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Short bio:

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Proposal

Title: University teaching in the large classroom. Engaging different disciplines between didactic transposition educational reconstruction processes

Abstract:
In connection with recent researches on the educational development of faculty members, this paper presents the training programme to improve faculty members teaching skills at the University of Milano-Bicocca, called “Teaching large classroom”. This research examines aspects of the teaching approach implemented in this programme, with a particular focus on the relationship between different disciplinary frameworks in the teacher training of university teachers. The hypothesis of this paper is about the inter and transdisciplinary approach of the training programme and its validity on developing university professors teaching skills and, more specifically, their capacity to transfer and reconstruct their learning about teaching-learning methods. The first results show teachers frequently engaged in distancing and meta-cognitive reflection with respect to specific aspects of the processes of didactic transposition and didactic reconstruction: the selection of the knowledge to be taught; the recipient of the knowledge; the use of examples to make the knowledge accessible; reflection on the epistemological basis of the knowledge taught.

Keywords: Teaching large classroom; educational development; didactic transposition; educational reconstruction; interdisciplinary approach.

1. Introduction

In this paper, we present a professional development project entitled “Teaching in the large classroom” that has been devised for the academic staff of the University of Milan-Bicocca. We examine aspects of the teaching approach implemented in this programme, with a particular focus on the relationship between different disciplinary frameworks in the teacher training of university teachers. We set out to problematise, rather than provide straightforward answers to, the following two questions: What role can teacher trainers, with their specific knowledge and expertise, play in the design of university teaching programmes? How is it possible to combine and/or integrate reflection on teaching-learning methods with the subject-specific epistemological aspects of teaching in the training of university professors?

More broadly, the professional development project “Teaching in the large classroom” is part of a line of inquiry in the field of *higher education* (Tight, 2008) that has particularly flourished in recent years (Langevin, Grandtner & Ménard, 2008; Frenay et al., 2010; Kehm & Musselin, 2013), including in the Italian context (Coggi, Ricchiardi, 2018; Felisatti & Serbati, 2014; Galliani 2011, Michelini, 2002). The project follows the guidelines provided in the Eurydice report *High Level Group on the Modernization of Higher Education* (2017) and is also informed by the French-language literature on methods of university teacher training (Frenay & Bedard, 2004; Langevin, 2007), which has especially focused on the professional development.

2. A professional development programme for the teaching staff of Milano-Bicocca University

Before addressing our main theme, let us first briefly outline the three levels in the professional development programme offered to the academic staff of the University of Milano - Bicocca.

1. First-level workshop "Teaching Large Classes", full immersion, 12 hours.

2. Second-level workshop "Student Learning and Assessment", only available to lecturing staff who have already attended the first-level workshop, full immersion, 8 hours.

3. Individual consultations on demand with lecturers who have already attended the first-level workshop.

2.1 The pillars upholding the professional development intervention

The training programme just outlined is part of a strand of research initiated by the first author and her research group in the field of teacher education (Nigris, 2004; Nigris, Balconi, Zuccoli, 2015). The work of the research group draws on traditions of scholarship in the areas of: adult professional development (Bateson, 1978), teacher education for primary and secondary school teachers (Nigris, 2004); and the professional development of university teachers (Fraser et al., 2010). The combined influence of these different research traditions led to the identification of four main pillars on which to base the current professional development model (Nigris, 2018):

a) The first pillar concerns the teaching-learning process and involves inviting the participants to reflect on the professional development programme itself, at two different levels: 1) the learning contents and teaching methods adopted; 2) the choices and actions effected by the teacher-trainer in designing and conducting the intervention.

b) The second pillar concerns teaching methods with the aim of encouraging the participants to engage in complementary modes of reflexivity, following the categories proposed by Van

Manen (1995) and subsequently revisited by Conway (2001): reflection-on-action, which is focused on past action and a crucial step in the analysis of educational experience; reflection-in-action, which comes into play during immersive activities that simulate teaching practice, allowing the participants to develop mechanisms for reflecting on the action being carried out, "as though they themselves were the protagonists of the experience"; and reflection-for-action, elicited by engaging the students in small-scale educational design activities.

c) The third pillar, concerning communication in the large class setting, focuses on specific aspects of the interaction between teacher and students, such as the role of questions (Nigris, 2009; Selleri, 2016) and thinking routines (Tishman, 2002) in stimulating students' reasoning which are viewed as key components of the educational work mediated by the teacher (Damiano, 2009; Bonaiuti, Calvani, Ranieri, 2007).

d) The fourth pillar, which is the primary focus of the current paper, concerns didactic transposition and reconstruction of subject-specific knowledge processes (Duit et al., 2012; Van Dijk, Kattmann, 2007). This pillar relies on: a) delivery of the professional development intervention by teachers, whose expertise is in education/teaching-learning methods and who are themselves experienced in large classroom teaching; b) getting the participants to focus on the first phase of the didactic transposition process (Chevallard, 1985; Nigris, 2016): the selection of subject-specific contents and epistemological vigilance (Astolfi, 2008).

3. The research hypothesis: multi-disciplinarity, inter-disciplinarity and trans-disciplinarity as conditions for the teacher training of university teachers

The hypothesis that we set out to explore here was that an inter and transdisciplinary training approach, based on the dialogue between different disciplines and epistemologies, would be a valid means of developing university teachers' teaching skills and, more specifically, their capacity to transfer and reconstruct their learning about teaching-learning methods. Following Nicolescu (2014), Rossi (2011) and Morval (1993), we define a multi-disciplinary approach as involving the juxtaposition of scholarship from different disciplines that have all investigated a given topic, but without examining how these different paradigms may be mutually related; an inter-disciplinary approach as involving inquiry in which a topic is explored from different disciplinary perspectives and in relation to different dimensions of knowledge (ontological, epistemological, methodological); and finally a trans-disciplinary approach as involving inquiry in which experts from different disciplines go outside disciplinary boundaries to fuse ontologies, epistemologies and methodologies, giving rise to new knowledge and, sometimes, to new disciplinary fields.

The Milan-Bicocca University professional development programme, by virtue of its structure and characteristics, matches all three of these definitions.

1. Multi-disciplinary aspects: a) the academic board, composed of university professors from different disciplinary areas, which coordinates the training programme at the institutional level. These professors are privileged interlocutors in the process of analysing professional development needs across the university's different departments; b) the groups of teachers participating in the professional development interventions (the main criterion for defining the groups is the disciplinary background of the participating teachers).

2. Inter-disciplinary aspects: the activities making up the training intervention, which require participants to dialogue with colleagues from disciplinary backgrounds different from their own in order to complete the tasks assigned to them by the trainer.

3. Trans-disciplinary aspects: the aim of the intervention is to enhance participants' teaching skills: this necessarily brings them into contact with a disciplinary field – which is the field of the didactics – that they have not previously engaged with.

3.1 From inter-disciplinarity to trans-disciplinarity: didactic transposition and the role of the teacher trainer

To examine in depth the specific inter- and trans-disciplinary features of the Milan-Bicocca professional development programme, and to problematize the research hypothesis presented above, it is useful to outline the activities in the first-level workshop "Teaching in the Large Classroom". These activities are focused on selected variables in the didactic transposition process (Martinand, 1986; Develay, 1995) – namely the selection of subject-specific learning contents (Chevallard, 1985), epistemological vigilance (Astolfi, 2008), and conceptual change as it applies in the different disciplines (Vosniadou, 2009) –, with a view to fostering critical reflection on different aspects of designing university courses. Indeed, exchanging views with colleagues from other disciplines and mediation provided by the trainers encourages participants to reconceptualize their own teaching practices, which are usually constrained by pre-given and consistently reproduced disciplinary boundaries: their new perspective encourages participants to look outside the boundaries of their individual disciplines and to analyse their practices in light of educational knowledge, no longer focusing solely on content, but on the transformation that this content undergoes to be taught to student who are not expert in their disciplinary area. To foster this change of perspective, the "Teaching in the Large Classroom" programme is structured to elicit, via the activities listed below, engagement with new ideas at two different levels: first, at an inter-disciplinary level, through dialogue among the participating teachers; second, at a trans-disciplinary level thanks to the mediation of the trainers.

The following are the three training activities most specifically designed to elicit these outcomes:

- analysis (individually and in pairs) of video footage showing teaching-learning activities being conducted in different disciplinary fields;
- simulation in pairs of a teaching-learning activity: each member of the pair in turn explains to the other a topic from his or her own subject area that is considered difficult to teach;

- group analysis of questions asked to students which require the definition of terms that hold different meanings in different disciplinary fields.

Hence, these activities are designed to help the participating teachers progress through two consecutive steps: first, they are stimulated to shift from a mono-disciplinary perspective to an inter-disciplinary one; second, they are driven toward a trans-disciplinary perspective. Starting from the analysis of their choice about disciplinarian contents to be taught, university teachers learn how to better comprehend students' difficulty to conceptualize and to make these contents more accessible to non-experts.

4. Data collection method

Three types of research instrument were used to collect data with a view to exploring the validity of the research hypothesis: 1) a questionnaire administered before the workshop that focused on participants' professional development needs; a questionnaire administered at the end of the workshop that focused on the perceived impact of the training; 2) in-depth interviews (conducted following analysis of the post-intervention questionnaires) with a subsample of the teachers who had participated in the workshop; 3) analysis of the documentation of the training process itself (audio recordings of the group discussions) to collect data concerning interdisciplinary exchange. Thematic content analysis was applied to the textual data, following a constructivist grounded approach (Charmaz, 2014).

The data collected concerned three editions of the workshop "Teaching in the Large Classroom" conducted between January and July 2018, which was attended by 121 lecturers from 11 departments (add total number of teachers who attended in 2017-2018).

5. Preliminary outcomes

5.1 Multi-disciplinarity and inter-disciplinarity: effectiveness ratings

The results of the data analysis bore out one aspect of our research hypothesis, namely that concerning the formative potential of an inter-disciplinary approach. Specifically, the questionnaire data suggested that the interdisciplinary composition of the training group was deemed to be effective by the trainees: over 90% of the participants (out of a total of 121) reported that they positively welcomed this aspect of the workshop's organization, while over 75% stated that they would like to continue receiving training in inter-disciplinary group settings. Furthermore, as the following citation shows, the analysis of the documentation (discussion audio recording) has clearly underlined how the trans-disciplinary confrontation can help the participants to change their perspectives on their own discipline, on learning and teaching processes and also on teachers' representations about students' attitude.

Working with people from other disciplines is very interesting in my opinion, it gives you a lot of ideas. And not only because you did not have that competence, but also because it makes you see another way of looking at things (...). Yes, she managed to put the right container around the contents.

5.2 Consciously implementing a didactic transposition process

Mediation by the trainer during the inter-disciplinary activities stimulated the participants to reflect on some of the factors that are implicated in the didactic transposition process and that can impact on the effectiveness of their course design: a) selecting the knowledge to be taught; b) taking into account the recipient of the knowledge; c) using examples to make the knowledge more accessible.

The teachers' answers to the post-questionnaires suggest that they had come to view the selection of learning contents as a key step in the didactic transposition process. Specifically, 73% of the surveyed participants no longer viewed selecting contents from a "cumulative" perspective focused on ensuring that the knowledge delivered was exhaustive, but were now more inclined to select them based on learning objectives. This shift in perspective is reflected in the comment of a first-level workshop participant on the paired simulation activity:

This exchange among colleagues from different disciplines helped me to focus on conceptual steps I had taken for granted; it helped me to understand what the priority is in our disciplines. (...) For example, clarifying the precise problem you want to solve.

Concerning the recipient of the knowledge, the teachers appeared to link their choice of subject-specific learning contents with the type of recipient these contents will be taught to: degree course, year of degree course, prior knowledge and beliefs, etc. The participants, thanks to the exercise of explaining a difficult concept from their discipline to a colleague, began to question the extent to which they design their courses with the recipient of the educational intervention, i.e. the student, in mind. The student is not the bearer of "scholarly knowledge" about the discipline, but on the contrary needs to be introduced more deeply into it, starting from his or her prior knowledge or naïve understanding, via an act of transposition performed by the teacher.

Given that the problem appeared to be the students' prior competence, my colleague helped me to think about how this competence is managed during the course. For example, by thinking of some background questions a few days before dealing with the concept ... and starting from there.

The teacher in this citation relates inter-disciplinary exchange with an increased awareness of the role of students' pre-knowledge in the learning process and the need to bring this knowledge to light. The same concept is also reflected in the following comment made during one of the professional development activities.

I have been teaching physics for a long time and I must say that I now have a good grasp of what it means to teach physics to opticians and physics to physicists. It's very different, especially with respect to what students know before starting the course and how they reason about the experiments I often do.

With regard to the use of examples to make knowledge accessible, let us observe the following comment on the paired simulation activity.

The topic we were dealing with had to do with statistics, and specifically how the concept of estimation can be formalized, evaluated, and controlled. I was telling my colleague that the main difficulty for my students is to follow me. However, this does not happen when I use an intuitive example. What got me thinking the most was that I said things that I try to explain in the classroom. I asked myself: "But if this is the key concept I am trying explain in the classroom, then it is not obvious to the students".

In this citation, the teacher, while describing her attempt to teach a colleague a concept from her discipline that students find difficult to learn, noticed an analogy between the teaching situation just experienced and that which she habitually experienced in the classroom with her students. A key feature of this situation, according to the teacher, is the efficacy of using examples to facilitate the students' construction of abstract concepts, starting from the recognition of familiar and immediately recognizable elements.

6. Conclusions

The preliminary research outcomes confirm the educational value of conducting the "Teaching in the Large Classroom" programme with multi-disciplinary groups of teachers. This approach was validated both by the degree of satisfaction reported by the professors with this characteristic of the training group (92% expressed strong approval in the post-questionnaire). Furthermore, the data collected from the training activities showed that the participants frequently engaged in distancing and meta-cognitive reflection with respect to specific aspects of the processes of didactic transposition and didactic reconstruction: the selection of the knowledge to be taught; the recipient of the knowledge; the use of examples to make the knowledge accessible. The professors' newly acquired view of their teaching practice may also be viewed in terms of a transition from a mono-disciplinary perspective to an interdisciplinary one, given that after the workshop they displayed a better grasp of how different disciplines can relate differently to the same didactic phenomena; subsequently, a further transition from an inter-disciplinary perspective to a trans-disciplinary one could be observed, in that the participants began to use concepts from a new - from their point of view - area of knowledge, that of didactics, and this was not based on the memorization of contents, but on the active construction of learning contents based on exchanges with colleagues and the mediation of the teacher trainer.

The research findings show the decisive role played by the trainer in facilitating this double transition and, more specifically, in guiding the participants not only to construct the key concepts and stages in the theory of didactic transposition, but also to use them to critique their own teaching practice, previously mainly intuitively understood. Almost all the participating teachers (98%) rated the course to be professionally conducted, as well as positively rating the trainers' ability to elicit comparison of the different disciplines (93%) and clarity of presentation (91%).

Finally, it should be emphasized that the mediating role played by the teacher trainers requires specific professional competence, which is not only theoretical, but is more related to the ability to provide support for reflexivity and metacognition over the learning process, which, in this case, is derived from long experience of teacher training and teacher professional development. This professional competence is a necessary but not sufficient condition – as is the multi-disciplinary composition of the group and the inter-disciplinary dimension of the training activities – for attaining the target training objective of enhancing the participating teachers' didactic transposition skills.

In conclusion, it has to be underlined that the inter- and trans-disciplinary approach of the training programme favoured at least two relevant benefits within University of Milano-Bicocca's culture: firstly - at institutional level - the joined design, between the training group and professors of other departments, of specific training programme for teaching assistant and the so called "tutor of laboratory"(previously designed and conducted only by professors of the same disciplinary area of the trainees); secondly, the university senate's decision of making the "Teaching in the Large Classroom" programme compulsory for new tenured researchers, maintaining the multi-disciplinary composition of the group also with the aim of promoting reciprocal knowledge.

7. References

ASTOLFI, J. P. (2008) *La saveur des savoirs: disciplines et plaisir d'apprendre*. Issy- les-Moulineaux, ESF.

BONAIUTI, G., CALVANI, A. and RANIERI, M. (2007) *Teoria e prassi dei dispositivi formativi*. Roma: Carocci.

CHARMAZ, K. (2014) *Constructing grounded theory*. London, Sage Publications.

CHEVALLARD, Y. (1985) *La transposition didactique. Du savoir enseignant au savoir enseigné*. Grenoble: La Pensée Sauvage.

COGGI, C. and RICCHIARDI, P. (2018) Developing effective teaching in Higher Education. *Form@re - Open Journal per la formazione in rete*, 18 (1), pp. 23-38.

CONWAY, P.F. (2001) Anticipatory reflection while learning to teach: From a temporally truncated to a temporally distributed model of reflection in teacher education. *Teaching and teacher education*, 17 (1), pp. 89–106.

DEVELAY, M. (ed.) *Savoirs scolaires et didactiques des disciplines. Une Encyclopédie pour au- jurd'hui*. Paris, ESF.

DUIT, R., GROPENGIEßER, H., KATTMANN, U., KOMOREK, M., and PARCHMANN, I. (2012). The model of educational reconstruction–A framework for improving teaching and learning science. In: JORDE D. and DILLON, J. (eds.) *Science education research and practice in Europe*. Rotterdam: Sense Publishers, pp. 13-37.

EUROPEAN COMMISSION/EACEA/EURYDICE (2017) *Modernisation of Higher Education in Europe: Academic Staff - 2017*. Eurydice Report. Luxembourg: Publications Office of the European Union.

FELISATTI, E. and SERBATI, A. (2014) Professionalità docente e innovazione didattica. Una proposta dell'Università di Padova per lo sviluppo professionale dei docenti universitari. *Formazione e Insegnamento*, 12 (1), pp. 137–153.

FRASER, K., GOSLING, D., & SORCINELLI, M.D. (2010). Conceptualizing evolving models of educational development. *New Directions for Teaching and Learning*, 122, pp. 49–58.

FRENAY, M., and BEDARD, D. (2004) Des dispositifs de formation universitaire s'inscrivant de la perspective d'un apprentissage et d'un enseignement contextualisés pour favoriser la construction de connaissances et leur transfert. In: PRESSEAU, A. and FRENAY, M. (eds.) *Le transfert des apprentissages: comprendre pour mieux intervenir*. Québec: Presses de l'Université Lava

FRENAY, M., SAROYAN, A., TAYLOR, K. L., BÉDARD, D., CLEMENT, M., COLET, N. R. and KOLMOS, A. (2010) Accompagner le développement pédagogique des enseignants universitaires à l'aide d'un cadre conceptuel original. *Revue française de pédagogie*, 3, pp. 63–76, pp. 239-267.

GALLIANI, L. (2011) *Il docente universitario. Una professione tra ricerca, didattica e governance degli Atenei*. Lecce: Pensa Multimedia

KEHM, B.M., and MUSSELIN, C. (eds.) (2013) *The development of higher education research in Europe: 25 years of CHER*. Rotterdam: Sense Publishers.

LANGEVIN, L. (ed.) (2007*) Formation et soutien à l'enseignement universitaire: Des constats et des exemples pour inspirer l'action*. Québec: PUQ.

LANGEVIN, L., GRANDTNER, A. M. and MÈNARD, L. (2008) La formation à l'enseignement des professeurs d'université: un apercu. *Revue des sciences de l'éducation*, 34 (3), pp. 643-664.

MARTINAND, J-L. (1986) *Connaître e transformer la matière.* Peter Lang, Berne

MORVAL M. (1993) La recherche interdisciplinaire: une difficile integration. In: DE GAULEJAC, V. and ROY, S. (eds.) *Sociologies cliniques. Montréal*: Editions Hommes et perspectives, pp. 297-304.

NICOLESCU, B. (2014) Methodology of transdisciplinarity. *World Futures*, 70 (3-4), pp. 186-199.

NIGRIS, E. (2018) Learning to teach: the pilot programme to improve faculty members teaching skills at the University of Milano-Bicocca. *Form@re-Open Journal per la formazione in rete*, 18 (1), pp. 53-66.

NIGRIS, E. (2009) *Le domande che aiutano a capire*, Milano, Mondadori.

NIGRIS. E. (ed.) (2004) *La formazione degli insegnanti*, Roma, Carocci.

NIGRIS, E., TERUGGI L.A. and ZUCCOLI F. (2016) *Didattica generale*. Milano: Pearson.

PONTECORVO, C. (1993) Forms of discourse and shared thinking. *Cognition and Instruction*, 11 (3-4), pp. 189–196

ROSSI, P. G. (2011) *Didattica Enattiva*. Milano, Franco Angeli.

SELLERI, P. (2016) *La comunicazione in classe*. Roma: Carocci.

STANLEY, C. and PORTER, E. (eds.) (2002) *Engaging large classes: strategies and techniques for college faculty*. Bolton, MA: Anker Publishing Company.

TIGHT, M. (2008) Higher education research as tribe, territory and/or community: A co-citation analysis. *Higher Education*, 55 (5), pp. 593–605.

VAN DIJK, E. M., and KATTMANN, U. (2007). A research model for the study of science teachers' PCK and improving teacher education. *Teaching and Teacher Education*, 23 (6), pp. 885-897.

VAN MANEN, M. (1995) On the epistemology of reflective practice. *Teachers and Teaching*, 1 (1), pp. 33–50.

VOSNIADOU, S. (2009) *International handbook of research on conceptual change*. New York, NY: Routledge.