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Teachers' perceptions of facilitators and barriers to the implementation of alternated training

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Introduction

The aim of this research is to explore the problems of alternated training implementation according to involved actors' point of view. We try to identify the difficulties but also the successes, the barriers and facilitators to the implementation of pupils and students work experience in two modalities: the internships (student status) and apprenticeship (work contract). These two modalities exist in France to prepare the same diplomas and certifications. The focus is put on the interactions between the three main actors (trainee or apprentice, teachers and professionals) and on the transmission and acquisition of knowledge between them.

These themes have been the subject of empirical studies (Huchette & Thienpont, 2010 - Rhone-Alpes, 2003 - Adigüzel, 2004, Hardy & Menard, 2008) where we can identify questions about:

- Research and preparation of training periods in companies.
- Activities offered to students by companies.
- Pedagogical continuity of training between education and companies.
- Support and follow-up of the trainee during the period in companies.
- Interactions and their instrumentations between actors of alternated training school-company.
- Evaluation and certification of the trainee after the period in companies.
- Capitalization of work experience in companies for teaching.
- Involvement of actors in the system of alternated training.
- Relationships between employment and training periods in companies.
- Role of the tutor of the trainee in companies.
- Role of the referent teacher in the system of alternated training.

We wish to re-examine and complete the results of these empirical studies in light of the connective model (Griffiths & Guile, 2003) and of the results of our interviews of teachers concerned by the implementation of alternated training.

In this communication we focus on what teachers say about the tripartite interactions school-company-pupil/student and their instrumentation.

In particular, we question the relevance of the boundary documents as mediating objects. These boundary documents are considered here as tools to facilitate and optimize the mediation between the three parties in the purpose of defining students activities in the

company and to ensure an effective pedagogical continuity between education environment and work environment. We will see that these documents are often discussed in empirical studies and interviews with teachers under various names (guide, monitoring, schedule, coaching, shuttle, booklet ...) whose main function, sought and not always achieved, is to allow a successful connection between the two environments to accompany the trainee or the apprentice in his work experience.

The pedagogical continuity is understood as an ability to ensure a synergy between the two communities to define the content of the knowledge to be acquired by the student and a progression in its acquisitions in accordance with a training program.

We want to identify concrete problems for the implementation of alternated training, specially with regard to the interactions between the actors: what are the obstacles, what are the levers and what are the principles which guide teacher's actions ?

Scientific and empirical background

Connective model for learning through work experience

We retain the connective model of learning through work experience proposed by Griffiths and Guile from which we present here some aspects that concern our present research (Griffiths & Guile, 2003 and 2004 - Hardy and Menard, 2008).

This model is characterized by a reflective approach for the student by confronting him to all the aspects of a work experience. Referent teachers and tutors associate and collaborate to promote the training of the student by allowing him to make the most of the workplace potential through :

- His interactions with other employees through activities in the company.
- His real participation in solving both technical and organizational problems within communities of practice.
- His reflexivity on implemented processes in the company to solve problems.

The student is supported to make the connections between the formal education developed at school and the informal knowledge acquired through work experience. The connective model requires an efficient management of the student as part of a genuine policy of company training.

For us, this model offers innovative and promising aspects in terms of pedagogical development for the learning of pupil in alternated training and we try to show the characteristics of interactions between the actors in this connective model.

This model addresses learning as a socio-cultural process and a complex act of mediation between the individual (here the apprentice or trainee), the task or activity to be performed and the mediation instruments.. In the case of work experience the person must understand the aim of his activities and the role of mediating objects that will help achieve this activity. The connective model clearly shows the trainee or apprentice in the middle of a training system that promotes the reflexivity in the production of poly-contextual activities. The teacher and the tutor establish together a collaboration to enable the

student through the tasks to accomplish, to open-up and to develop himself at the workplace. The collaborative work between those who supervise the student we seems fundamental for the pedagogical continuity of the training and for the coaching during the internship in the company. In this perspective, border documents as mediator objects are designed to promote all students interactions with the company environment and to enable him to open-up to all the aspects of the activity to accomplish.

We notice that the connective model is designed to ensure a adequacy between the activities assigned in the company and those expected by the teachers according to their interpretation of institutional requirements. The pedagogical continuity is also ensured by this adequacy and the close cooperation between the two environments of education and teaching.

Empirical studies: what about the interactions between students, teachers and tutors?

Three of these empirical studies were conducted in France either by researchers (Huchette and Thienpont, 2010, Adigüzel, 2004) or by a consulting firm (Rhône-Alpes Amnyos Office, 2003). The fourth study was treated by researchers in Canada (Hardy and Menard, 2008). These four empirical studies question teachers, professionals and pupils or students of vocational industrial or tertiary to their own methodologies and suggest areas for the improvement of the system.

The authors have different approaches and questions, but we can see that the interactions between the pupils or students, teachers and tutors in the company are often put forward:

- Either directly as situations that present difficulties in interpersonal relationships in terms of communication, motivation and involvement. The notions of compartmentalization of roles and juxtaposition of learning are advanced.
- Or more indirectly through the gaps between the required or expected activities and the real ones for the training of students and because of the tutor's lack of preparation in his training function.

These difficulties are presented by the teachers among the main causes to the pedagogical breaking-off which is very often observed between the training periods at schools and in companies.

Moreover the same relationships problems are the source of insufficient and too imprecise support and follow-up during the period in companies and students do not always understand the objectives to be reached.

One solution mentioned to fight against these difficulties, one of the levers often proposed, is the development of boundary documents as the mediating objects supposed to facilitate the interactions between the actors and to ensure in this way the pedagogical training continuity while providing the tutor with precise specific elements of his real trainer role.

Assessment concerning those documents, essentially developed by teachers alone, shows inappropriate content that remain largely incomprehensible to the student and to the tutor. These documents are complicated and are rarely relevantly used. In this way,

they do not fulfil the function for which they were planned, that is to say ensuring a real and powerful pedagogical continuity and to efficiently position the trainer role of the tutor.

Our interviews: teachers' perceptions of facilitators and barriers for the implementation of alternated training

Methodology

We conducted 8 semi-structured interviews of 40 to 70 minutes with teachers involved in the implementation of internships or apprenticeships in the workplace at different qualification levels of students and in different specialties of training:

Trainings	Statute	Students' theoretical age	Method of interview
« Section de baccalauréat professionnel, Techniciens du bâtiment ». Secondary education, vocational training of technicians in construction industry.	School statute	17-18 years	Face to face
« Section de techniciens supérieurs (BTS) du bâtiment ». High-level technicians sections in construction industry.	School statute	18-20 years	By phone
« Sections de techniciens supérieurs (BTS) en étude et économie de la construction et en technico-commercial, matériaux du bâtiment ». High-level technicians sections in study and economy of construction industry and in technical-commercial, materials of construction industry.	Apprenticeship	18-20 years	Face to face
« Sections en institut universitaire de technologie (IUT), génie civil ». Specific vocational training (university) in civil engineering.	School statute	18-20 years	Face to face
« Licence professionnelle en travaux publics » University education, 1st graduation in civil engineering.	Apprenticeship	18-21 years	Face to face
« Master en ingénierie du bâtiment ». University education, 2nd graduation in construction engineering industry.	School statute	21-23 years	Face to face
« Ecole d'ingénieurs, 1 ^{ère} année ». Higher engineering school, first year.	School statute	20-21 years	By phone
« Ecole d'ingénieurs, 3 ^{ème} année ». Higher engineering school, third year.	School statute	22-23 years	By phone

The talks guide addresses selected topics: career of the interviewed person, school-company relationships, organization before the internship, follow-up during the internship, evaluation after the internship, evolution of the system and proposals of the interviewed person.

Our analysis is aimed to identify barriers and facilitators of the interactions between actors. Finally we establish links between our analysis of empirical studies and interviews and the connective model for which we endeavor to show the interest that we see to problematize the learning through the work experience.

In the framework of this research, we retain aspects directly related to the interactions between the actors of alternated training. The situated cognition suggests the principle of a social process for the acquisition of knowledge (see for example the synthesis proposed

by Fischer & Boreham, 2004, about work process knowledge) that involves interactions with others in a community of practice. We are here interested in this aspect and in the mediation process both in the workplace and in the training that can help the pupil, the student or apprentice to establish connections between their formal learning at school and their informal learning in the company.

Results

The aim is to bring out from our interviews the perception of teachers on the interactions between the two educational and professional environments

« Section de baccalauréat professionnel, Techniciens du bâtiment » : The breaking-off between the two circles of education and business is very clear. The interviewed teacher thinks that the internship is not really a training period compared to the frame of reference of the degree even if the students acquire some specific skills (especially transverse). Refocusing may be needed for student activities that are outside the areas of the skills of diploma or for inappropriate tasks. The training course cannot replace theoretical learning and the number of hours for this learning in an institution is missing, this is why the theoretical base greatly reduces the opportunities for students to continue their studies. The two environments do not work together and the company is supposed to train young people according to a training frame of reference that is not very well understood : *"Companies coach students but are not trainers, it's not their job ..."* - *"Students don't think enough and they are not enough assailed by requests , I think, in the company ... "*

« Section de techniciens supérieurs (BTS) du bâtiment » : Relationships between the two circles are real and wished by the actors but they are not possible without continuous efforts and some important aspects still have to be improved. Links in student training are not strong enough to ensure a genuine pedagogical continuity between two environments that have their own dilemmas, their contradictions. Tutors are not prepared for a training function *"they forget the documents that are sent to them or they just skim through them, they only remember a couple of things ... not everything in any case, well, it is not clear."* We need more links between training at school and in the company so that learning through work experience would make sense, but at the moment the period in the company is designed out of the theoretical training, it is considered as another time. The interest of border documents between education and company are limited even when the tutors fill them up and they are misunderstood because they are written by experts in pedagogy , theoretically as a model to apply.

« Sections de techniciens supérieurs (BTS) en étude et économie de la construction et en technico-commercial, matériaux du bâtiment » : In the apprenticeship, the training of the young person is shared according to a true partnership between the company and the education center *"if it doesn't work on one side, if we do not properly communicate together, there is no correct training for the young person."* According to the BTS, companies are either completely involved in training or they do not play their training role and give priority to the production function. The activities are not always advisedly proposed despite of the learning booklet that contains a list of the skills to be developed. The booklet *"moderately works, we oblige ourselves to fill it out and see"*, it can track what is happening in the training center and in the company but the pedagogical continuity does not really exist because the education center has constraints of program to follow and the company has imperatives of projects to be undertaken: *"I really see it as two parallel lines*

and from time to time both lines are combined, then they separate again, then they are merged and the most we get towards the end of year, the most merged they are ."

« Sections en institut universitaire de technologie (IUT), génie civil » : The relationships between the two environments are not always satisfying particularly because of a lack of involvement of companies in the training at the workplace. These relationships could be improved by a better listening of the expectations and needs of each circle. The internship can validate the theoretical knowledge provided by university teachers who often do not have a good knowledge of the business world. Drifts come from the commitment of the company that propose activities not complying with the requirements and expectations: "... *companies are not in demand and that is the eternal problem*" or "*The activity in the company is not particularly adapted to training, when you want to do it in a good way you have to devote time for an intern ... it's not a priority for some companies* " and "*I would take a trainee but I do not know what I'm going to make him do.* " The period in the company is mostly considered as a springboard to employment by allowing the student to discover business life instead of a training period in collaboration with the university.

« Licence professionnelle en travaux publics »: The involvement of the companies is strong, "*we regularly question them about the relevance of the educational content regarding the real professional world in which young people are going to be evolving a few months later*" but the exchanges between universities and professionals are too weak , sometimes even in opposition. Bridges have to be built between the two environments in order to learn more about each other and maintain regular relationships. Talks between the academic advisor and tutor are scheduled and "*follow-up documents*" (border documents) are proposed (integration of apprenticeship, assigned tasks, evolution of the tasks, evaluation of the student such as punctuality, openness, initiative ...). Sometimes a few drifts may emerge: misunderstanding of the student concerning the aim of the training or lack of activity, companies who see the system as a supplier of low cost manpower. For the apprenticeship it is sometimes necessary to raise the company's and the student's awareness of the specificities and the objectives of the apprenticeship contract. Efforts have been made but some areas of possible improvement remain, the main one would be to visit the company more frequently when the young apprentice or trainee is there so as to reach a better follow-up: "*we necessarily have to tighten the links between the professional environment on the one hand and the educational environment on the other hand.* "

This gap between expectations and realities of the companies and inadequate academic programs is a major reason for the breaking-off between the periods of training at school and in companies. Another reason is the ignorance of teachers concerning the business world (non-existent or even negative speech). Another reason for this breaking-off is about the trust that is given to the student in the company and because of this he is answerable for stakes that are much more real than at the university.

« Master en ingénierie du bâtiment » : The relationships between education and companies are efficient. The university is the one which solicits out the business world for partnerships where the links must constantly be maintained. This is about seeking the experience and the expertise of partners both for scheduling the instruction as for receiving the students. The network of partner companies is based on repeated and followed interactions between the two worlds of education and business. In this building specialty the expectations of companies are important, and meetings and exchanges between the two parts are numerous.

All along the internship, the university continues listening to the students, and if a problem occurs the academic advisor plays the role of mediator and always talks with the tutor. Proposed activities must match the qualification level of the instruction and should provide continuity in the acquisition of knowledge and skills.

« Ecole d'ingénieurs, 1^{ère} année » : The company plays an important role in the instruction through various relationships with the school which facilitate exchanges between the two environments but must, as part of the training course (understanding a profession) fit to the qualification level of the student and it may happen that the activity proposed to the trainee in the company is inadequate (too repetitive, poorly calibrated, dusting ...) or an unsuitable study subject. Students *"learn something about the relationship to people and that's really a key."*

The training forms part of the pedagogical continuity of the teaching periods at school in particular through the implementation of learned concepts providing a dimension of learning by doing and by taking responsibility.

« Ecole d'ingénieurs, 3^{ème} année » : The school helps and oversees relationships between students and companies but *"the natural tendency of a company would rather be to find a direct operational function to the student and to neglect a little bit the instruction part."* The partnership between the two circles is varied (tours, activities, interventions, conferences, courses ...) but even though interlocutors and relay for common actions can sometimes fail in companies. Mobilization can be difficult: *"I think it's often the problem on both sides, teachers are more focused on education and companies on functional business. Then concerning common actions, the difficulty is to have enough resources surrounding the activity that the numerous students who leave in companies can be adequately followed-up, supervised, trained so it has to be a real education process."* Every student is followed-up by a pair of referent teachers (technical and functional) who intercedes with the student and the tutor in case of drift. The student must be in a challenge situation according to his real abilities and the training must offer a real project to conduct that comes up to the formation potential.

We remind that this analysis concerns only the interviewed teachers' opinion and engaged in the implementation of the alternated training. If all the interviews show the need of efficient interactions between the circles of education and business, we can observe that these perceptions show some differences. Indeed,:

- In high school (Baccalauréat professionnel and BTS), for the vocational trainings studied, formalized expectations of teachers (according to institutional programs of training and their own interpretation of texts) are very present. At university or in engineering schools, these expectations are less strong because, regardless of any national program, these trainings manage the contents of their teaching which the periods in the company.
- The higher the skill level of training is, the more varied are the links between the two environments beyond the single internship and this leads to relationships and exchanges considered more effective even if they are sometimes not numerous enough.

One of the leitmotifs in numerous interviews is about the offered activities to students or apprentices during the period in the company towards the prescribed objectives of the academic training. The most frequent highlights the inadequacy of these activities compared to the expectations of teachers. They may be out of the diploma competences, inadequate to the academic training and to the qualification level or even non-compliant to the prescriptions.

One of the most immediate consequences of these poorly calibrated activities is to generate an pedagogical breaking-off between the academic training and instruction at the workplace that is damaging from the results of the interviews and in our own opinions. In several interviews the period in the company is not considered as a training time for the student and apprentice, but as a juxtaposed experience which certainly brings specific skills without allowing a real synergy between the two environments. Each part retains its own requirements with on the one side a teaching perspective and on the other side a production perspective. It can be noticed that, in this way, teachers do not always recognize the ability of a company to properly educate the student.

One of the areas of improvement put forward with these findings is certainly the tightening of the links between the education center and the company. We can also notice that the multiplicity and variety of the relationships between the two environments are favorable to a better pedagogical continuity of the training. These links can be built by meetings that would allow the actors to know and to understand each other but also by the use of boundary documents between the trainee or apprentice, the teacher and the tutor.

When these varied documents exist they are often called to a limited performance to connect the two training environments of the student. These inadequate documents, and often only designed by teachers, remain poorly understood by the student and by the professional who often neglect them.

The function of the tutor as the person responsible of following up and supporting the trainee or the apprentice during his stay in the company is also approached. We can notice that the involvement and education of the tutors are fundamental to the relationships quality between the two circles.

Conclusions

The analysis of the interviews clearly corroborates the results of the empirical studies retained in the frame of our research. Regarding the obstacles we retain the following ones:

- The tripartite interactions are the seat of relationship difficulties.
- The activities proposed to trainees or apprentices too rarely meet the expectations of the educational environment.
- As a result, the expected pedagogical continuity between the two environments of the student training is rarely achieved.
- The instrumentation of the interactions through boundary documents common to the three parts is inefficient.
- The student is not supported and guided enough during his time in the company.

- The tutor is not aware enough of his trainer role for which he is not prepared enough.

The levers likely to improve these situations directly respond to the difficulties that have been raised :

- Teachers are aware of the importance of involving companies in a true partnership between school and companies in particular to define together the activities to be offered to students.
- The two environments can have, beyond the sole concern of the internship, interests in developing other types of relationships.
- Continuous links can improve the interactions between the two environments.
- The need to re-think differently about the documents used in the tripartite relationships to adapt and make them understandable to everybody.

We also notice that the two circles of school and company co-exist without any real collaboration and the activities for training students are offered without well-defined objectives. In many cases, the company is considered as a place to apply the theoretical knowledge developed at school or as a place to discover the professional world. All this is far away from a common training strategy of student (corresponding to the traditional model described by Griffiths & Guile, 2004).

Nevertheless we can see, in a few interviews, that the collaboration between the two environments is varied and based on a regular partnership that provides an effective support of the student. Meetings between teachers and tutors are followed; the activities are varied and well defined (corresponding to the experiential model described by Griffiths & Guile, 2004).

The connective model is not present in the analyzed studies and interviews of this research. We will try to define, from the barriers and levers of the frame of our research, a line of improvement of the devices that could enable us to reach this model.

In this aim, we propose, following this research, to reflect on the boundary situations between actors of alternated training. We define these situations, which can be as appropriate bipartite or tripartite, as the moments of interaction between the trainee or apprentice, tutor and teacher. We characterize these situations, including by an instrumentation which implements boundary mediation objects between the actors of alternated training. In particular, the boundary documents developed in collaboration between the two environments of school and the company must meet certain specific requirements to define the relationship between work experience (connections between different types of knowledge and skills), learning and knowledge.

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