Synergies between educational science research and teacher training: An illustration of research as supporting training of future primary school teachers

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Abstract
Our contribution highlights the succession of curricular reforms in pre-service teacher education. Indeed, in moving from a three-year diploma course to a Master's degree, the challenge is both to invest research in training curricula and to develop the role of research use among future teachers with a view to improving their practices. After the changes in teacher training are presented, an example of an innovative scheme that combines the results of recent research on effective teaching practices and the transformation of the practices of both trainers and future teachers is given. This innovative system attests to the possibility of collaboration between researchers and teacher trainers, whose expertise can stimulate the appropriation of knowledge from research in improving teaching practices, from initial training onwards.

Keywords
Educational sciences research – teacher training – effective practices – partnership – research place.

Resumé
Notre contribution met en évidence la succession des réformes qu'ont connu les curricula en formation initiale des enseignants. En effet, passant d'une formation diplômante en trois ans vers un master, les enjeux sont à la fois d'investir la recherche dans les curricula de formation et de développer la posture de chercheur chez les futurs enseignants dans une optique d'amélioration de leurs pratiques. Après la présentation de l'évolution de la formation des enseignants, un exemple de dispositif novateur qui allie les résultats des recherches récentes sur les pratiques d'enseignement efficaces et la transformation des pratiques à la fois des formateurs et des futurs enseignants est présenté. Ce dispositif est un témoin de rencontres possibles des acteurs de la recherche et de la formation dont l'expertise respective est réunie pour stimuler l'appropriation des savoirs issus de la recherche dans les pratiques enseignantes dès la formation initiale.

Mots-clés
Recherche en sciences de l'éducation – formation des enseignants – pratiques efficaces – partenariat – place de la recherche.

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Introduction

With changes in the teaching profession and the socio-political context surrounding it, a consensus is emerging on the need to strengthen teacher education to enable teachers to meet the many challenges they face on a daily basis (Fullan, Hill and Crevola, 2006; Lessard and Tardif, 2004). Some of these challenges relate to student learning, which requires teachers to adopt an approach that focuses on innovation and complexity (Lison, Bédard, Beaucher and Trudelle, 2014; Messman and Mulder, 2012). However, current work shows that there are other challenges for teachers, who necessarily join schools (März and Van Nieuwenhoven, 2020). Thus, in addition to teaching the class of which they are the teacher, the teacher must function as a member of a working group, in a micro-political climate and school organization (Coppe and al., 2020; März, Gaikhorst and Van Nieuwenhoven, 2019).

One powerful lever for training professional teachers capable of overcoming the obstacles related to these different dimensions would be to anchor their training more firmly on a research-based approach aimed at improving educational practices (Coburn and Penuel, 2016). Austin (2016) explained that integrating research into teacher education can bring several benefits, such as helping teachers find solutions to particular problems, connecting them with up-to-date sources of information, determining priorities when introducing change, improving their understanding of their professional and political context, and, in sum, improving their effectiveness as teachers.

In terms of "teaching the class", which is the focus of this contribution, knowledge from research in the educational sciences, whether in didactics, psychology, sociology or the humanities in the broadest sense, provides important theoretical support for teachers' critical perspective and thus promotes communication between theory and practice (Paquay, 2012). For example, the Measures of Effective Teaching research thread (Creemers, 1999; Ko, Sammons and Bakkum, 2014; Scheerens, 2008) has made it possible to identify effective practices on which teachers can build. In addition to equipping this reflective perspective, an up-to-date research anchor can support instruction both during planning of instruction and during the learning process, to differentiate and adapt instruction according to student responses.

The aim of this text is to show, on the one hand, how teacher training and research in educational sciences can work in synergy and, on the other hand, the effects of this work. We first present the changes in teacher education in French-speaking Belgium over the last twenty years. The latest reform, which is still under negotiation, suggests a

willingness to strengthen training towards the attainment of a Master's degree and to place knowledge from research in the humanities at the heart of the training process. Second, we describe a teacher training system that has sought to combine training and research in the field of effective teaching practices. Our ambition is to illustrate with a concrete example how education sciences and teacher training can be combined. Third, we pinpoint the effects of the scheme, from the point of view of students and trainers. Fourth, we identify some possible conclusions and pedagogical and research perspectives.

The meanders of initial teacher training curricula in French-speaking Belgium

At present, teacher training for pre-school (3- to 5-year-olds), primary (6- to 12-year-olds) and lower secondary (12- to 15-year-olds) teachers is a 3-year program at Haute Ecole[4], leading to a 3-year baccalaureate certificate. Teacher training for upper secondary school teachers (16- to 18-year-olds) is a 5- or 6-year program at a university (long-type higher education establishment) and leads to a Master's degree in 3 years.

A first reform in 2001

In 2001, the reform of initial teacher training in French-speaking Belgium led to a number of major institutional and organizational changes: the imposition of a reference framework of 13 competencies, new specifications with updated course titles and a reorganization of courses. This reform was based on the "Missions" decree (1997), which set out a competency-based approach for all. On this subject, Frenay and Maroy (2004) wrote that this decree would be the springboard for other legal texts, which would refer to it for further study.

Teacher training was now intended to be more "professionalizing" and aimed to train a teacher who develops a strong professional identity and is capable of adapting to the new challenges of school transformation. The time allocated to internships was significant, covering nearly 500 hours. According to the decree of 2000, internships were defined as "practical teaching activities in real situations" (Decree "formation initiale", 2000, Article 15, p. 5). These courses, which form the basis of initial teacher

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[4] In Belgium, an Haute Ecole is as a group of higher education institutions that provide short or long type education within the Bologna Declaration. Universities only organise long types.

training, are ideal opportunities for experimentation, reflection, commitment to a collective profession, professional self-assertion and personal development.

At the university, the encounter with practice was organized in a progressive manner through observation-based courses and continued with responsibility-taking courses from the second year onwards, covering increasingly longer periods. Thus, the decree of 12 December 2000 (Decree "formation initiale") imposed 2 weeks of internship in the first year, 4 weeks in the second year and 10 weeks in the third year for all sections. In the first year, the student is mainly responsible for observing how the class functions and how learning is managed, and for planning learning sequences by taking charge of one or another activity, while during the second year an integrative type of alternation is set up, which leads the student to move, on several occasions, from the training institute to several places of practice. However, the alternation is not formative as such, it is only the necessary condition for theory-practice communication (Pentecouteau, 2012). Thus, theory is likely to be influenced and questioned by problematizations arising from practical situations (Vanhulle, Merhan and Ronveaux, 2007).

It was within this framework that the legislature introduced, as early as 2001, an innovative scheme called the Vocational Training Workshops (AFP) to forge links between the two training venues: the school and the training institute. Their objective is to place theory and practice in a relationship of reciprocal functionality: theory serves to elaborate and regulate teaching processes, while practice serves to contextualize, test and reorganize theoretical content, in the context of the development of professional skills. These workshops are co-facilitated by specialists in didactics, educational psychologists and new partners, namely, Masters of Practical Training (MFP). These are professionals from the field who are present at the teacher training institution to contribute their field-based expertise.

According to the official text, the central objective of AFPs is "to experiment, observe and analyse the different components of the profession. They integrate disciplinary and general didactics within the framework of activities organized both in the field and at the university" (Decree "formation initiale", 2000, Article 10, p. 4). In concrete terms, even if AFPs constitute a privileged place of integration, and even if the concrete aspects of the profession are addressed there, they cannot sufficiently develop in the student the reflective posture necessary to respond to the complexity of professional tasks and situations (Van Nieuwenhoven, Dejemeppe and Coupremanne,

2012). This is why the systems that support internships also have an essential role in supporting the development of a reflective posture in students to enable them to adapt their actions to the changing and difficult contexts they encounter in the field (Paquay and Nitonde, 2011). Together, AFPs and internships cover nearly one third of teacher training.

Higher education "landscape" reform in 2013

In 2013 (Decree "Paysage", 2013), a decree defining the landscape of higher education and the academic organization of studies was issued by Minister Marcourt. This decree aimed to focus training on the student's career path and to guarantee the coherence of higher education through the creation of the Academy of Research and Higher Education (ARES), as the sole steering body. This academy is a space for consultation and coordination between the higher education institutions of the Wallonia-Brussels Federation. Its role is to ensure the coherence of the course offerings and content by supporting the institutions and ensuring overall coordination while encouraging collaboration.

According to section 121, the academic authorities of the higher education institution establish the teaching profiles, programs and detailed timetables of learning activities, grouped in teaching units (EU), of their institution's authorized courses of study, taking into account the minimum curriculum established and the competency framework (FWB, 7 November 2013).

Towards longer studies

Several factors such as the very high number of pupils with difficulties at school, the heterogeneity of classes, the question of educational inequalities, the place that teachers can take in their organization, but also the difficulty of attracting a public motivated to become involved and persevere in the profession, once again call into question initial teacher training. In the current context of increasing demands on teachers and the inability of the education system to support the success of all pupils, teacher training is once again being called into question.

However, the issue of teacher training was not on the political agenda until the Government's Community Policy Declaration (CPD) for the 2009-2014 legislature. The aim was to contribute to the revaluation of the teaching profession and better mastery of

subjects and methods through more advanced training (Projet de Déclaration de politique communautaire 2009-2014, 2009). With this in mind, the Minister in charge of Higher Education of the Wallonia-Brussels Federation initiated a process of reflection, the first steps towards possible lengthening of initial teacher training (Nicaise, Bodson and Naif, 2011). The notion of extending training is not new, however; as early as 1990, Professor de Landsheere's report, initiated at the request of the Minister of Education and Scientific Research, proposed unified teacher training, organized at the university and in partnership with the universities (Beckers, 1999).

Participatory, qualitative and evaluative evaluation

A participatory and qualitative evaluation of teacher training was carried out by the Centre d'études sociologiques des Facultés universitaires Saint-Louis (Degraef, Mertens, Rodriguez, Franssen and Van Campenhoudt, 2012), based on interviews of various actors in education. This survey revealed a certain number of fears regarding the extension of training, expressed by actors at Haute Ecole (HE) and universities. These fears concerned the status of trainers in higher education, the requirement of a doctorate for all trainers, "uniformisation under the pretext of harmonisation" between the two training institutions (HE and University), and a transition to five years without "in-depth reflection on the aims, obeying a political logic of minimal compromise" (Degraef et al., 2012, p. 40).

The study also revealed a gap between HE and universities in terms of perceptions of training offers: "In order to stand out from HE, [university professors] put the whole package on university knowledge, there is no individualized supervision" (Degraef et al., 2012, p. 44), unlike the Haute Ecole, whose professionalization dimension is pointed out as being "its real trademark" (Degraef et al., 2012, p. 45). For some, the distinction can also be seen at the level of the students, who do not have the same profile. Hence the question: "Are universities capable of supporting students' professional projects that need to mature?" (Degraef et al., 2012, p. 44). Moreover, this "overhaul should be organised in collaboration with the different types of institutions, taking care to make the most of the skills recognised by each of them" (Degraef et al., 2012, p. 69).

Establishment of working groups

Two working groups were set up: the first brings together various players in compulsory and higher education (trainers, organizing authorities, trade unions, students, ARES, and so forth) and was given the task of giving an opinion at each stage of reflection, and the second brings together representatives of the four types of higher education training institutions (Universities, Haute Ecole, Schools of Arts and Social Promotion Education) and was given the task of "providing a reform project" (Demeuse, Derobertmasure and Bocquillon, 2018).

A decree defining initial teacher training (2019) was finally passed by the FWB Parliament on 7 February 2019.

This decree provides for training with which all teachers in compulsory education (with the exception of teachers of technical courses and professional practice) will graduate jointly from universities and colleges (and/or art colleges), starting in September 2020[5]. The changes introduced by the decree are multiple (initial diagnostic test of French proficiency, 60-credit specialization Master's degree allowing access to postgraduate studies, probable salary increase, and so forth).

An extension to four years is set for pre-school, primary, and lower secondary school teachers (sections 1-3), leading to a 60-credit Master's degree (a 180-credit Bachelor's degree followed by a 60-credit Master's). Most of this training will be organized by the HE: 180 credits will be paid for by the HE and 60 credits by universities. Nevertheless, both institutions will be involved in both the first cycle (150 credits through the HE, 30 credits through the university) and the second cycle (30 credits through the HE, 30 credits through the university).

For teachers in upper secondary education (section 4), the decree provides for "direct" and "deferred" training (Décret définissant la formation initiale des enseignants, 2019, art. 3), both of which are mainly organized by universities. The "direct" training, a 120-credit Master's degree, will allow the integration of teaching apprenticeships from the very beginning, with progressive inclusion of HE in the curriculum: 30 credits out of the 180 in the first cycle, and 30 credits out of the 120 in the second cycle. The deferred training, known as "agrégation", will consist of a 60-credit Master's degree (50

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[5] At present, the reform has been postponed for at least one year and is the subject of an analysis of its relevance and the financial resources committed in the short and long term.

credits to be paid for by the university and 10 by the HE). It is intended for students who have obtained a Master's degree with an in-depth orientation, but who wish to eventually engage in teaching. This additional training is therefore focused on the pedagogical and didactic aspects of the profession.

In addition, the curriculum for the four sections is redefined according to 6 training axes (Decree, 2019, art. 14, p.7): disciplinary training, didactic and pedagogical training, training in human and social sciences, communications training, training in and through practice and training in and through research. Internships are to remain the major component of training, in close articulation with the other training axes and supported by a reflective approach for students. Two other priorities are also highlighted by this decree: in-depth training in the humanities, which could provide a framework for analysis to support students' reflective distance from the professional situations they encounter, and training that is truly linked to educational research, through the completion of a thesis, among other things, but also through involvement in research. Trainers from universities and colleges would have to co-define a body of key knowledge (knowledge base) to be acquired in depth by students throughout their training (Paquay, 2012).

"Universitarization" of teacher education

Following in the footsteps of other countries (Canada, France), Belgium is therefore witnessing the phenomenon of the "universitarization" (Bourdoncle, 2007) of its teacher training, which aims to extend university training to all teachers. This process affects three aspects: (1) the training institutions, which are thereby transformed in their structures and modes of operation, (2) professional knowledge, in which research plays a predominant role, and (3) the training staff themselves, who are "confronted with a new dominant status, that of teacher-researcher" (Bourdoncle, 2007, p. 138). In many countries that have opted for this option, universitarization is seen as a means of enabling "professionalization through an improvement in the status of teachers and the anchoring of practices on scientifically validated reference knowledge" (Beckers, 2007, p. 17). This new knowledge is supposed to increase teachers' understanding of educational phenomena and, consequently, more effective actions.

In Quebec, Lessard and D'Arisso (2010) also justified universitarization as contributing to the development of a scientific knowledge base. However, other authors

(Fanghanel, 2004; Tardif and Zourhlal, 2005) have identified a tension among those involved in training, who are divided between research and teaching practice according to their initial identity anchored at the university or in the training field.

On the other hand, some authors warned against a succession of reforms that can lead to various feelings among actors: feelings of vulnerability (Kelchtermans and Ballet, 2002) and loss of meaning and legitimacy (Perez-Roux, 2012). Moreover, this new reform requires collaboration between groups of trainers with very different anchors and priorities. This collaboration, although important, sometimes proves to be complex in view of the divergences between groups of actors (Lessard and Zourhlal, 2005), and can lead to tension between research and professionalism (Fanghanel, 2004; Malet, 2009; Tardif and Zourhlal, 2005) and induce actors to deploy strategies to find meaning in their actions (Perez-Roux, 2012; Perez-Roux and Maleyrot, 2015).

It is within this perspective of moving towards a longer training period, with the integration of educational sciences in teacher training, that the scheme proposed below was put in place. After its explanation, we present some methodological aspects that enabled us to gather information from students and trainers, with the aim of revealing some of the effects of this project. This is a first for the training institute.

An example to illustrate the possible synergies between educational science research and teacher training

The training program was set up in collaboration with trainers from Haute Ecole to promote and support the transfer of the content learned about in courses to teaching practices. The training program took place in the final year of Primary school teachers training. It was part of the course called "Study of the main pedagogical trends" and involved about thirty students. The research that was used came from a collaborative research group, and had the objective of drawing up an inventory of primary school teachers' views regarding effective teacher practices in French-speaking Belgium.

Figure 1 shows the different steps involved, which included interactions around research-based knowledge, detailed below. First, knowledge was developed at the university, in the context of a Master's thesis. Second, this (and other) knowledge was shared between researchers and teacher trainers through a study day. Third, the research results were presented and used in a teacher training course. Fourth, trainers requested that student teachers use this knowledge in internships.

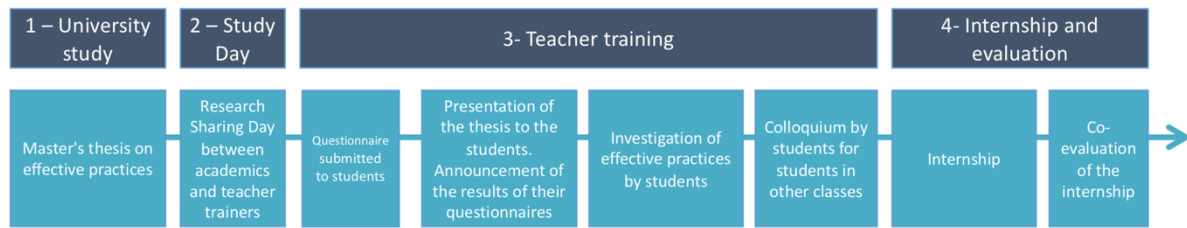| 1 – University study	2 – Study Day	3- Teacher training				4- Internship and evaluation	
Master's thesis on effective practices	Research Sharing Day between academics and teacher trainers	Questionnaire submitted to students	Presentation of the thesis to the students. Announcement of the results of their questionnaires	Investigation of effective practices by students	Colloquium by students for students in other classes	Internship	Co-evaluation of the internship

Figure 1 - Steps in the illustrative example

Thus, first, a Master's thesis was carried out by a researcher as part of their training in educational sciences. The thesis was more broadly part of a collaborative research project. The research group is interested in effective practices for developing oral skills at school (Colognesi and Dolz, 2017; Colognesi and Hanin, 2020; Colognesi Vassart, Blondeau and Coertjens, 2020). The aim of the Master's thesis was to take stock of the practices of Belgian primary school teachers. The theoretical framework supporting the study is that of effective teaching practices (Ko et al., 2014). The study was conducted using mixed methods. A 51-item questionnaire, adapted from Fagnant and Burton (2009), was administered to 180 primary school teachers to identify the most and least effective practices implemented in the classroom. This was done to identify which effective practices the teachers said they could easily implement. The survey also made it possible to identify the effective practices that are least used by teachers. Focus group interviews were also conducted to get a comprehensive view of the results of the questionnaires, for both novice and senior teachers.

Second, a study day was organized. Its aim was to share the latest research results in the different areas related to research groups working on teacher education. Indeed, several collaborative research groups exist in our faculty. Each one is interested in issues related to teacher training: internship support, professional integration, teaching practices. These different groups allow researchers and teacher trainers to collaborate on issues that concern them. This is also due to the fact that teachers are considered experts in data analysis as well (Giddens, 1987; Schön, 1983). Several workshops were organized, including a workshop in which the results of the Master's thesis on effective practices were presented. Several teacher trainers participated, and were familiarized with the data collection tools and the results of the study. The effective practices that teachers rarely use were highlighted. Explanations for this phenomenon were presented, notably with the use of verbatim reports from focus

groups. Afterwards, several trainers asked the researchers to continue these interactions and to intervene in the teacher training program. These trainers teach in the final year of training.

Third, following this request, the researcher who completed their Master's thesis collaborated with teacher trainers by taking part in the training module "Study of the main pedagogical trends".

This involved several steps. First, students completed the same questionnaire used in the researcher's study, which addresses the various effective teaching practices from the literature. Several items deal with the same practice. For each item, student teachers were asked to indicate how often they plan to implement the effective practice explained by the item. A Likert scale was used, ranging from 1 (never) to 5 (daily). Then, the researcher made a 2-hour visit to the course with student teachers. The students were given a presentation on effective teaching practices identified in the scientific literature, including research findings on effective practices that teachers use a little and a lot. Practices that teachers find easy and difficult to implement were also identified. The researcher also presented the results of the questionnaire completed by the students.

Following these presentations, the student teachers worked on effective practices. The practices worked on were: clarification of learning objectives and expectations, using metacognition, teacher feedback, involvement of students in the assessment process, adaptation of interventions according to student profiles, use of existing teaching materials and implementation of strategic teaching.

Students formed groups of four, and the effective practices were divided among the groups. Each group investigated one effective practice by doing additional reading and analyzing textbooks. The students also analyzed their lesson plans. They looked for evidence of use of the practice they were working on. Each group made a synthesis of the elements found. These syntheses were uploaded to a website and could be consulted by the other students. All of this work took 24 hours.

After this work, the students shared their thoughts on effective teaching practices during the course. They discussed what they thought was easy to implement, and what they thought was more complicated. They discussed how to implement them in their internships. Particular attention was paid to the most complex practices identified in the study: teaching metacognitive strategies, providing regular feedback, involving students in evaluation, and adapting interventions according to learner

profiles (these profiles have been conceptualized by Colognesi and Gouin, 2020). These four practices are the ones that teachers said they enacted less often, considering these to be exceptional practices, complex to implement. This has been found for metacognition in other studies (Depaepe, DeCorte and Verschaffel, 2010, 2015; Vlassis, Mancuso and Poncelet, 2014). In another context, that of the teaching of writing, it has been shown that what are called effective practices are not easily implemented by teachers (Rietdijk, Janssen, Van Weijen, Van den Bergh and Rijlaarsdam, 2017).

A colloquium was held in the teacher training institution. The different groups presented the results of their work to the other students of the institution. The contents of the colloquium could be reused in the courses of the students and trainers who participated, in particular, in the course on psychology of learning.

Lastly, student teachers were instructed to implement effective practices in their internship, and this was co-evaluated during the internship assessment.

What is the opinion of the participants in the training program?

Beyond presenting the training program, we wanted to know what the participants thought. Therefore, we conducted semi-structured interviews with four randomly selected students and the two teacher trainers. The interviews lasted an average of 50 minutes each. They were transcribed in full. Content analysis (Miles and Huberman, 1994) was applied to the data collected. An open-ended model with induced categories was chosen.

Several observations emerged from this analysis. They concerned the links with research for the participants, the place of the researcher in the system, the impact of the training program on the participants and the conditions for setting up collaboration between the educational science research teams and the players at the HE.

Participants' links to research

First of all, students reported that they had limited access to research results during their training. They also indicated that they had never had the opportunity to have contact with a researcher before. Curiously, they did not seem to recognize that some of their trainers are researchers as well.

> *It's pretty rare to get research results. Of course, we hear about it. It's rare to actually see an article or a person. But we are told about some research. (Student 3)*
>
> *We never had researchers in class. (Student 1)*

This aspect was confirmed by the trainers themselves. They explained that they find it too complex or that they do not have the time to read recent research.

> *Sometimes when we read research, and I must admit that I read less and less because we don't have that much time, but sometimes it's so complex that I don't always know how to present it to the students. (Trainer 1)*

The researcher's place in the training program

The researcher's participation led to a series of spontaneous reflections among the participants. The students mentioned the importance of the collaboration between the Haute Ecole and the university as helping them to obtain a better understanding of the profession.

> *I really liked that the university came to the aid of the Haute Ecole, especially for teachers still in training. It allowed us to enrich our knowledge of effective practices. (Student 1)*
>
> *I like the idea that it's a bridge between university and college, to see what the university can do for us in our studies. When we are told that we are going to be presented with research or a dissertation, we are afraid that it will be very theoretical. In the end, we quickly saw that we could make the link with our practice and know that it would be useful to us. (Student 2)*

The trainers interviewed also mentioned this opportunity. They indicated their interest in having the collaboration "stay up to date" and allowing the training content to be as up-to-date as possible.

> *I think it's really important for researchers to be able to come here or for us to be able to participate, for example, in the presentation of theses or to contribute to certain research. That's key for me, otherwise we stay in a vacuum and we always say the same thing without being sure that it's entirely appropriate. (...) Sometimes we let ourselves be influenced a little bit by fads without being sure that it's completely effective. Or we prefer a particular approach. (...) My*

concern, each time, is to stay in tune with what research tells us in the field. (Trainer 1)

It is not always easy to understand all the elements of some research, especially when it is in English, while thinking about the pedagogical device. (Trainer 2)

One trainer explained that she wanted to integrate the research aspect into her course to give scientific validity to the content provided.

Last year, I started from "and later, in my class, how do I see myself implementing the learning and managing the group". I had found student work interesting but not very research-oriented. There were fashionable effects, and I wanted to incorporate a critical eye and scientific validity. That's why I told myself that I also had to integrate elements from the research. (Trainer 1)

In this sense, both trainers and students recognized the researcher's skills in mastering specific content that can be shared with them, so that they can answer their questions in a more focused way. The researcher can also establish direct links with the data they have analyzed.

I don't know if our teacher would have been able to contribute so much. She didn't do the research, so we would have had her interpretation; we could ask the researcher more advanced questions and be more certain of the answers. (Student 2)

It's enriching, because it brings an external side and scientific and theoretical support other than our teachers, who sometimes talk about their practice as former teachers. Having an external person to come and show that there is research, I think that's good and that's missing. We know there is research, but we don't get enough of it. There are a lot of things that we find good because we've been taught about them, but I find that there's a lack of real research, "That's good because we've demonstrated that". So it was rewarding to have that. (Student 3)

In the interviews, it also emerged that the presence of the researcher and the entire training program allowed the student teachers to see what the research was all about. Some students mentioned that it is important for the teaching profession.

It's interesting that researchers come to class to see what it is and to include us in this research as well. It's super beneficial for future teachers to see what research is. I think it's important for student teachers to see what it's like and to

meet people from the universities. We're used to this kind of environment. (Student 4)

The impact of the training program on the participants

The training program combining research and teacher training seems to have had an impact, in the opinion of the participants. The first development mentioned was a more sustained implementation of the various effective practices addressed in their courses.

> *I really noticed a change in the two training courses that followed (...) even more in the practices that we analyzed with our group. (Student 1)*
>
> *Yes, frankly, at the second placement I was in special education, the contact with the students was very different. The interaction with them, you had to know your students. I made the link with effective practices, knowing your students well, and I went back and reread a few tips from what we had produced for the project. (Student 2)*

The second result was related to reflective analysis. The students explained that the questionnaire provided by the researcher was an encouragement to question themselves, directly related to their profession.

> *It allowed us to take the temperature a bit, to see how effective we are as teachers. It allowed us to identify our strengths, our weaknesses, our goals. It put words to what we talk about in general. We had a broader vision of all these facets of the profession. (Student 1)*

They also reported that effective practices that had been worked on became benchmarks for reviewing their internship practices.

> *When I reread the effective practices for my internship and the analysis of lesson plans, I realized that there were aspects that were quite clear to me. I used them quite often in the end. And then there were others where I did not realize that at all, or very little. (Student 3)*
>
> *I think the change that's happened is that I've been thinking more. I took the effective practices and I was trying to find the practices in my lesson plans. So for my second internship, it allowed me to think about what I usually lacked. It's a change, because we had a list of practices... (Student 3)*

This was also used in the co-evaluation of internships.

> *I asked them to take into account what we had seen together and in co-evaluation, they had to illustrate one or the other facet by presenting... They had to present the lesson plan and justify their choices by putting post-it notes. They had to improve their lesson plans with effective practices. The co-evaluation time was interesting... in the idea that there was at least one theoretical-practical link, I thought that this was a promising experience for them. (Trainer 1)*

Interviews with the trainers also revealed effects on their own reflexivity. They said that having access to research results also prompted them to reread their teaching practices with this filter of effective practices.

> *Moreover, after the scheme, I assessed myself against the various effective practices. (Trainer 1)*

> *We tend to teach it to students because they have to do it in class, but am I really doing it properly? It mostly leads me to see if I have effective practices and what I could do to make them more effective. (Trainer 2)*

The third impact was related to the research itself. Three of the four students interviewed indicated that they plan to do research themselves after their teacher training.

> *When you see that it can really be used by teachers in training, that I felt more competent afterwards, it would really encourage me to know that there's a project like that at the end of the day and to know that I can really help other researchers for purposes like that. (Student 1)*

> *It makes me want to and I always told myself that I wanted to look for, to go deeper into a subject. (Student 3)*

This research interest shown by the students was viewed positively by the trainers as a potential lever for development and collaboration between researchers and trainers, and also teachers.

> *If they could learn this approach to research, it would be bingo for students because they will become teacher-researchers who will not stupidly pick up a book and photocopy the pages. They're going to have an interesting reflective analysis. That's the first thing that's interesting to me. (...) It also gives the research community the opportunity to have a whole series of teachers that we can count on. Because usually they are afraid to get involved in research...*

> *Whereas if it's normal, we'll have teachers who will get involved in research and give the opinions of actors in the field. (Trainer2).*

*The conditions for setting up a collaboration between researchers in educational sciences and teacher trainers/students at the H*E

For such a partnership project to take place, two aspects seemed important to the participants. First, the very theme of the research appeared to be fundamental. For example, the fact that a researcher came to present what teachers do (or do not do) seems to have been a crucial element in getting participants to hold on to the subject and engage in learning.

> *Seeing the researcher come like that and it's concrete and in the teachers' classrooms, I find it super interesting. Especially since our class, we're the future teachers. Everything we are taught today will have an impact on what we will teach next and on the way we teach. (Student 4)*
>
> *And it was a model that was still accessible. It seemed clear and operational enough for teachers. (Student 1)*

Second, from the trainers' point of view, the researcher must be present, not only to come and share their study, but also to remain present in some way during the training program. Thus, that he or she can also support students at different times, be present during student presentations, or answer trainers' questions afterwards seems essential.

> *The fact that the researcher was able to share his dissertation, and that he was available to come and present, it really motivated me to get involved in the project. I really appreciated that he was able to come and see the presentation of the project. It wasn't a "one shot", I come and then it's over. (Trainer 1)*

Discussion and conclusion

In this text, we have sought to trace the development of initial teacher training programs as reforms with the ultimate aim of improving the learning of all pupils. In French-speaking Belgium, policies now seem to be based on requiring longer studies and a Master's degree in teacher training. This is to enable research, in particular, to be at the source of the systems on which the curricula are based. In other words, the aim is to train reflective practitioners, but also, and hence, research-based practitioners (Paquay, 2012). The undertaking is therefore to aim for better quality training, through training in

and through research, (Austin, 2016; Coburn and Penuel, 2016), and thus to send teachers into the field who are better prepared to overcome the complex challenges of the profession, both in the classroom and more generally at school level (Fullan et al., 2006; Lessard and Tardif, 2004).

The experience we reported here has shown interesting effects, relative to the participants we interviewed. This small sample can by no means allow us to generalize our results, but it offers some food for thought and opens up some positive and reassuring perspectives.

First, it seems that research is, for the time being, very much absent from training curricula, both in teaching and in the minds of some trainers who do not feel competent in the area of research. There is a real challenge here, at the very least to update the content of training courses in line with recent research in the field. But another challenge would be to forge links between training and research with a view to mutual enrichment. Trainers would be in the best position to read and interpret research data on their students' learning strategies. This view, coupled with that of researchers, would allow fine communication between the practical knowledge of some and the theoretical and methodological knowledge of others. This would largely pave the way for collaborative research, which still needs to be recognized as a lever for the production of new knowledge and the professional development of the actors involved (Bourassa, Bélair and Chevalier, 2007; Van Nieuwenhoven and Colognesi, 2015).

Second, it seems that this knowledge from educational research can really take its place in teacher training. In our case, the tools of the study (questionnaire and data collected) and the underlying theoretical frameworks were used in the course "Study of the main pedagogical trends". This provided the students with up-to-date knowledge to plan and analyze their own practicum interventions. In addition, the trainers were also able to revisit their devices to students with this filter, from an isomorphism perspective (Meirieu, 2005; Robinet and Voz, 2014). In order to enable research to make this contribution in the field of training, the choice of subject seems essential since it directly affects the students' interests and it enables the research to be anchored in their practices as early as the internships. The modalities of interaction with the researcher are also important in order to change the students' perceptions of the often inaccessible nature of research and the exclusivity of universities in the field.

What remains to be done now, which is certainly an additional challenge, is to get future teachers, and hence their trainers, to adopt the posture of researcher, as linked

with the other postures they can assume (Colognesi, Van Nieuwenhoven, Runtz-Christan, Lebel and Bélair, 2019; Colognesi, Deschepper, Balleux and März, 2019; Paquay, 2012).

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