

Good practices, innovation or scientific research in education? A conceptual reflection

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Abstract: - In this work a conceptual delimitation of "good teaching practices", "educational innovation" and "educational research" is proposed, based on both the experimental design and the quality of the evidence provided by these studies. This terminological clarification should help teachers to recognize the scientific research specific to pedagogy, in order to distinguish them from studies that do not have enough elements to be considered fully scientific although, occasionally, they may work for some teachers. Thus, in a near future, an educational science should be established in which teachers can trust.

Key – Words: Good teaching practices – Educational research – Educational innovation – Evidence Based Teaching – Terminology

1 Introduction

Recently Perines (2018) meditated on the reasons that keep teachers away, in their professional practice, from educational research [1]. In addition to her interesting review of the subject, centered in part on the distance of teachers from the university "academy" and the disconnection of the political class (which legislates in educational matters) from the praxis and the educational reality [1, 2], it should be added to her approach that part of the problem is related to certain terminological confusion, topic on which we will reflect here. This is a problematic fact because it exposes all the teachers, who intend to access scientific research in their field, to trends and tendencies without a scientific basis, but which supposedly "work", although the quality of empirical evidence is low in many cases and convert these theoretical models into pseudoscientific ones [3,4]. While in physics or in medical practice, a clear, systematic and revisable state of art has been generated over the centuries, although always under construction and with constant updates coming from research (as it happens in all science [4]), this has not happened in pedagogy. In this way, teachers are lost when faced with a large number of studies, often focused on low quality evidence, which coexist with trends derived from some best-sellers (books with very few evidence-based content, or that mix studies reliable with materials of dubious quality). It is worth adding the "Infoxication" that has arrived in the 21st century due to the irruption of the Internet and the huge number of unreliable sources of information, despite some efforts to establish some order in the chaos [5].

Tejedor (2007), from his experience in medical studies, already pointed to the need to promote educational innovation based on scientific evidence (Evidence-Based Teaching), in the bungean line [6]. Tejedor systematically classified the quality of evidence according to objective data (number of study subjects [6], biases...), following well-established parameters of educational research [7]. The extrapolation of the medical context to the education reviewed by Tejedor is not trivial, but it establishes at least a point of departure that has its advantages and in which strong parallels are found with the pedagogical context [6]:

In both education and medicine there may be remedies that do not work for the entire population, but for a majority.

The quality of the evidence depends above all on the size of the samples for which the study has been carried out and on the good experimental designs.

Finally, there may be good teaching practices that are potential candidates to be part of the future scientific heritage of the discipline, although they are not yet empirically tested (falsifiable in a Popperian sense).

In this way, in the search for empirical evidence in education there are often confusions between what are "good teaching practices", what "educational innovation" implies and what is a contrasted scientific research, within the margins that every science linked to psychology possesses and, of course, considering the extreme complexity of research in education [8].

In this context, it has been tried here to make an initial terminological effort of delimitation (in an etymological sense, establishing limits) rather than definition. Thus, in table 1 this general distinction has been succinctly stated in the pedagogical context between the three hierarchical levels that are often confused in the literature: "Good teaching practices", "Educational innovation" and "Scientific research", relating them with the quality of the evidence according to [6]. The approach is delimiter rather than defining, as has been mentioned above, in a continuous qualitative reality that certainly does not fit only in three 'boxes', as happens with the colors that we categorize by names even though the wavelengths of light are continuous, so it is not always clear what name to assign to some tonalities that we find in the colorful visual world.

Typology of the study	Evidence Quality [6]	Main features
Good teaching practices	Low /Very low /Null	Often circumscribed to a single teacher and / or class group. Cases those are difficult to extrapolate. There are many descriptive studies that cannot be replicated.
Educational innovation	Regular	Controlled studies or with control group. The groups can be numerous and the protocols can be replicated and extrapolated to other classrooms.
Science Education	Good/Very good	Solid and contrasted studies in numerous occasions and contexts, with randomization. Systematic reviews or meta-analyzes with large samples.

Table 1. Distinction between the concepts of "good teaching practices", "educational innovation" and "scientific research", according to the quality of the evidence that they provide and some general characteristics (inspired but expanded from [6]).

However, despite this continuum of reality and the reductionism that this type of classification implies, the idea is to allow teachers to easily distinguish between scientific studies and those that are not, despite their efforts since they start from good ideas or approaches: only studies with good evidence should be considered worthy to be part of educational science, a science perhaps still under construction, as can happen to Linguistics and some of the formerly called "Social Sciences".

2 Problem formulation

Thus, "good teaching practices" are those methodologies that teachers apply in their classes and that, although they involve a qualitative or quantitative improvement of the results of their students, are difficult to replicate or extrapolate to other classrooms or pedagogical contexts. Good practices can follow general criteria established theoretically for a long time [9] and are the equivalent of the "it works for me" topic that in medicine can be the prelude to scientific studies of contrasted remedies, but also of pseudosciences [4]. Good teaching practices abound in descriptive studies of one or few teachers, sometimes incorporating technological elements or innovations that can be shared with the teaching staff, but in the absence of 'control groups' in which the educational intervention has not been applied, with bad or non-existent experimental designs or with samples that are too small [7, 10], so that the quality of evidence can be considered low (or very low or even null).

Teachers who perform good practices in their classes, especially in pre-university education, tend to settle for them because they are not usually interested in research professionally, nor do they have enough time to devote to it: the daily activities of the secondary and primary classrooms go beyond classroom hours and consume their time [11]. Then, on the one hand, the academy moves away from the reality of teachers [2], isolated in its ivory towers, and on the other hand the teachers find that they must take on more responsibilities

every day, they live overwhelmed by extinguishing daily fires, while reducing the potential time it could have to lead the educational research or, at least, cooperate in it.

On the other hand, it has been argued that innovative actions tend to search for new practices, through the use of varied methodologies and to favor interdisciplinary interaction among teachers [12, 13]. The interaction between teachers requires spaces and moments in which to share, design and develop common projects. Because educational innovation goes beyond good practices: it implies that there is a possibility of clear replication, with respect to good practices, so that in educational innovation protocols are planned, can be extrapolated and evaluated, good experimental designs are fundamental [7] and, in general, they will require the intervention of more than one teacher to avoid the 'teacher effect' as much as possible, that is, the expectations and the subjectivity in the application of the research protocols by the teacher influence the results [14]. Innovation is a very broad concept which is addressed by many definitions that vary depending on the specific area of application and the point of view adopted [15]. Educational innovation implies a change with respect to previous contexts, a change that can be local, perhaps in the classroom of a single teacher, but that must have been able to contrast at least with another (homogeneous) group of the same teacher, or in the same group with different teachers, controlling the variables and factors involved in the study and experimental design [7]. Some authors focus on the subjective perception of "novelty" [16], while others suggest that innovation is the application of a new resource or approach that is better or more effective than its predecessor, which implies a change in practice with added value [17].

3 Problem solution

Therefore, how to avoid subjectivity seems to be opposed to the educational practice itself, since the teacher in the educational practice inevitably intervenes, either through the pedagogical act or creating the conditions for the student to achieve meaningful learning of knowledge [18], in order to jump from educational innovation to educational research, something similar to what happens in clinical trials will happen [6]: solid and contrasted studies must be considered and replicated on numerous occasions, with randomization and with different teachers and in diverse educational contexts. Because despite the control and the possibility of replication of educational innovation, the protocols should therefore have been contrasted on numerous occasions, with large samples, analogous to how it is done with drugs in clinical trials, prior to commercialization, in order to increase the quality of the evidence from "regular" to "good" (or "very good"). The sample size seems then essential to achieve this empirical solidity, as for example the systematic reviews, randomized and with longitudinal studies of some protocols against bullying has contributed, such as the KiVa method [19], which have been shown solid and effective over the years [20].

Finally, there is also an ethical component, to consider regarding the groups of students to whom all educational innovation applies [21]: why leave a group of students without an intervention that, hypothetically, the teacher-researchers point out that it will have a positive effect? The answer is clear: its effectiveness is to be demonstrated, it is precisely being investigated for it. A feasible option is to alternate the control groups, for example, along a course, so that first a group receives the educational intervention object of study in a moment of the course and then it becomes the control group in another moment, and vice versa. Dosing interventions in groups of students is also desirable from the professional and experiential ethics of teachers [21].

4 Conclusion

An improvement in the quality of the empirical evidences of the studies in pedagogy would allow a leap of quality to education, what happens through a theoretical and conceptual improvement of educational science [22]. Finally, we can define:

Good teaching practices: are methodologies that teachers apply in their classes and which, although they involve a qualitative or quantitative improvement of the competences of their students, are difficult to replicate or extrapolate to other classrooms or pedagogical contexts.

Educational innovation: are methodologies that involve new changes that can be local (in a classroom with a single teacher), but that must have been able to contrast at least with more than one experimental group of the same teacher, or in the same group with different teachers, controlling the variables and factors involved in the study, and always following the correct research methods [7].

Educational research: implies that a solid study has been carried out and contrasted on numerous occasions, with randomization and with different teachers and, therefore, in different educational contexts and following the appropriate methods according to the experiment carried out [7].

"Good teaching practices" and "educational innovation" are very important, and useful for the work of many teachers, but they have a limited quality of the empirical evidence they provide. This fact makes teachers doubt the possibility of establishing an educational science and, by extension, of the academy and pedagogy as a whole [1, 2]. Educational science must be crucially built through sound pedagogical research that is not easy to implement [8]. Sometimes, these pedagogical investigations can be based on good practices or innovations of teachers that improve their experimental designs, increase their samples and randomize their studies, in the line of clinical research [6]. Perhaps this way, through an educational science, we can achieve that the educational community believes in the academy and its fruits, and we distance the phantom of the pseudoscience from the educational reality of the classroom.

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