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articoli

Tra un'istruzione evidence-based e un'istruzione basata sull'analisi delle pratiche di insegnamento. Una rassegna della ricerca didattica sul sistema scolastico superiore italiano

Between evidence-based education and analysis of teaching practices. A review of didactic research on the Italian high school system

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Abstract

Il contributo propone una rassegna dei principali filoni della ricerca didattica che, in questi anni, è stata condotta in Italia, nell'ambito del secondo ciclo, facendo riferimento anche al panorama della ricerca internazionale che ha trovato recezione nel dibattito italiano. Si tratta, da una parte, di ricerche evidence-based, dall'altra di ricerche basate sui cosiddetti filoni dell'analisi delle pratiche e delle routine di insegnamento. Se ne trae un bilancio che evidenzia le specificità dei vari filoni e sottolinea la possibilità di combinarli proficuamente tra loro.

Parole chiave: ricerca didattica; secondo ciclo di istruzione italiano; Evidence-Based Education; analisi delle pratiche di insegnamento.

Abstract

The document proposes a review of the didactic research on higher education which, in recent years, has been conducted in Italy, referring also to the international research landscape. This is an evidence-based education research, but also a research based on the so-called branches of the analysis of teaching practices and routines. It draws an overview highlighting the specificity of the various branches and emphasizing the possibility to combine them profitably.

Keywords: didactic research; Italian high school education; Evidence-Based Education; analysis of teaching practices.

1. Introduction

Studies on Italian teachers working in high schools (Semeraro, 2010; Passuello, 2014)[1] show that the prevalent teaching method has been for a long time the traditional one, centered on the subject of study, the textbook, the teacher and his/her explanation, leaving to the student the only task of answering the questions during the oral test. Although this teaching, which strictly follows the scheme "explanation-test" in full compliance with a program, is still widespread especially in upper secondary schools, the empirical research on the teachers' method shows some signs of change: there are teachers of high schools who do not define anymore their action in terms of "content transmission", but interpret it in a more complex way, as an indirect action, which aims to organize learning situations as a form of accompaniment and support processes during which students are protagonists and active builders of knowledge.

This idea is confirmed by various research analyzing the action of teaching as a whole, taking on two different focus of interest: if the so-called Process-Product research, which today is presented in the version of Evidence-Based Education (EBE), focuses on the effects that given strategies or interventions (process variables) have on students' learning (product variables), the research known as "analysis of teaching practices" and that one analyzing the routines take on a broader focus, which allows to consider teaching as a set of multiple and complex elements interacting together. The article is based on a review of the main educational research that, in recent years, have been carried out in Italian high school system and also refers to international research. The analyzed research can be grouped into three branches which will be described specifically. Then, it will be demonstrated that it is possible to build mutual combination among them.

2. The research on the effectiveness of specific teaching strategies on students' learning

EBE (Calvani, 2012; Vivanet, 2014) emphasizes the need for a knowledge that is reliable and expendable for practitioners and policy makers, especially regarding the effectiveness of specific teaching methods in order to help achieving relevant learning outcomes by students ("what works in what circumstances").

EBE mostly uses the methodology of meta-analysis to summarize the results of different experimental studies conducted on specific variables, and tries to identify the points of convergence among the results of the various research, to indicate which can be the most reliable teaching strategies.

The most significant work of recent years, which is fully placed within the EBE perspective, is certainly the one coordinated by John Hattie (2009; 2012)[2], which has synthesized more than 800 meta-analysis − summary of about 50.000 studies − involving a total of about 240 million students. The focus of Hattie's work is the identification of

[1] The Italian upper secondary education system is divided into two main sectors: state educational paths (high schools, technical schools, vocational schools, all five-years schools) and regional vocational education and training paths (three-years and four-years courses) (Tacconi, 2015).

[2] See also http://visible-learning.org/.

the most effective factors in promoting the academic success of students. Hattie has identified 138 factors, belonging to six different areas: students, family, school, curricula, teachers and teaching strategies. Each factor is associated with a value, what the author calls the Effect Size (ES), indicating precisely the effect or the degree of effectiveness of a specific element analyzed: the more a factor has a value greater than 0,40, which is the average of all ES of the factors considered by Hattie, the more it can be said that its influence is high. Hattie's elaborations do not refer to a specific school, although, reading his work, we can acknowledge that some strategies acquire various degrees of effectiveness depending on school levels[3].

Hattie's work suggests that the most influential factors on learning are those related to the action of teachers and the teaching strategies they use. Other factors, environmental or social ones, seem to affect learning less. With regard to strategies, Hattie emphasizes that those working best are those providing for direct participation by the teacher seen as a guide during educational process, such as the mastery learning (ES=0,57) and the direct instruction (ES=0,59), in addition to the meta-cognitive strategies (ES=0,69), the processes of self verbalization of lessons learned (ES=0,64), the reciprocal teaching (ES=0,74), the frequent use of a feedback, whether what the teacher gives or what he/she receives by his/her pupils (ES=0,73), and of formative assessment (ES=0,90). The less effective would seem to be those providing for minimal guidance by the teacher, as discovery learning, problem-based learning (ES=0,15), inquiry-based learning (ES=0,31), learning from experience (ES=0,32) and, in general, the so-called "constructivist" approaches, centered on student's independence.

The results of Hattie's work are actually very articulate and complex. The learning and teaching that really make the difference, and the study aiming to make more and more "visible", are what happens "when learning is the explicit goal, when it is appropriately challenging, when the teacher and the student both (in their various ways) seek to ascertain whether and to what degree the challenging goal is attained, when there is deliberate practice aimed at attaining mastery of the goal, when there is feedback given and sought, and when there are active, passionate, and engaging people (teacher, student, peers, and so on) participating in the act of learning. It is teachers seeing through the eyes of students, and students seeing teaching as the key to their ongoing learning. The remarkable feature of the evidence is that the biggest effects on student learning occur when teachers become learners of their own teaching, and when students become their own teachers" (Hattie, 2009, p. 22).

These data, however, gave rise to a lively debate, also because they would seem to dampen the constructivists' enthusiasm[4]. Actually they only question the naive forms of activism and demonstrate how more led approaches generally work better with the most vulnerable and the least equipped subjects, while those less-guided – but not guideless – work best with students who have developed greater autonomy and self-control (Pellerey, 2014). But perhaps it should be noted that it is the model adopted by this approach (the search for a direct relationship between teaching methods and learning outcomes) that

[3] For example, homework would be more effectively in higher levels of schooling (Hattie, 2009).

[4] Tobias and Duffy (2009) have documented second thoughts about teaching inspired by the constructivism, in the light of the acquisitions of cognitive psychology and in particular of cognitive load theory (Sweller, 1988).

gives greater emphasis to the direct action of teaching-learning cause-effect (Damiano, 2013) and therefore to more explicit models of education.

In recent decades EBE has provided a considerable and growing number of knowledge (in addition to Hattie's works already cited, see Hattie & Yates, 2014; Marzano, Pickering & Pollock, 2001; Seidel & Shavelson, 2007), which cannot be neglected.

The reference to the results of works like these cannot however be mechanical since teaching has nothing deterministic. Even Antonio Calvani (2013), who in Italy has become one of the strongest supporters of this perspective, calls for caution: "Data, models, best or good practices must be considered as the terms of a negotiation or a reinterpretation which can only reconfigure themselves in the new context in relation to existing practices. In short the aim of the research is to show the knowledge acquired within the contexts of study and to inform of these results, not to prescribe what to do" (p. 96).

The data provided by these investigations are often simplified and minimized. They should not be taken as prescriptions, but should be used as resources that can help to act more consciously, to explore new possibilities, since there are many possible ways, and above all, to agree with the choices that are made, while recognizing that teaching as object of knowledge is inexhaustible, because it has a systemic and dynamic nature.

3. The research focused on the analysis of teaching practices

One of the emerging branches of the educational research is the "analysis of the practices of teaching" (Damiano, 2006; Laneve, 2005). It's a plural inquiry[5], which takes as its specific object of investigation the actions of teaching, as actually they take place and not as they "should" take place, trying to promote an in-depth knowledge, using teachers as co-authors in the construction of a theory of teaching (research "with" teachers and not "on" teachers), aiming at putting into words the knowledge developed in and through experience, and referring mainly to qualitative methodological approaches. This line of the research indicates the overcoming of the primacy of theory over practice which for a long time has dominated the didactic research, and the birth of a new method considering practice as a source of knowledge, which cannot be reduced to the simple "putting into practice" of theoretical knowledge.

There are many works, finally also in Italy, aiming to theoretically establish this approach, or better, these approaches (Damiano, 2006; 2013; Day & Laneve, 2011; Laneve, 2005; 2010). In recent years several empirical studies inspired by the analysis of practices or by what Damiano (2006) calls the "Nuova Ricerca Didattica" (New Educational Research) have been carried out. These research explore, for example, the beliefs, the implicit conceptions or the subjective theories of teachers on students and their learning processes, on objectives and teaching methods, on professional acting

[5] The didactic research has been moving in this direction for decades in Europe and in America. For the French-speaking area, we can mention the contributions of Tochon (2000), on teachers' thinking, Altet (2003) and Lantheaume (2008), on the analysis of practices. For the English-speaking area, we can mention authors like Day (2004), Elbaz-Luwisch (2005) and Loughran (2010). In the German area, many jobs on good teaching are part of this guideline (Hugener, 2008; Jurik, Seidel & Gröschner, 2012; Weinert, 1996; Weinert & Helmke, 1996).

(Gola, 2012; Perla, 2010; 2011), on memories (Demetrio, 2003; Tacconi, 2007; 2013) and on training biographies of teachers, their professional writings (Laneve, 2009; Tacconi, 2011c) or other documentary writings and narratives (Tacconi, 2010), on reflective practices (Tacconi, 2011b), on *ethos*, the moral significance that the educational acting involves and the sense that teachers attribute to their actions (Damiano, 2007) and on teaching practices reported in detail (Mortari, 2010). The focus of attention is the practical knowledge of the teacher in all its aspects, or better, the practice of teaching as knowledge.

Various studies of this branch of research focus their attention on the "good" teachers and good teaching – "good" from the point of view of the teachers themselves – trying to identify the traits and the essential characteristics of their action (Bain, 2004; Mortari, 2010; Perla, 2011).

In high school systems such as the Italian and German one, in which there is a differentiation of education paths, educational research are compared also with the subject and the type of school. In recent years, one of the most explored contexts of the upper secondary education in Italy is that of Vocational Education and Training (VET). Research conducted in this field have tried to describe how teachers of various subjects think and plan their teaching action (Tacconi, 2009; Tacconi & Mejia Gomez, 2010). A survey has involved more than a hundred teachers of Italian and Mathematics, who work in vocational training centers (Tacconi, 2011a), focusing on how they manage the relationship with their pupils and organize the learning activities that they offer to them. What has emerged is a rich collection of teaching strategies which aim to build learning environments centered on a conscious making and a first attempt to formalize a different teaching model for VET. It is common for this type of research to produce a list of practices (see for example the "Repository ORA", which classifies a whole series of operations, forms of grouping and actions or didactic tools in Damiano, 2013), which are useful but that are not sufficient to generate theoretical models able to effectively orient the action.

Most of the research analyzing the practices are based on written or oral accounts of teachers, to which epistemic value is assigned (Laneve & Gemma, 2013). But the practices must be also observed. For this reason it becomes promising the research which has videos as investigative tools (Tacconi & Mejia Gomez, 2012). In this regard, there are many research, often based on video recordings, which are being conducted in some high schools of the German area and are consulted by some research groups in Italy. Tina Seidel, of the Technische Universität of Munich, highlights for example how in Mathematics teaching the strategies used most frequently by teachers are the lesson through dialogue or the task assigned to the students in a mainly individual work phase (Seidel, 2011). Even in Physics teaching it is often used the lesson through dialogue, but in this case the teachers also use the group work for the realization of experiments (Seidel & Prenzel, 2004). In language teaching what prevails is the lesson through dialogue together with delivery of individual and group work on texts (Klieme et al., 2008). The video observation and analysis of teaching practices generally succeed in highlighting the extraordinary richness of dimensions that even seemingly poor or ordinary teaching practices, like those just mentioned, can acquire in the reality of the situations.

The research listed above do not allow to get a specific relationship between given practices and the learning outcomes of the students or their overall attitude towards learning. But there are studies that analyze teaching practices in a perspective that tries to include also the points of view of the subjects who are learning. Bain's study (2004) on

college teachers in the United States, for example, tries to find out what "excellent" teachers do, analyzing their practices and using the learning outcomes of students and the results of interviews with students, as well as colleagues[6], as identifying criterion of research participants. Also the research by Parmigiani (2014), carried out in technical and vocational schools in Liguria following a mixed approach (quantitative and qualitative), associates the exploration of teachers' point of view with that of students' point of view, which is investigated both through structured instruments and group conversations. A research has even explored VET teachers practices on the basis of their former students' point of view (Tacconi & Mejia Gomez, 2013). These studies help us understand teaching as a complex action, combining various elements, which must be explored considering the points of view of the various parties involved.

The framework provided on this branch seems already rich, but in Italy the specific study on the teaching practices should be further developed in the various paths of high school education and in different disciplines. It should also be noted that the results of this research are not easy to give back. In some experiences (Tacconi, 2011a), returning the results to the participants was part of the process of research, as a moment of intersubjective validation of the results of the analysis. It is hard to say how much this research – that tries to make intelligible the experience of teaching as it is lived by the subjects themselves – can produce transferable results to other subjects. It should be deepened how the qualitative research on the practices' analysis – which doesn't intend to produce prescriptions or simple reports of good examples of practice – can be used to stimulate a reflection inspiring a continuous improvement of the action.

4. The research on routines and educational choreographies

This type of research is mostly linked to the research analyzed above and it is based on the awareness that the teaching action, in all its complexity, is not accessible to atomizing approaches. Most research of EBE explore the effect that single variables can have on learning. This approach turns out to be atomistic or excessively analytical and therefore not completely suitable to give back the complexity of the didactic action. Also Calvani (2014) acknowledges that centering on elementary actions risks to be of little significance leading to the irrelevance of the data collected. Hence, the focusing on "teaching strategies", meaning strategy as "a particular type of action plan, a project of relatively short duration, recognizable by its unique determination, identifiable in relation to a frame of general reference, maintaining its flexible decision-making structure but that also makes use of a defined set of specific procedural and reproducible routines" (ivi, pp. 9-10). Then EBE shows possible points of contact with the branch presented here aiming to identify those strategies that, based on experimental evidence, can be considered more effective than others.

A branch of research comes from this need, which does not take as inquiry units individual acts or individual teaching strategies but units, together articulated, such as routines, seen as "sets of operations that are repeated such as a theater script [...]. The

[6] Bain (2004) arranges the results of his survey on six questions: What do the best teachers know and understand? How do they prepare to teach? What do they expect of their students? What do they do when they teach? How do they treat students? How do they check their progress and evaluate their efforts?

routines are regularities with margins of variability allowing adaptations to the unexpected in order to keep them under control as schemes or habitus, which considerably simplify the different teaching situations" (Damiano, 2013, p. 166).

In Italy there are not many empirical research of this kind, not only on higher level education system. The analysis I could conduct shows that some research involve the supervisors of internship paths in teachers' initial education (Laneve & Pascolini, 2014; Maccario, 2014) and another one involves the routines of the scientific explanation of high school teachers (Vinci, 2012).

The tradition which focuses most on the study of routines, as expression of professional repertoire developed through experience, is the French one (Barrère, 2002). Also some German research may be included in this branch focusing on the action plans of teachers (Bromme, 1992; 2008; Pauli & Reusser, 2003; Seidel, 2003) or on the so-called *Inszenierungsmuster* (Hugener, 2008), which are models of representation of the educational action, making metaphorical reference to the artistic field (the performance, the play or the orchestration of a piece of music). We could say that the focus on the teaching sequences allows to bring out the "dramaturgy" of the didactic action itself or, to use another metaphor, it gives particular importance to the body as an element of analysis and interpretation of the teacher's work, as it were a choreography.

The Swiss pedagogue Fritz Oser has worked in this direction in its research projects (Oser & Patri, 1994; Oser & Sarasin, 1995) conducted in different educational fields. He has tried to identify some basic models (*Basismodelle*) seen as sequences or teaching phases allowing to facilitate a certain type of learning. These basic models consist in a series of operations which can encourage learning. A basic model is achieved in concrete forms – what Oser calls "observable structures" (Oser & Sarasin, 1995, p. 7) – and may be varied. Oser obtains its models through the observation of teaching practices and the analysis of these observable structures. He talks about "educational choreography" that is "the free organization of the space by a dancer, or in this case, by a teacher, the freedom of conception or temperament of a dancer or teacher together with the metric of the song that is given by the composer or, in this case, by the fixed sequence of learning activities (operations)" (ivi, p. 2). A lesson or a series of lessons can then be seen like a choreography: a series of dance steps in which the dancer can freely express himself by respecting the internal rhythm, the beat, the time and the structure of the song; his/her "art" lies in combining these elements: freedom of expression and constraint, which is often what allows the creative expression.

Oser identifies twelve "educational choreographies": experiential learning, learning by development or change of structure, learning by discovery or problem solving, knowledge building, formation of concepts, learning by meditation, strategic learning, routine acquisition and skills training, creative learning, cooperative learning, construction of values and identity, hyper-textual learning (Oser & Sarasin, 1995). Each choreography has its sequence of steps or stages. However, once again the problem is not only to observe and describe the routines, but going from the observation to a theory that allows to deeply explore them, trying to understand also why some educational choreography may be considered more particular or more suitable than others for the different high level paths.

5. Attempts at modelling

The research branches listed above, but also other more traditional theoretical approaches, try to propose modelling, that is to produce theories that are able to explain the constituent elements of teaching practice and the connections among them. If EBE proceeds starting from theories supported by experimental research, research on the analysis of practices or routines tries to bring out models in an ascending or inductive way. In each case, the theory is expressed in models, which have the function to connect, in an organic and coherent way, the various structural elements emerging from the analysis in order to generate an explanation of the phenomenon.

Antonio Calvani (2000), referring to Reigeluth (1999), proposes a classification of intervention strategies distributed on a continuum ranging from a maximum of centering on the activity of the teacher, to a maximum of centering on the activity of the learner: (i) lesson; (ii) modelling or training (guided practice); (iii) tutorial approach and drill and practice; (iv) discussion; (v) case study; (vi) cooperative learning; (vii) problem solving and guided discovery; (viii) simulation and role playing; (ix) project; (x) individual free expression and brainstorming (Calvani, 2000). Later, the same author and his collaborators (Bonaiuti, 2014; Calvani, 2012; Ranieri, 2005), this time developing a proposal by Clark (2000), have developed a model that includes the different teaching strategies, following an affinity criterion, within larger groupings called "educational architecture", which differ according to the level of directivity given to the teacher and the level of autonomy given to the students, but also according to the management method of the educational process and to the structuring levels of the teaching material. These are the architectures stated by Calvani (2012) and recalled by Bonaiuti: receptive/transmissive (which includes the strategies of classical exposition); behavioral or interactive (which includes the strategies of sequential interactive education, of modelling/training and support to positive behavior); simulative (including the strategy of the case study, of the simulation, of game-based learning, of role playing, and dramatization); collaborative (which includes the following strategies: reciprocal teaching, collaborative learning, and discussion), exploratory (problem-based learning, and project methodology), and meta-cognitive and self-regulatory.

It is very interesting for high school education also the proposal of Loretta Fabbri and Claudio Melacarne (2015), addressing to teachers of higher schools and considering theories that in recent decades have emerged in other field which are distant from the debate on the school, such as organizational studies and ethnographic research on informal learning in the working environment and in everyday life and on adult vocational education and training. What emerges is a model that approaches the learning processes taking place at school to those taking place in informal settings, enhances external space as expanded learning space, uses multiple reflective devices, considers students as novices or apprentices approaching to the expert knowledge by progressively participating to the practices of a social community. From an operative point of view, the proposal promotes the meaning of "communities of practice" (Wenger, 1998) and the methodologies of active learning (Watkins, Eileen & Lodge, 2007), socio-constructivism (Bereiter & Scardamalia, 1998), cooperative learning (Kagan, Kagan & Kagan, 2000; Sharan & Sharan, 1992), peer tutoring (Colvin, 2007) and reciprocal teaching.

Elio Damiano (2013), especially inspired by Jerome Bruner and Jean Piaget, but also by the results of the research on the analysis of teaching practices, formulates a general theory of teaching as mediation by focusing on the process through which the two subjects – the teacher and the student – interact with the cultural objects. The teacher

becomes the director who produces a context in order to create that encounter between the student and the cultural objects called learning. The mediation is carried out through the teacher's use of a complex system of teaching devices: the active mediators (activities that are performed through direct experience); the iconic mediators (representations, maps, diagrams, graphs, etc.); the analogic mediators (simulation, game, drama, etc.), and the symbolic mediators (words, concepts, numbers, etc.). These devices are able to mediate between the action of teaching, an indirect action carried out by the teacher, and the action of learning, seen as the independent and active process of the learner by exploring and cognitively reorganizing the territories of knowledge.

Other modelling strategies come from a systematization of what emerges by reflecting on the practical experience. In this regard, it is very interesting Robyn R. Jackson's work (2009) which is based on his own experience but also on literature and formulates seven principles for an excellent teaching: (i) start where your students are; (ii) know where your students are going; (iii) expect to get your students there; (iv) support your students; (v) use effective feedback; (vi) focus on quality, not quantity; (vii) never work harder than your students. The last principle, which gives the title to Jackson's book, strongly stresses the fact that learning is always an action of the learning subject and therefore, if the teacher is more active and works harder than the student, it is less likely there is learning.

6. Conclusion

In conclusion, it must be said that in Italy the empirical research in the didactic field, notably with regard to the secondary education, does not have a tradition even remotely comparable to that of other countries, such as those of Anglo-Saxon countries, but also those of France and Germany.

In Italy, various theoretical studies have been carried out (Baldacci, 2004; Guasti, 1998), there are many documents about significant educational experiences, especially online but also on magazines mainly addressed to teachers[7], there are – but they are not even many – educational and operating manuals for teachers (Bonaiuti, 2014; Robasto & Trinchero, 2015; Tessaro, 2002) but there are not many empirical research which beyond the approach chosen, qualitative or quantitative, allow to access the results based on the adoption of a rigorous methodological approach.

In Italy the theoretical modelling is more frequent than modelling based on empirical evidence. In recent years there are more and more models created by international evidence-based research. The research on the analysis of practices or routines is not always able to overcome the descriptive level and to reach a real formalization or the construction of useful models to better understand and to improve the act of teaching.

Both the research of EBE branch and the research based on the analysis of practices and routines try to outline the features of the good teaching and the good teachers, but they do it by following different criteria and reaching different results. If the evidence-based research defines good teaching starting from the effects that this one has on learners

[7] In particular *Nuova Secondaria* (http://nuovasecondaria.lascuola.it/) for high schools and *Rassegna Cnos* (http://www.cnos-fap.it/page/rassegna-cnos) for the VET context.

(output), the research based on the analysis of practices tends to define good teaching starting from the representation the actors have and from their knowledge in action.

But these are not incompatible branches, provided that both lines of research are unanimous in stating the centrality of teaching. This centrality emerges as an outcome in the evidence-based research, that comes to assert the strategies that favor the direct intervention of the teacher as more effective than the less directive ones, and is taken as a starting assumption in the research based on the analysis of practices, that puts its focus on the action of the teacher and often aims to give voice to the inventions that the best teachers develop in class.

We will therefore need teaching models able to take into account both the results that emerge from the comparison of many pieces of experimental research as well as those that emerge from more analytical qualitative approaches and from the knowledge that is generated in the practice. Finally we need a concept of "evidence-based" broaden beyond the limit of experimental research. In effect the results of the research based on the analysis of practices and routines allow to access wide and deep regions of meaning, which the only experimental research, with its more atomistic approach, is not able to satisfactorily investigate.

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