self and peer evaluation.<sup>(8)</sup> Several instruments of evaluation (portfolios, field tasks, problems, etc.) must be used in addition to written tests. Learning activities have to be evaluated. Even the evaluation itself has to be evaluated.

Unfortunately, when we analyse how curricular design in BBS is developed we realize that there are changes that are introduced without scientific support or evidence of their virtues for the formation process. Even worse, sometimes evidence has accumulated indicating that something is not working properly, but no change is implemented to fix the problem. Starting from now, and for the future, we educators have to face the global challenge of evidence based BBS teaching.<sup>(7)</sup>

It is clear from this author's perspective that these debts and challenges most certainly are not expressed to the same extend in different countries and educational institutions, but reflections on them, looking critically inward, could help us to make a step forward in the infinite road of teaching improvement.

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#### Conflict of interests

The author has no conflicts of interests to declare.

