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An Inquiry Based Continuing Professional Development Programme: how to make the first Steps?*

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1. Conditions for collective settings efficiency

Research findings concur in demonstrating both that collective settings spur teacher development, and that changes in teacher approaches and practices depend on some conditions (Grangeat, 2012).

Meirink, Meijer and Verloop (2007) show that collaboration frequently affects teachers' approaches but seldom teacher's practices; furthermore, any effects on practice often confirm the teacher's own previous methods. Overcoming these results, Andrews and Lewis (2002) found impacts on action in the classroom when the school organization allows teachers to share understandings through professional learning activities. In such a case, teachers changed their approaches and practices in order to meet students' learning needs. Such a disparity is coherent with the conclusions of Hargreaves and Fullan (2012) who notice that 'schools [as well as teachers] improve when they collaborate with and learn from other schools [and teachers] –but not always.' (p. 136).

Specification of these conclusions are proposed by van der Valk and de Jong (2009) who showed that scaffolding experienced science teachers in IBST development is fruitful when these teachers are embedded within cooperative settings where they can reflect about specific professional questions with other colleagues, researchers and teacher educators from university. Similar issues have been found by other researchers. For instance Jaworski (2006) reports a project designed to create inquiry communities between teachers and educationists in order to promote and develop IBST methods within the classroom. The key feature of this inquiry community is that participants acknowledge and address issues and tensions within their approaches and practices. This critical alignment is both a goal and an outcome of the collective work. The study reports the way this community supports teachers towards their goals, such as fostering students' self-esteem, despite their old habits and the social context which could impede these changes.

Consequently, this leads to design collaborative settings that spur teacher development as:

- networking actors from a same educational sector who share common interest and motivation in resolving a specific educational problem,
- stimulating cooperation amongst different kinds schools (primary and lower secondary) and of professionals (teachers, head of schools, inspectors, researchers and teacher educators),
- underpinning the long process of teacher learning and teaching transformation by extending the CPD program length of time.

These three conditions specify a new way for teacher training. This kind of collaborative settings is frequently called 'Inquiry Based Continuing Professional Development program' since all the actors involved in this IB-CPD program endeavour to resolve the common problem but any of them know the solution of this problem.

This paper addresses a specific IB-CPD program that involves teachers from two lower secondary and four primary schools within a urban sector in France. A first question is to describe and understand the basis and the structure that underpin this programme. A second question is to figure out a set of variables that will be monitored in order to regulate and evaluate the program efficiency.

2. Evaluating the efficiency of a specific IB-CPD program

The sample consists of fifteen teachers involved in the EvaCoDICE project that aims to develop formative assessment practices within science inquiry-based teaching method. This EvaCoDICE project is included in a network of collaborative settings in France —ruled by the French Institute of Education— and is part of a European project —ASSIST-ME— about assessment within science education. The EvaCoDICE project is planned to last three years from 2012 to 2015. Thus this paper addresses the first steps of the study.

A first kind of data results from an analysis of the material that was shared by the actors through a specific website and three seminars per year. This will lead to describe the basis and structure of the studied collaborative setting.

A second kind of data is drawn from focus groups that had been held with the teachers involved in the project. This will elicit the evolution of teachers' approaches.

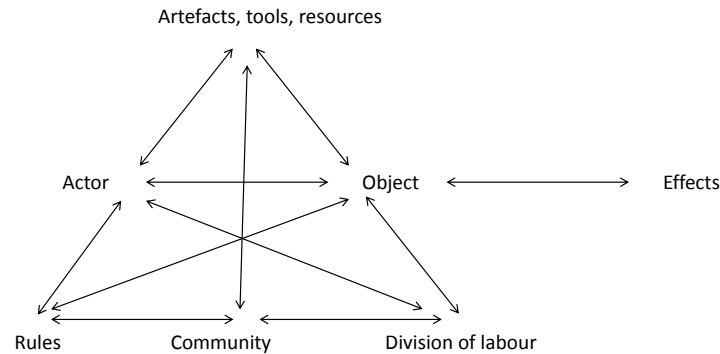
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Finally, the third kind of data will result from a content analysis of teaching material, classroom observations, and interviews with teachers. This will occur after the 2d year of the project.

As the project is just beginning, the paper focuses on outcomes that are able to reinforce the project itself. Thus, it highlights the factors that appear as helpful for the teachers.

3. Results

The study is based on the activity theory framework after Engeström (2001) modelling as below.



3.1. IB-CPD program description

Firstly, we will describe the different elements of the system in which the teachers were embedded.

3.1.1. Actors

The EvaCoDICE project had concerned three types of professional team:

- Practitioner team comprised 11 science teachers from 2 lower secondary schools and 4 primary teachers from 4 schools; all these schools were part of one educational sector nested within an urban sector where the population is socially disadvantaged.
- Research team comprised 5 teacher educators and 6 researchers from the university in charge of teacher education; this research team was complemented by a PhD student.
- Institutional team comprised 2 principals of lower secondary schools, 2 persons (inspector and counsellor) who rule the primary schools, and 3 persons from the regional authorities for secondary schools (inspectors and counsellor).

3.1.2. Tools, signs and resources

The EvaCoDICE project was based on three types of resources:

- A dedicated website had allowed actors to share the project documents (courses preparations, assessment tools, meeting minutes, scientific articles, etc.). In the beginning of the first year, the documents implemented by teachers on the website were very general and quite useless: these were lesson plans and formal assessment rubrics drawn from the internet. At the end of the first year, teachers had shared personal documents, and often they had asked for comments from peers that might be helpful for improving their draft.
- Three quarterly one-day seminars had concerned all the actors. These sessions were designed by the research team, with the institutional team's agreement, and their agendas were communicated to the practitioner team through the website. A report of each seminar was made available on the website.
- Many meetings with teacher educators in order to improve teaching material and assessment tools with regard to each subject.

3.1.3. Rules

Many rules and devices were designed in order to pull the actors within the project.

- Two rules underpinned the EvaCoDICE project: cooperation is horizontal thus any can't refer to his or her position in order to convince others; teacher knowledge is always valuable –and improvable– since teachers experience teaching in classrooms all days along the project.
- Seminars had taken place in a very flexible room. Chairs and tables had been moved several times by seminar. Walls were used to pin posters. Works in-progress were shared and discussed easily through a video projector. A table was available for coffee and light foods.

- Regional and national meetings had required actors from the three teams for presenting the EvaCoDICE project to other teachers, heads of schools, and stakeholders.

3.1.4. Community and division of labour

The EvaCoDICE project was implemented in a sector where teachers and principals were used to cooperate. Some primary teachers had yet encountered some lower secondary teachers since they had discussed about their pupils. Inspectors described themselves as counsellors. Consequently, any major changes were expected on this part of the system.

3.2. IB-CPD program impacts on teachers approaches

The study will analyse the elements of the activity system which contribute to shape the action of the teachers involved in the project. The analysis is drawn on the discussion through the teachers during the focus groups. All their ideas were categorized according to the research model.

3.2.1. Teachers' objects and purposes

The first element of the activity system model consists of the teachers' objects and purposes. During the focus groups, teachers were asked to elicit how their approaches of assessment had changed during the project first year, in terms of objects and purposes. Six types of modification are noticed.

- Assessing for learning is becoming more important than assessing for marking or ranking.
- Assessing is becoming more focused and aligned on what is essential during the course.
- Assessing is conceived as an on-going process undertaking the inherent learning long time.
- Sharing a common vocabulary through the different teachers and subjects is seen as essential in facilitating students' understanding.
- Extending the project outcomes to others subjects or classes is shared by most teachers. Primary teachers had overcome scientific subjects and used the assessment methods in native language, for instance. Secondary teachers used these methods with the classes that are not concerned by the project.
- One teacher had explained that his comments about his pupils' work had totally changed since he replaced all humoristic (may be sarcastic) comments by positive and supportive interactions.

Teachers had suggested to dedicate the project second year to design, share, test and improve other formative assessment tools and methods.

3.2.1. Tools, signs and resources

The second element of the activity system consists of tools and resources that mediate teacher actions. During the focus groups, teachers were asked to elicit what tools and resources were useful in their approaches transformation. Seven sources of modification are noticed.

- The volition for making explicit and for sharing teaching material (course preparations and assessment tools) had been steered by the seminars themselves. Teachers explained that they had always wanted to interact like that but without a deadline that contrives them, they had always postponed this kind of interactions with their colleagues. A collective dynamic among actors and teams had been created by the project and that had supported the necessary efforts required by the program.
- Designing the seminars and the entire project as an inquiry had made the teachers more comfortable and confident in undertaking IBST methods with their own students.
- The positive interactions among the actors and teams and the entire respect of teacher knowledge had support the teachers in improving their practices.
- The pedagogical content knowledge provided by the research team was ranked as very helpful since, for instance, it had allowed the teachers to know and to foresee the students' usual mistakes or misconceptions with respect to a specific content.
- The goals and methods of the research team that had been explained and stressed as limited and focused had supported the teachers in the limitation and focusing of their expectation in their own classrooms.
- The location of each lesson within the whole curriculum, from primary to secondary classes, was helpful for a better understanding of the nature of the content, specifically for primary teachers.
- The use of the scientific equipment of the secondary schools by the primary teachers was very helpful in improving the consistence of their lessons and the experience of their pupils.

Teachers had suggested improving the students' responsibility in the assessment process. They like to design tools and methods that allow their students to formulate the criteria for assessing knowledge, skills and attitude toward a scientific problem.

3.2.2. Rules

The third element of the activity system consists of rules that shape teacher actions. During the focus groups, teachers were asked to explain what practical changes had occurred during the past year. Changes were grasped into five types:

- Courses anticipations are deepened since teachers focused on the knowledge that is requested by the problem resolution, on the nature of the hypothesis that might be tested by students and on the warrants that might be used to support their claims.
- Courses are more aligned with student progression than with official guidelines. Thus, teachers anticipated assessment methods allowing students to monitor and check their learning activities.
- Awareness of each student activity and reflection is shared by all teachers. They explained that all their students enter within the asked activity and are able to justify their strategies while most of them were passive at the beginning of the year and all the other past years.
- Transforming the collective organisation of a seminar in a collective organisation of the classroom is mentioned by a mathematics teacher. The method was: creating students' teams devoted to an aspect of a common problem, asking these teams to elaborate a poster about their results, matching groups of students with respect of each poster, rotating these groups in order to contrive each student to explain and to discuss each poster.
- Giving room for student reflection during the lesson is mentioned by a sport teacher. The method is: stopping the activity for two minutes maximum and asking dyads of students to mutually assess their activity, resuming the same activity and asking students to improve their strategies and performance.

Teachers had suggested making more explicit for students what will be expected during the lesson ('As a teacher, I'd like you to be able to...') and after the lesson (Strategies for homework).

3.2.3. Community and division of labour

As expected, teachers didn't explain any deep changes towards these elements. The only transformation concerned the way teachers conceived the research team: educational research methods and actors had appeared as reachable and understandable. Some teachers had seemed interested in educational studies: they read articles and heard videotaped lectures on internet.

4. Discussion

These results are aligned with other research. The first main characteristic of this kind of IB-CPD program is the '*push-pull* architecture' of the project: teachers and schools were both pushed and pulled into by 'voluntary participation, common bonding, professional inspiration, peer assistance, practical strategies, and technical supports' (Hargreaves & Fullan, 2012, p.138). The second is the project focus on a shared specific professional question that underpins the collective inquiry.

These results are consistent with the project expectations, thus they encourage in making the following steps!

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