Designing the Néopass@ction Platform Based on Modeling of Beginning Teachers' Activity

Serge Leblanc, Faculté d'Éducation, Université de Montpellier, France
Luc Ria, Institut Français de l'Éducation, École Normale Supérieure de Lyon, France

RESEARCH

Abstract
In the context of French teacher training — which does not sufficiently consider the professional problems faced by students when they enter the working world — we developed the *Néopass@ction* platform in view of proposing a reference base describing the real work of teachers. The platform is designed to serve at the national level as a resource either for web-based training, which the learner does alone, or for instructor-led training conducted in a classroom setting. The first section of this article begins with a description of the main difficulties identified in teacher education in France. It then gives a brief history of videotraining at the international level, followed by a presentation of how video-based training has evolved through the incorporation of the results of activity analysis. The second section describes the design of the *Néopass@ction* platform following several phases of coordination between research and training, based on theoretical assumptions about possible aids for achieving greater professionalism, and three different levels of activity modeling: real activity on the job, transformations of professional activity, and training trajectories for navigating on the platform. The processes that transform professional activity are precious aids for the "design-in-use" of the platform, which in turn is transformed in the light of professional progress made and the effects of its use on the activity of teachers in training.

Key words
beginning teachers, typical activities, professionalization, videotraining, design-in-use, modeling

Designing the Néopass@ction Platform Based on Modeling of the Activity of Beginning Teachers
The purpose of this article is to present the interplay between a research program entitled "Teacher Professionalism" and the design of a videotraining platform called *Néopass@ction* (Ria et al., 2010) grounded in the research results. It is part of a broader technological research project devoted to teacher education, elaborated from a definition of human activity resting on the assumptions of situated cognitive ergonomics, and aimed at creating a synergy, in the design of digital environments, between the objectives of research and those of teacher training. In this interplay, research contributes to designing digital artifacts and to structuring training devices, and in return, is fueled by data collected during training (Durand, 2008; Leblanc, Ria, Dieumegard, Serres & Durand, 2008; Ria, Leblanc, Serres & Durand, 2006).

Among the sources of information used for designing the platform are the critiques expressed regularly by student teachers or newly certified teachers about their occupational training, notably the fact that their teacher-education courses paid little attention to the concerns of beginning teachers and their classroom experiences. The training module developed from this platform is therefore not aimed at imparting the practices of expert teachers in a prescriptive manner, but at bringing to bear the real experiences and current practices of beginners in the classroom, in view of gradually transforming those practices in line with personal standards of feasibility and professional effectiveness. One of the design assumptions is that to facilitate the creation of links between real classroom experiences of platform users and their experiences during the viewing of training videos, the situations viewed must have some features in common with those already encountered by the users.

The platform was thus structured primarily from a series of videoclips presenting teaching sequences taking place in a classroom, along with interviews conducted during video viewing by the beginning teachers who taught during the filmed sequences. We also relied on interviews with other teachers (beginners and experienced teachers) and additional points of view provided by the researchers. The videoclips are organized in terms of professional themes. The theme "entering the classroom and putting students to work" – the focus of this article – uses what we call a "development filmstrip", i.e., a model of the typical steps describing how the practices of beginners are transformed as they develop their teaching skills and progress toward greater effectiveness (in terms of both subjective and objective criteria). The videos selected present lesson sequences taken from the materials used in earlier studies on beginning teachers (Ria, 2009, 2012). They correspond to the most representative examples for illustrating certain typical ways of proceeding or difficulties encountered by beginners (Leblanc & Veyrunes, 2012). Such videoclips are potential resources for training beginning teachers, whether via remote self-training or instructor-led training in an educational institution.

The present article begins with a description of the main difficulties identified in teacher education in France,

followed by a brief history of videotraining at the international level, and a presentation of how video-based training has evolved through the incorporation of the results of activity analysis. The article goes on to describe the design of the *Néopass@ction* platform following several phases of coordination between research and training, based on theoretical assumptions about possible aids for achieving greater professionalism and three different levels of activity modeling (real activity on the job, transformations of professional activity, and training trajectories for navigating on the platform).

A. The Current Situation

1. Paradoxes of Teacher Education in France

A recent report[1] on France's teacher-training reform stressed that education students are not well prepared for the professional challenges they will have to face in this occupation. According to the report, individuals who have obtained a university degree and successfully passed the competitive examination for entry into France's National Education System have achieved access to an occupation for which their professional training has not offered them any true preparation. As a result, new teachers may experience this "abrupt" entry into the working world as highly problematic or even traumatic. Those who experience genuine difficulties in managing their classes may decide prematurely to abandon their chosen occupation. Although only a few actually do so (less than 10% in France), many new teachers evoke this possibility. Added to the lack of assistance to new teachers as they take their first steps on the job is the fact that teaching, as a profession, is becoming more and more difficult worldwide (Maroy, 2006).

The problematic context in which beginning teachers massively replace their seniors is accompanied by a threefold state of doubting: (a) "identity doubting" linked to the loss of the symbolic and cultural value conferred by a social function that no longer holds the monopoly of knowledge and no longer guarantees its role as a social ladder, (b) "pedagogical doubting" about one's ability to teach without sufficient landmarks, and without foreseeable ways of enlisting and teaching audiences who are less and less inclined to play the student role, and (c) "self-doubting" about one's ability to keep on going in an occupation which, in certain contexts, proves to be both physically and psychologically exhausting (Ria, 2009). This situation in France is paradoxical insofar as several international reports agree in saying that improving the quality of teaching is a major priority today, especially in Europe (European Commission, 2010). This doesn't mean, however, that there exists an ideal solution for training teachers. Admittedly, at the international scale no true consensus has been reached among researchers, policy decision-makers, and those responsible for devising training programs that include the most important things a teacher needs to know (Schwille & Dembele, 2007). How, then, can one assist these beginners who, in France, are usually well-educated in terms of academic knowledge but are much less well-equipped when it comes to pedagogical knowledge? What can we do to provide them with tools for setting up the anchor points they need to gradually stabilize their professional activity? This is a highly critical question if we want to keep this new generation of teachers working in the profession (Smethem, 2007).

To prevent beginners from having to fend for themselves in such a precarious situation, the highest priority – while it seems difficult to directly modify the conditions under which teachers must exercise the occupation – is to design training devices that are able to better prepare them, ones that will accompany them as they enter this renovated profession no longer idealized or grounded in certain once-firmly-held beliefs about a kind of schooling that no longer exists. To break ground, new teacher-training approaches must learn from the past, in particular by taking a serious look at the critiques expressed regularly by student teachers about the education courses they received at the IUFM[2] (Rayou & van Zanten, 2004). First of all, student teachers have often expressed the feeling of not being sufficiently heard and even sometimes of being treated like children, in a curriculum not properly geared to adult learners and out-of-phase with the concerns of beginning teachers. Some student teachers have handled this problem by developing strategies aimed at concealing their professional difficulties in order to cope with evaluation and certification procedures at the end of basic training. Secondly, the heterogeneous content of the IUFM courses tended to be packed into extremely small spaces and time periods, and to be ridden with sometimes exaggerated symbolic oppositions between theory and practice, between training institution and occupational terrain, between university staff and working practitioners, between beginners and experts, between discipline-specific and cross-discipline approaches to the teaching profession. These areas of cleavage have generated many misunderstandings and considerable frustration among student teachers, who have sometimes fled these "places of conflict" and developed parallel learning networks for informal exchange (Serres & Ria, 2007).

[1] Entitled "Masterisation de la formation initiale des enseignants" directed by Jean-Michel Jolion (2011).

[2] IUFM's or Instituts Universitaires de Formation des Maîtres (University Institutes for Teacher Education) were created in France in 1991 and then replaced in 2013 by the Higher Schools of Professorship and Education (Écoles supérieures du professorat et de l'éducation).

In the light of these considerations, the *Néopass@ction* development project at the French Institute of Education[3] set out in 2010 to spur new orientations in the design of training devices to accompany beginners as they enter the profession. It is rooted more broadly in a research trend in education devoted to meeting ever-increasing international demands (Tardif, 2010) by striving to make the teaching activity intelligible to educational practitioners and instructors. This endeavor is based on the conviction that one of the keys to improving our education system lies mainly in pedagogical practices and the transmission of occupational know-how among teachers in the field (McKinsey, 2010), where research can play a decisive role. Concretely speaking, the project proposes a reference base describing the real work of teachers. It was designed to serve at the national level as a resource for beginning teachers, either in the form of web-based training which the learner does alone (student teachers or newly certified teachers) or for instructor-led training supervised by a university professor (Master's students) or a tutor (student teachers). The objectives and uses of the platform's videotraining devices are to be situated with respect to those of the many other past and present video-based practices used in teacher education.

2. History of Video-Based Teacher-Training Devices

The first experimentation with microteaching using a video device was done at Stanford University by Allen and Ryan back in 1963. These authors wanted to simplify the teaching process, deemed too complex, by reducing the number of students and the duration and content of lessons, and by focusing on repetition of a specific teaching skill, which was filmed and analyzed by an instructor, who then provided feedback (Allen & Ryan, 1969). Their video-based approach posed at least three types of problems: (a) a distorted view of school reality due to the use of an artificial situation far-removed from the complexity of the classroom, (b) the potential irrelevance of the targeted skills, chosen solely by researchers, and (c) theoretical reductionism caused by exclusive focusing on observable behaviors and failure to take processes and context into account.

This training approach then underwent several transformations. In the early 1970's, it was taken up and refashioned by France's teacher education schools (*Écoles Normales*), at which point it become more diversified with the addition of "*videotraining*" characterized by the use of video recordings deemed to represent the real teaching world and its ways of thinking, with actors engaged in the training process (Mottet, 1997). For about fifteen years after that, the problem of training was addressed in terms of three major types of video-based processes: (a) "*video-control*" aimed at reproducing behaviors judged effective, (b) "*video-mirroring*" revolving around self-observation and self-analysis, and (c) "*video-exploration*" aimed at questioning the filmed teacher's ways in order to elicit a professional learning-development process. During the 1980's, laboratories conducting pedagogical trials attempted to synthesize and generalize what was learned from earlier cases of videotraining, on the basis of a principle that gave substance to the relationship between theory and practice: "*learning by doing and reflecting upon one's doings, with the help of others' points of view*" (Mottet, 1997:64).

Between 1985 and 1990, all of these devices gradually disappeared as training constraints became increasingly great and even contradictory. The creation of the IUFM's in France (1991) could have re-boosted videotraining practices by advocating an alternating work-study approach. But the devices for analyzing teaching practices began to multiply and to be grounded more on hindsight or on written documentation about the practice, than on video-based materials. The few attempts to extend the use of videos, notably with secondary school teachers, brought new difficulties to the fore, both ethical and methodological (Mottet, 1997).

At the same time in the United States, training based on multimedia video cases (e.g., Koehler, 2002) began to emerge in the mid-90's. The cases in question were either episodic cases exemplifying key notions in a given domain (e.g., a teacher's reformulation of something a student said), or narrative cases that described the structure of teaching-learning episodes (taken as cases) by pointing out causal relations between them. In the trend called *evidence-based learning* (and in line with the model used in medicine or law), educational methods are grounded on casuistic techniques that bring out causal relations between teaching practices and their effects. This approach extended the positivist orientation of education research, which contends that human phenomena are reducible to top-down causality laws, and that simply isolating these laws suffices to reproduce (or avoid) the desired chain of teaching actions. Transforming school in this case, requires identifying and prescribing the "*right way to teach*".

Other recent studies have moved away from observing the teaching process, in order to look instead at the learning process or the activity of students, which act as the starting point for training (e.g., Rodgers, 2002). In this approach, then, to train teachers one must understand

[3] Institut Français de l'Éducation de École Normale Supérieure de Lyon: www.ife.ens-lyon.fr

how students think and learn. The work by Sherin and Han (2004) on video-based teacher training showed that participation in a video club helped future teachers learn their trade and contributed to the development of a professional culture. The authors found evidence of a progression in the discourse used by teachers as they attended more and more video club meetings where videos of the classroom were shown. At the first meeting, the participants' comments mainly referred to pedagogical problems, whereas during the seventh meeting, the problems identified were about the students' mathematical conceptions. It was not until the fourth meeting that a correspondence between the teacher's pedagogical approach and the students' ways of thinking was established.

3. Comeback of Videotraining Based on Work-Analysis Frameworks

Our videotraining approach, which is based on work analysis, breaks away from the above approaches in several respects, including its aims, which are both transformational and epistemic, and its direct link to research results. This research-based approach to the design of training devices strives to construct simulated situations based on real-activity analysis, and then to confront the concerned actors using a learning-development approach to situations in which interactions with others play a fundamental role (Pastré, 2005). We thus attempt to overcome the limitations of earlier approaches stemming from (a) their aiming for the acquisition of behaviors, skills, attitudes, or competencies that neglect the complexity and "*naturalness*" of the work of a teacher, (b) a causality-based design that sees the teacher's actions as resulting from external causes, and the student's learning as resulting from the teacher's actions, (c) a "*task-oriented entry*" into training caused by their failure to make a distinction between task and activity and their purely prescriptive stance that ensues, and (d) their lack of – or insufficient articulation between – what research has learned in terms of knowledge of the classroom or the teaching process, and their conception of training.

As a counterpart, a number of training devices that utilize video episodes taken from research corpora and backed by theories of activity are currently being developed (Durand, 2009; Saussez & Yvon, 2010). In this line, our approach is based on an analysis, in "*natural*" classroom settings, of the individual and collective activity of both teachers and students, with models of that activity founded on those analyses and the design of training devices resting on the models. The use of video media, enhanced by various forms of confrontation with traces of one's own activity (Mollo & Falzon, 2004), is a key to achieving these goals. The video corpora are scenarized and used for training during collective confrontation sessions in which a group of actors comment upon the recordings of one or more actors.

Although this video-corpus approach to teacher training may be seen as a reappearance of videotraining methods, it differs from them in the following respects (in addition to its natural setting and consideration of the actor's experience): (a) the analyst-participant rapport is based on gaining the learner's trust by adopting an empathic attitude, strict rules of ethics, and the shared goal of transforming the activity; (b) group use of videos is done in accordance with the meanings, concerns, and reasons behind the actions of the observed teacher; (c) the focus is on the construction of temporary forms of activity for coping with the tensions of the profession rather than on the acquisition of univocal occupational standards. Taking the actors' point of view into account to fully describe their experience strongly reduces the fear of being filmed and avoids the ethical problems posed by other approaches.

From this angle, the modalities used for videotraining (Leblanc & Veyrunes, 2012; Sherin & van Es, 2009) can come in various forms in which individuals or groups of learners practice describing, explaining, analyzing, and evaluating the teaching process without forcing beginners to directly expose their own activity (or only gradually so by way of the activity of peers). The purpose of this training environment is to propose new hybrid forms that alternate between training modalities that are usually opposed to each other, but which we see as potentially complementary, including in-classroom and remote training, self-training and co-training, training that starts from the beginner's activity and training that draws from the expert teacher's activity, discipline-specific and cross-discipline training, etc.

B. The Design Process

1. Linking the Activity Analysis to the Design Process

The design of the *Néopass@ction* platform illustrates: (a) the benefits of an iterated approach with constant revision throughout the ongoing process of design-in-use (Norman, 1993; Rabardel, 1995; Theureau, 2003), itself based on an "*experiential*" approach (Leblanc, Saury, Sève, Durand & Theureau, 2001), and (b) a collaboration process aimed at fostering dialogue between teachers and instructors and between beginners and experienced teachers, with dynamic and open relations between research and training (Durand, Ria & Veyrunes, 2010). The five design phases of the platform (Figure 1) account for this dual process (Ria & Leblanc, 2011).

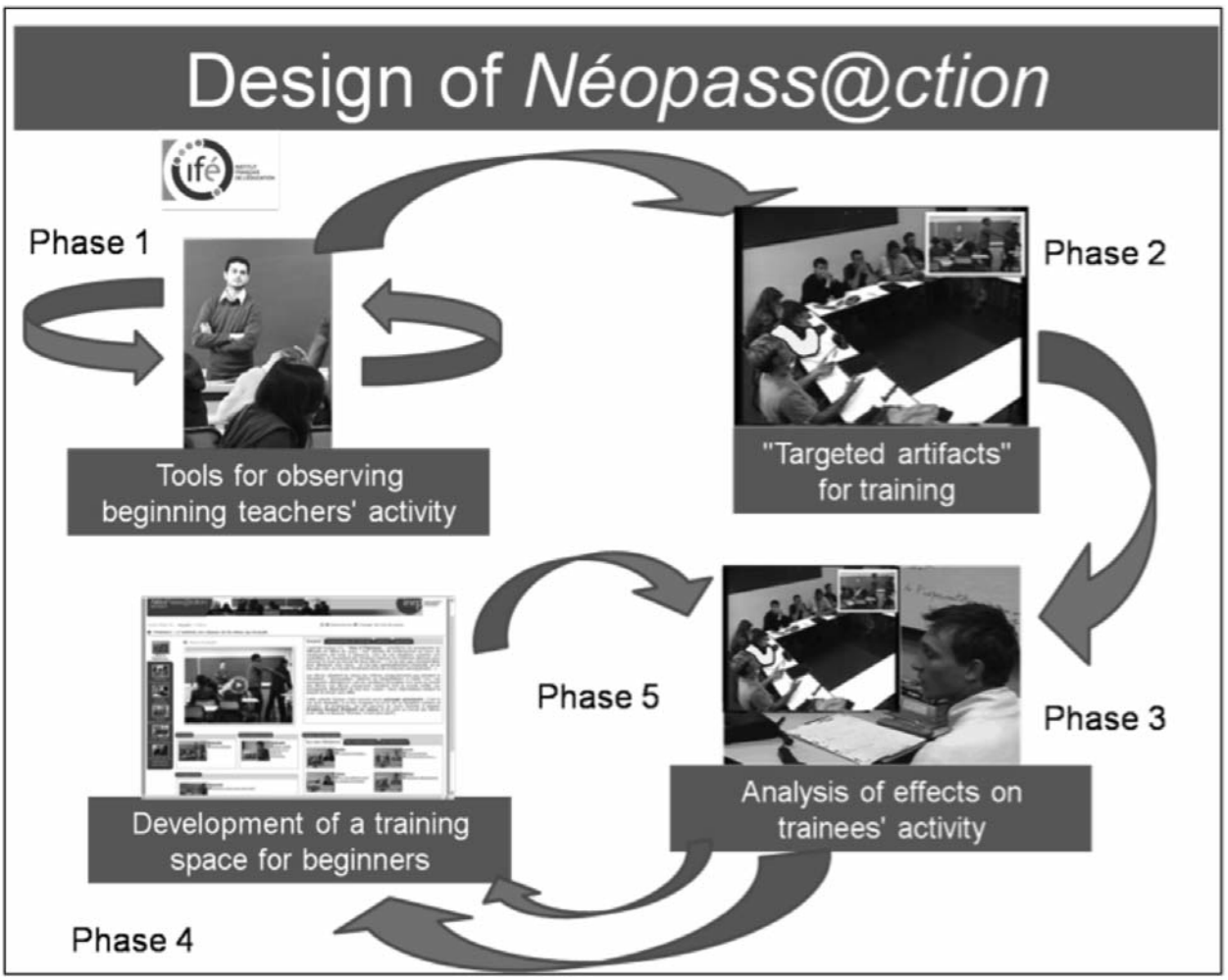

Figure 1. Design phases of the Néopass@ction teacher-training platform (Ria & Leblanc, 2011).

The first phase consisted of developing a set of tools for observing the real work of new teachers who volunteered to take part in the research (still in progress). The purpose of this phase was to identify the ways in which these teachers manage to adapt to their work environment, over long periods of time, by devising strategies for action and making compromises between personal viability standards and the standards set by the educational institution (Ria, 2009, 2012).

The second phase consisted of selecting some of the models output from our analysis of the real work of these novices and making them into "*targeted videoartifacts*". These artifacts had to exemplify the activity of a beginner sufficiently well to be used as "*reference situations*" for training, in direct connection with the immediate or short-term concerns of beginning teachers.

The third phase involved a systematic search for the effects that the "*targeted videoartifacts*" had on the activity of the future teachers or student teachers, in training or in the classroom.

Backed by the lessons learned in the first three phases, the fourth phase consisted of designing a training environment that proposes the "*targeted videoartifacts*" most representative of the concerns of beginners, and then arranging and scenarizing them to create a potential activity-transformation space.

The fifth phase involved conducting numerous presentations and training sessions in a wide variety of sectors (French Ministry of Education, the Senate, United Nations Educational Scientific and Cultural Organization, scientific communities, teacher-training courses for beginners organized by France's rectorates or universities,

training courses for instructors at the regional or national level, etc.). These allowed us not only to get a better overall grasp of the relevance and viability of the training platform in a French context undergoing profound teacher-education reform, but also to assess its "*acceptability*" in the concerned professional circles.

2. Modeling the Teaching Activity on the Job or in Training for Use in Developing Videotraining Situations

Our design approach is rooted in professional didactics. It consists of generating simulated situations based on an analysis of real work activity, confronting trainees with an approach to professional learning and development (Pastré, 2005), and analyzing the transformations brought about in the activity of the different actors. To utilize this "*dually-oriented activity*" approach to design and to conduct ergonomic follow-up of training, we simultaneously explored and developed three levels of analysis-modeling useful for creating and enhancing this environment: (a) a model for analyzing real activity on the job, (b) a model for analyzing transformations of professional activity, and (c) a model for designing possible navigation routes in the platform. The first model reconstructs beginning and experienced professional activity based on the main dilemmas the teachers identified as being activity-situation couplings that were crucial, critical, or typical of the occupation; these constitute central points in the professional learning-development process. The second model shows the transformations of their activity on the job, over long time periods (6 months to several years), based on the identification and hierarchical arrangement of "*temporary activity patterns*" specific to a given teacher or several beginning teachers; these reflect different forms of effectiveness. The third model describes some vectors of learning-development in training; it is based on an analysis of the activity transformations exhibited by the trainees and instructors in these innovative environments.

2.1 Modeling Real Professional Activity for Use as a Training Anchor Point or Target

The first level of analysis-modeling strives, above all, to model the professional activity of beginning and experienced teachers. The resulting models are organized into themes representing occupational dimensions that are both critical for beginners, to the extent that they constitute important learning-development challenges, and also crucial for the profession because they are a constant source of tension in the work of experienced teachers (e.g., entering the classroom and putting students to work; getting elementary school pupils to talk). Modeling these courses-of-action is aimed at making visible the typical difficulties encountered in this occupation and at offering potential ways of overcoming them, in view of helping teachers (beginner or otherwise) to anticipate and transform their activity.

These models, as training resources, are built upon the results of an analysis of videocorpora from classroom and self-confrontation sessions that shed light on the internal organization of the teaching activity. The analysis is carried out in two stages. The first is an activity-deconstruction stage that breaks down and identifies the components of what the filmed teacher was experiencing (actions, concerns, perceptions, emotions). The second is a global reconstruction phase that reconstructs the actor-environment coupling and the meaning of the activity from the teacher's point of view. Following the analysis, each typical activity is described using certain pairings considered prototypical by peer groups (Leblanc & Veyrunes, 2012). The next two steps are finding typical occurrences, and then choosing videoclips (showing that particular way of doing things) and self-confrontation verbalizations (that explicate the components of the teacher's activity) (Table 1). After that, the typicality of these occurrences is confirmed not only by the concerned teacher, who points out these recurring elements, but also by exchange sessions between peer groups and comparisons with already published studies on.

Classroom videos and teachers' professional experiences thus represent the best instances for illustrating particular ways of doing things or difficulties. And an analysis of them reconstructs those recurring experiences by identifying the different components of the activity in terms of typical perceptions, typical intentions, typical emotions, and typical knowledge (Theureau, 2004). These models tell us not only about the activity itself but also about its effective components, the difficulties it involves, and its transformation dynamics. Effectiveness is approached from the angle of its double valence (Saujat, 2004), that is, "*objective*" (in relation to the actions accomplished with students) and "*subjective*" (in relation to the search for professional well-being, efficacy, and enjoyment in the exercise of the self).

2.2 Modeling Transformations of the Work Activity as "Temporary Activity Patterns"

The second level puts out a model for analyzing transformations of professional activity. Rather than remaining in the typical lopsided position found in approaches that oppose novices and experts, which always leads to talking in terms of lacks with respect to an

Videoclip and photo representing the typical activity	Perceptual cues during this typical activity
	• Experience of repeated clashes with students at beginning of school year • Risk of making the clash worse by using solely repressive discipline • Unending negotiations with students provide fuel to "contagious hot spots" **Concerns during this typical activity** • Talking firmly but courteously with misbehaved students • Making students abide by school rules • Waiting patiently until students settle down to work
Excerpts of verbalization during self-confrontation *"I try not to clash with these students. I know they'll get to work ... Even if I don't know how long it will take... In fact, it doesn't depend on me..."* *"I'd rather stay calm and especially not react to provocations..."*	**Knowledge applied to this typical activity** • Students often come back all wrought-up after recess or a previous class • Each one must be talked to individually to defuse clashes • Authoritarian and aggressive attitudes are not effective with older students • You have to wait until students are quiet before giving instructions • Order in the classroom is a prerequisite to starting to work

Table 1. Components of a typical activity used to put students to work, and related observations (Ria, 2010).

inaccessible ideal, we focus on beginning teachers' "*temporary activity patterns*" reflecting different forms of effectiveness. Gaps between these temporary patterns correspond to "*silent transformations*"[4] taking place in the teacher's experiential world and rooted in the "*modification-continuation*" coupling (Jullien, 2009). This coupling allows us to simultaneously grasp deviations in the activity that represent new ways of doing things and reveal both profound changes and forms of professional stability. From this perspective on the professional transformation process, our descriptions and analyses of a teacher's activity at different moments along his/her trajectory are not aimed at prescribing what should be done, but rather at pointing out how a given professional situation might unfold and bend more or less effectively in accordance with the teacher's current dispositions for acting. The actions, concerns, foci, beliefs, and knowledge brought into play by beginners thus constitute important anchoring points in our training module, not for stopping there, but to better identify the conditions under which the situation can move in the desired direction.

From this angle, the transformations are uncovered either by describing the organizing principles of the activity of a given teacher at t1 and t2,[5] or by hierarchically arranging several "*temporary activity patterns*" taken from various beginners or near beginners who exhibit greater or lesser effectiveness in the concerned situation. Multiple models like these account for possible professional trajectories in terms of transformations of the teaching activity. For example, in his longitudinal case studies, Ria (2009, 2012) identified typical ways of starting a class and putting students to work, and then modelled and ranked them with respect to each other on the basis of criteria such as classroom listening climate, quality of individual exchanges, time taken for students to start working, the stakes of learning-development attached to the work, and the teacher's emotional state. The models must account for this dynamic in terms of potential professional development (Leblanc & Ria, 2010; Ria, 2010). They must be based on changes in the teachers' preoccupations and concerns, such as (a) maintaining control over the most difficult students via dialogue in order to cope with general classroom uproar or isolated disruptions by class leaders, (b) enlisting students as they enter the classroom by assigning individual written tasks to get them to settle back down and anticipate the rest of the lesson, and (c) setting up an individual greeting area at the door to prepare students for the territory change, and rapidly enlisting students by questioning them on learning material that

[4] Jullien (2009) calls these transformations "*silent*" because they take place nearly *unknowingly*, without being noticed. In aging, for example, grey hair is one of the most visible signs of an overall, continuous process.

[5] t1 and t2 can be spaced several weeks to several years apart.

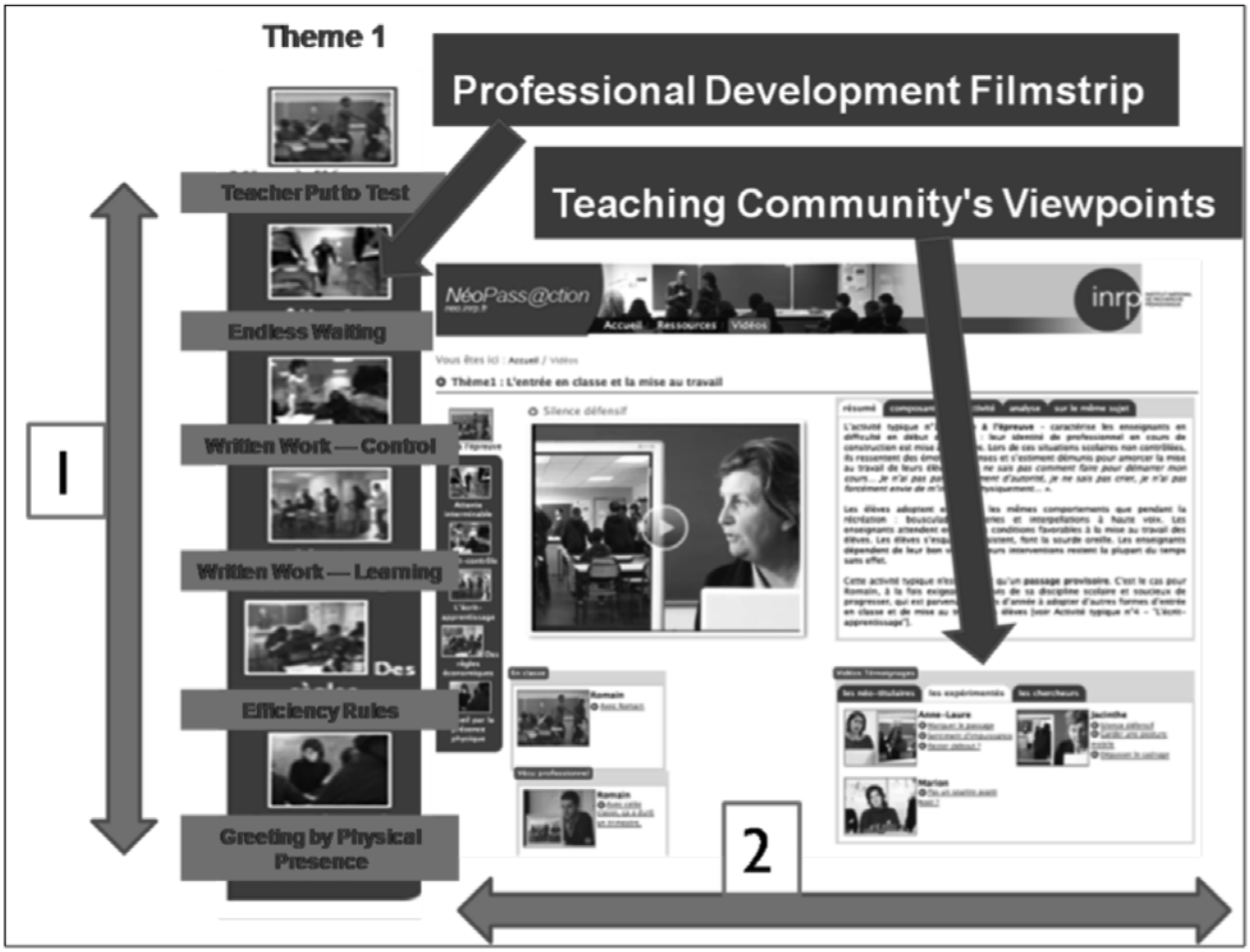

Figure 2. Dual model: (1) Transformations of the professional activity of teachers in a vertical "filmstrip". (2) On the horizontal axis, occupational learning-development routes, going from testimonies of novices to those of more experienced teachers.

arouses their curiosity and interest. These models foresee future situations and can help orient the educational trajectories of trainees by addressing their concerns and expectations as they start to teach.

The design of the *Néopass@ction* platform incorporates this notion of possible professional trajectories using two types of models (Figure 2): a learning-development model depicted as a vertical filmstrip[6] (here, from "*putting to the test*" to "*greeting by physical presence*"), and a model of the "*teaching community's viewpoints*" based on the interrelationships between the comments of newly-certified teachers, experienced teachers, and researchers. The models are designed to foster both the removal of guilt feelings among beginners by enabling them to identify the temporary, non-mandatory phases characteristic of a community of beginners as they learn the trade, and the transformations of their dispositions-to-act through the detection of the dynamics of those transformations.

2.3 Modeling the Learning-Development Activity as It Unfolds During Training

The third level proposes a model for designing possible navigation trajectories in the platform. Starting from partial anticipation of future users' expectations and concerns along with speculations about their desired intentions, the "*media-based scenarization*" stage (Henri, Compte & Charlier, 2007) consists of organizing a set of meaningful units in a non-linear way that does not resemble detailed

[6] The "*development filmstrip*" is a vertical "filmstrip" on the left side of the platform screen (see Figure 1). For a given teaching situation (e.g., greeting students and starting to work for Theme 1), it corresponds to a model of the typical stages of activity transformation among beginning teachers, from the least to the most well-mastered (for more details, see Ria, 2009).

pre-planned navigation routes to be imposed upon users (Hotte, Godinet & Pernin, 2007). Here, scenarization consists instead of creating "*encouraged action spaces*" (Durand, 2008) offering possibilities for professional learning-development by means of a device that relies on "*the propensity of things*" (Jullien, 2009), i.e., a device that tends to multiply points of view and ports of entry in order to promote the emergence of meanings that are not "*encapsulated within symbols*" (Winograd & Florès, 1989).

To generate these scenario-designing models, one must identify descriptors of the learning-development activity carried out by the environment's users, i.e., the most characteristic features of their activity and relationships between them. These features describe the process of exploration-inquiry-learning-development and the new action perspectives generated during navigation (Theureau & Jeffroy, 1994). They pertain to (a) that which is perceived in the situation, (b) that which is constructed, and (c) that which helped the user to get and stay involved in the exploration-learning-development situation.

Perceptions of the situation translate concretely into meaningful information for users in the course of their navigations through the video, iconic, and textual resources, all of which act either as "*observation primes*" or occupational know-how. Observational anchoring occurs when, during video viewing, the observer recognizes a professional situation already encountered, noticing its similarity to the context and behaviors observed in school and to the experiences described by peers. The occupational know-how contained in these resources is not transformed into knowledge of the viewed classroom situation possessed by the user unless it becomes meaningful in the current interpretation framework.

Concerning what gets constructed, we can distinguish new action modes that will potentially be used in the classroom, interpretive chains that will enrich comprehension of the viewed situation and also one's own professional situation, and new ways of seeing and becoming part of a professional community. The module's capability of changing the time scale (short-, middle-, and long-term) for analyzing and detecting significant changes in the teachers' activity – changes that point to the visible emergence of these "*silent transformations*" – provides a different slant on the user's own professional development. Rather than claiming to re-configure the teacher's occupational situation on the basis of an expert model imposed and ordered from the outside, the device seeks to induce effects by discreetly triggering the detection of manifest and meaningful modifications via the comparison, in the same situation, of a single teacher's activity after a few months, the activity of several beginning teachers over a period that includes equivalent experiences (a few months to one year), and/or the activity of more experienced teachers (6 to 7 years).

The levers that foster and sustain user engagement in this exploration-learning-development process can be sorted into five kinds of "*situational catalyzers*" (Theureau & Jeffroy, 1994): current concerns, the user's teaching experience, projection into a situation in the near future, identification of high-priority professional problems linked to those concerns, and availability in the environment of resources useful for the learner's purposes. To promote the creation of links between the user's prior classroom experiences and his/her immediate experience with it (and future experiences too), the situations viewed in the videos of peers, and their experiences as well, must have shared features or a "family resemblance" with ones already encountered. By stimulating the search for similarities and differences with respect to one's own ways of doing things and their organization, the training module favors user involvement. It is this likeness of experience that enables the actors to become aware of the different components of the activity they carry out in this type of situation.

To stimulate and demonstrate possible exploration-learning-development routes for navigating on the platform, the training module gives examples of pedagogical scenarios based on the analysis of the assisted navigation activity of trainees. These examples were elaborated by reconstructing chains of interpretation as trainees navigated through the entire *Néopass@ction* platform, and then relating them to comments by the instructors. The goal is to recreate an "*encouraged action space*" which, by way of its design, is capable of leading to the following: (a) noting that specific aspects of the teaching activity at play and unfolding in the classroom have a good chance of generating such and such an effect or effects, (b) identifying unique ways of doing things while recognizing what is typical and shared in the different experiences described, (c) noticing, based on certain features that start showing up in the situation, that it is still possible to "*correct*" or modify the pattern, or on the contrary, that it is too degraded and another pattern must be adopted, and (d) appropriating what is perceived by other users as an accessible source of relevant progress, again, given each one's current dispositions for action. The idea is to compile a reference base containing those teaching situations that are the most "*fruitful*" for the professional development of novices, by systematically reframing the stakes of the discipline-specific know-how,

with, as its the yardstick, the problems that arise in the professional activity under construction.

Conclusion

This toolbox for observing the real work of beginning teachers, taken from a video-based research corpus, allowed us to model their typical experiences in professional situations they deemed problematic. It also enabled us to detect the ways in which they managed to adapt to their work environment in the long-term (one or more years) by adopting strategies for action and making compromises between their own standards of professional viability and the standards set by the educational institution. The first empirical studies aimed at determining the effects of videotraining on beginning teachers pointed out the merits of this type of environment in bridging the gap between.

Exploratory studies on the activity generated by the use of the *Néopass@ction* platform (Leblanc, 2012; Leblanc & Sève, 2012; Lussi Borer & Muller, forthcoming; Ria & Leblanc, 2011, 2012) have already identified the following effects: (a) reassurance and removal of guilt among beginning teachers thanks to their new awareness of the more or less inevitable passages they must go through to acquire skills in this occupation, (b) spontaneous recall of real experiences favored by video-based classroom situations possessing a "*family resemblance*" with their own ways of exercising the profession, (c) comparison of users' real experiences, not only with experiences presented in classroom videos but also with "*professional experience*" videos and/or "*commented*" videos, allowing them to evaluate their own practices as they see themselves through the eyes of others, and (d) projection into the future leading to the anticipation of as-yet-unknown scenarios, and foreseeing other possible ones to be tested in one's own classroom, while drawing from experience acquired by peers.

In the end, the support provided by these three levels of modeling helps trainees better understand complex teaching know-how and improves their ability to analyze their own activity. It also enhances meaningful links between the skills they acquired during video analysis and their own professional actions. Lastly, follow-up of transformations in the trainees' professional activity, resulting from comparisons between what they perceive in a filmed-commented situation and what they do in their classroom, appears to be a powerful key to professional development. But this link generally remains implicit during training, and for the time being, researchers must settle for postulating that users will engage in a self-analysis that will be useful to them, if not for acting directly then at least for recognizing the corresponding professional situations in the field. Moreover, it is a difficult task for researchers to deconstruct and reconstruct the complex process of establishing relationships among the real experiences of actors taking place in different spaces (in training, on the job) and over long time periods of time (a semester, one or more years).

References

Allen, D., & Ryan, K. (1969). *Microteaching*. London: Addison-Wesley.

Cahour, B., & Falzon, P. (1991). Assistance à l'opérateur et modélisation de sa compétence. *Intellectica*, 12(2), 159-186.

Durand, M. (2008). Un programme de recherche technologique en formation des adultes: une approche enactive de l'activité humaine et l'accompagnement de son apprentissage/développement. *Education & Didactique*, 3(2), 69-93.

Durand, M. (2009). La conception d'environnement de formation sous le postulat de l'enaction. In M. Durand & L. Filliettaz (Eds.), *Travail et formation des adultes* (pp. 191-225). Paris: PUF.

Durand, M., Ria, L., & Veyrunes, P. (2010). Analyse du travail et technologie de formation: signification et organisation de l'activité des enseignants. In F. Saussez, F. Yvon & F. Loyola (Eds.), *Analyser l'activité enseignante: des outils méthodologiques et théoriques pour l'intervention et la formation* (pp. 17-39). Québec: Presses de l'Université de Laval.

European Commission (2010). Setting up Consistent and Systemic Initiation Programs for Beginning Teachers: Manual for Use by Policy Decision-makers. ec.europa.eu/education/school-education/doc/handbook0410_fr.pdf

Henri, F., Compte, C., & Charlier, B. (2007). La scénarisation pédagogique dans tous ses débats. *Revue internationale des technologies en pédagogie universitaire*, 4(2), 14-24.

Hotte, R., Godinet, H., & Pernin, J.-P. (2007). Scénariser l'apprentissage, une activité de modélisation. *Revue internationale des technologies en pédagogie universitaire*, 4(2), 7-13.

Jullien, F. (2009). *Les transformations silencieuses*. Paris: Grasset.

Koehler, M.J. (2002). Designing Case-Based Hypermedia for Developing Understanding of Children's Mathematical Reasoning, *Cognition and Instruction*, 20-2, 151-195.

Leblanc, S. (2012). *Conception d'environnements vidéo numériques de formation. Développement d'un programme de recherche technologique centré sur l'activité dans le domaine de l'éducation*. Unpublished summary note for accreditation as a research director. Université Montpellier 3.

Leblanc, S., & Ria, L. (2010). Observatoire de l'évolution de la professionnalité enseignante et dispositifs de formation de simulation vidéo. In G. Baillat, D. Niclot & D. Ulma (Eds.), *La formation des enseignants en Europe. Approche comparative*, (pp. 255-265). Brussels: De Boeck.

Leblanc, S., Ria, L., Dieumegard, G., Serres, G. & Durand, M. (2008). Concevoir des dispositifs de formation professionnelle des enseignants à partir de l'analyse de l'activité dans une approche enactive. *@ctivités*, 5(1), 58-78.

Leblanc, S., Saury, J., Sève, C., Durand, M., & Theureau, J. (2001). An analysis of a user's exploration and learning of a multimedia instruction system. *Computer & Education*, 36(1), 59-82.

Leblanc, S., & Sève, C. (2012). Vidéo formation et construction de l'expérience professionnelle. *Recherche et Formation*, 70, 47-60.

Leblanc, S., & Veyrunes, P. (2012). Vidéoscopie et modélisation de l'activité enseignante. *Recherche et Formation*. 68, 139-152.

Lussi Borer, V., & Muller, A. (forthcoming). Quel apport/usage du "voir" pour le "faire" en formation des enseignants du secondaire. In L. Paquay, M. Altet, J. Desjardins, R. Etienne & P. Perrenoud (Eds.), *Prendre en compte le travail en formation des enseignants*. Brussels: De Boeck.

Maroy, C. (2006). Les évolutions du travail enseignant en France et en Europe: facteurs de changement, incidences et résistances dans l'enseignement secondaire. *Revue Française de Pédagogie*, 155, 112-142.

McKinsey France (2010). "Les clés de l'amélioration des systèmes scolaires", www.mckinsey.fr

Mollo, V., & Falzon, P. (2004). Auto- and allo-confrontation as tools for reflective activities. *Applied Ergonomics*, 35(6), 531-540.

Mottet, G. (1997). *La vidéo-formation*. Autres regards, autres pratiques, Paris: L'Harmattan.

Norman, D. A. (1993). *Things that make us smart. Defending human attributes in the age of the machine*. New York: Addison-Wesley.

Pastré, P. (1995). Problèmes didactiques posés par les simulations. *Performances Humaines et Techniques*, 75/76, 44-53.

Pastré, P. (2005). Apprendre par la simulation. *De l'analyse du travail aux apprentissages professionnels*. Toulouse: Octarès.

Rabardel, P. (1995). *Les hommes et les technologies*. Paris: Armand Colin.

Rayou, P., & van Zanten, A. (2004). *Enquête sur les nouveaux enseignants. Changeront-ils l'école?* Paris: Editions Bayard.

Ria, L. (2009). De l'analyse de l'activité des enseignants débutants en milieu difficile à la conception de dispositifs de formation. In M. Durand & L. Filliettaz (Dir.), *Travail et formation des adultes* (pp. 217-243). Paris: PUF.

Ria, L. (Ed.) (2010). Plateforme de formation en ligne *Néopass@ction* de l'Institut Français de l'Education de l'École Normale Supérieure de Lyon. http://neo.ens-lyon.fr/neo

Ria, L. (2012). Variation des dispositions à agir des enseignants débutants du secondaire: entre croyances et compromis provisoires. In P. Guibert & P. Périer (Eds.), *La socialisation professionnelle des enseignants du secondaire. Parcours, expériences, épreuves*, (pp. 107-125). Rennes: Presses Universitaires de Rennes.

Ria, L., & Leblanc, S. (2011). Conception de la plateforme de formation Néopass@ction à partir d'un observatoire de l'activité des enseignants débutants: enjeux et processus. *@ctivités*, 8(2), 112-134.

Ria, L., & Leblanc, S. (2012). Professionnalisation assistée par vidéo: Les effets d'une navigation sur Néopass@ction. *Recherches et Educations*, 7, 99-114.

Ria, L., Leblanc, S., Serres, G., & Durand, M. (2006). Recherche et formation en "*analyse de pratiques*". *Recherche et Formation*, 51, 43-56.

Rodgers, C. R. (2002). Seeing student learning: Teacher change and the role of reflection. [Electronic version]. *Harvard Educational Review*, 72(2), 230-253. Retrieved August 8, 2003, from /http://www.edreview.org/ harvard02/2002/su02/ s02ordg.htm

Saujat, F. (2004). Comment les enseignants débutants entrent dans le métier. Formation et pratiques d'enseignement en questions. *Revue des HEP de Suisse Romande et du Tessin*, 1, 97-106.

Saussez, F., & Yvon, F. (Eds.) (2010). *Analyser l'activité enseignante: des outils méthodologiques et théoriques pour l'intervention et la formation*. Québec: Presses de l'Université de Laval.

Schwille, J., & Dembélé, M. (2007). *Former des enseignants: politiques et pratiques. Principes de la planification de l'éducation n°84*. Paris: UNESCO.

Serres, G., & Ria, L. (2007). Questionner la formation des enseignants à partir de la description des trajectoires des formés. *Revue des Hautes Ecoles pédagogiques et Institutions assimilées de Suisse Romande et du Tessin*, 6, 99-119.

Sherin, M.G., & Han, S. (2004). Teacher and learning in the context of video club. *Teaching and Teacher Education*, 20, 163-183.

Sherin, M.G. & van Es, E. (2009). Les effets de la participation à un vidéoclub sur la vision professionnelle des enseignants. *Journal of Teacher Education*, 60(1), 20-36.

Smethem, L. (2007). Retention and intention in teaching careers: will the new generation stay? *Teachers and Teaching: Theory and Practice*, 13(5), 465-480.

Tardif, M. (2010). Influences internationales et évolutions de la formation des enseignants dans l'espace francophone. Entretien de Régis Malet. *Recherche et Formation*, 60(1), 105-110.

Theureau, J. (2003). Course-of-action analysis and course-of-action centered design, In E. Hollnagel (Ed.), *Handbook of cognitive task design* (pp. 55-81). Mahwah, NJ: Lawrence Erlbaum Ass.

Theureau, J. (2004). Cours d'action: *méthode élémentaire*. Toulouse: Octarès.

Theureau, J., & Jeffroy, F. (1994). *Ergonomie des situations informatisées: la conception centrée sur le cours d'action des utilisateurs*. Toulouse: Octarès.

Winograd, T., & Florès, F. (1989). *L'intelligence artificielle en question*. Paris: PUF.

serge.leblanc@fde.univ-montp2.fr