Pre-service Teachers' Conceptions on Explicit, Socioconstructivist and Transmissive Approaches to Teaching and Learning in French-speaking Belgium

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Building upon Wanlin and Crahay this research aims at identifying the conceptions of pre-service teachers on transmissive, socioconstructivist and explicit approaches. While Wanlin and Crahay designed a questionnaire measuring the extent to which pre-service teachers embraced the transmissive and/or socioconstructivist approach, we hypothesise that explicit teaching is a distinct dimension of the model that needs to be apprehended by specific items and that may be embraced by some pre-service teachers. We designed a questionnaire including these new items on explicit teaching in addition to Wanlin and Crahay's items and administered it to 563 pre-service primary and secondary teachers in six training institutions in French-speaking Belgium. Our results do not support our starting hypothesis. Further focusing on transmissive and socioconstructivist conceptions in our respondents, our analyses show that the socioconstructivist conception is widely shared but do not systematically oppose a transmissive conception. We found evidence of effects related to institution, year of study and type of training on these conceptions.

Introduction

Finding its origin in the birth of the new pedagogy at the end of the 19th century and during the 20th century, a debate on pedagogical approaches has animated the educational scene, both in French and English-speaking countries. By way of example, the book *Constructivist Instruction: Success or Failure* edited by Tobias and Duffy (2009), which gives the floor to (socio)constructivist and instructionist authors, gives a good account of this debate. This book was published following a symposium of the American Educational Research Association (AERA), itself organised as a follow-up to the controversial paper by Kirschner, Sweller and Clark (2006). The latter, supported by empirical research findings, has been the subject of several responses from more (socio)constructivist authors (Hmelo-Silver, Duncan & Chinn, 2007; Kuhn, 2007; Schmidt, Loyens, Gog & Paas, 2007) to which the authors of the original text have again responded (Sweller, Kirschner & Clark, 2007). In the French-speaking world, we can cite the example of the text written by Paquay (2007) in response to that of Gauthier, Bissonnette and Richard (2007), which aimed at disseminating research results highlighting the effectiveness of instructional approaches.

Generally speaking, authors of instructionist orientation highlight, on the basis of experimental research comparing the effectiveness of various pedagogical approaches on student learning, the greater effectiveness of instructionist approaches such as explicit teaching compared to socioconstructivist approaches (see Kirschner, Sweller & Clark, 2006; Bissonnette et al., 2010). Moreover, these authors also base their argument on research in cognitive psychology that shows that instructionist approaches respect the cognitive load of learners, unlike socioconstructivist approaches (Sweller, Kirschner & Clark, 2007). For their part, other authors question these research findings and promote socioconstructivist approaches (e.g. Herman & Gomez, 2009; Schwartz, Lindgren, & Lewis, 2009), relying more on rhetoric than on empirical research (Tobias, 2009).

The aim of this study is to examine the extent to which future teachers in different training institutions in French-speaking Belgium adhere to one and/or the other pedagogical approach. Indeed, a study conducted in Switzerland by Wanlin and Crahay (2015), based on a questionnaire on the socioconstructivist and

transmissive approaches administered to 228 future teachers, showed that the conceptions of future teachers are less divided than the pedagogical discourse opposing the socioconstructivist and transmissive approaches. For example, some future teachers are in favour of the transmissive approach but are not opposed to the socioconstructivist approach.

Nevertheless, the questionnaire proposed by Wanlin and Crahay (2015) does not differentiate between the transmissive and the explicit approach. However, a careful reading of the debate on pedagogical approaches shows that explicit teaching, an instructionist approach whose effectiveness has been demonstrated by empirical research, is frequently confused with the transmissive approach. This article therefore aims to measure the adherence of future teachers to three pedagogical approaches: the socioconstructivist approach, the explicit approach and the transmissive approach.

Literature review

Socioconstructivist, transmissive and explicit approaches
While socioconstructivist and instructionist writers agree on how the student learns (the learning process), they do not agree on how this learning (the teaching process) can be promoted: "Constructivism has long been recognised as a useful theory of learning in which learners build mental representations by engaging in appropriate kinds of active cognitive processing during learning. It is tempting to also view constructivism as a prescription for instruction in which learners must be behaviourally active during learning. While accepting constructivism as a theory of learning, this chapter examines what is wrong with this view of constructivism as a prescription for instruction" (Mayer, 2009, p. 184).

The socioconstructivist teaching approach refers to different approaches such as problem-based learning, project-based pedagogy, discovery and inquiry learning (Hmelo-Silver, Duncan & Chinn, 2007; Tobias & Duffy, 2009; Wise & O'Neill, 2009). Generally speaking, socioconstructivist approaches are characterised by the use, at the beginning of learning, of authentic and complex tasks during which the teacher plays the role of facilitator (Bissonnette et al., 2010; Gauthier, Bissonnette & Richard, 2009; Stordeur, 2012).

The socioconstructivist approach focuses on the student's rhythm and preferences (Bissonnette et al., 2010).

The definition of the socioconstructivist approach used in this study is similar to that used by Wanlin and Crahay to construct the items in their questionnaire: "The items representing socio-constructivism revolve around the idea that students can find the procedures for solving many problems alone and without the help of an adult, but also that this identification of solutions can be group-based and takes place even before the teacher shows the problem-solving procedures" (Wanlin & Crahay, 2015, p. 261).

In contrast to the study by Wanlin and Crahay, a difference is established in this study between the explicit and the transmissive approach. Wanlin and Crahay's definition of the transmissive approach refers, without distinguishing between them, to the transmissive approach and the explicit approaches as they will be defined in the rest of the text: "[W]e have items that emphasise the need for teachers to explain, demonstrate and present content, and to communicate the steps to follow in order to solve problems. These items, which also include the need for exercise and application, correspond [...] to the ideas of proponents of transmission" (Wanlin & Crahay, 2015, p. 261).

While this definition by Wanlin and Crahay can be associated with the explicit and transmissive approaches, this study distinguishes between these. The explicit approach refers to a systematic teaching approach proceeding from the simple to the complex and including three indispensable steps (Gauthier, Bissonnette & Richard, 2013): (1) the teacher clearly demonstrates the procedures for performing the proposed tasks (modelling); (2) students practise the task with other students and with the teacher (guided practice); and (3) the student performs the task alone (independent practice). Moreover, during an explicit teaching lesson, the teacher constantly checks students' understanding and provides them with a lot of feedback. The transmissive approach, on the other hand, refers to an approach in which the teacher exposes the contents to the pupils, who then apply them alone in exercises. In a transmissive lesson, there is no guided practice phase or verification of comprehension, and feedback is usually done at the end of the lesson (Gauthier, Bissonnette & Richard, 2013).

Teachers' conceptions and the influence of teacher training
There are many synonyms for the term "conceptions": opinions, values, beliefs, etc. (Pajares, 1992). Vause (2009) defines conceptions as preconceived ideas, theories drawn from various sources, generalisations from personal experience that enable the teacher to act and justify their action(s).

Conceptions are not directly observable or measurable and therefore must be inferred from what people say or do (Pajares, 1992). This justifies our questionnaire method for identifying future teachers' conceptions.

Sometimes the conceptions of future teachers are not harmonious and are even contradictory. Nevertheless, they can coexist because their use will depend on the situation in which the future teacher finds him/herself (Mortimer, 1995, cited in: Deaudelin et al., 2005). One could therefore have future teachers who have socioconstructivist and transmissive conceptions, although these are often opposed in the literature (Wanlin & Crahay, 2015).

Although pre-service teacher education is intended to change future teachers' conceptions (Cole & Knowles, 1993, cited in: Nettle, 1998), some research has shown that it is ineffective in changing these conceptions.

For example, Olson (1993, cited in: Boraita & Crahay, 2013) found a status quo in the teaching conceptions of two future elementary teachers in Ontario, Canada. Hoy and Rees (1977, cited in: Boraita & Crahay, 2013) found a change in conceptions as a result of the theoretical courses followed by pre-service American secondary school teachers, but their first practicum resulted in a return to teacher-centred conceptions. The same is true of Doudin and his colleagues (2001, cited in: Boraita & Crahay, 2013) in Quebec, where, after the practicum, future elementary teachers have less socioconstructivist conceptions.

In fact, for there to be a change in conceptions, the future teacher must be in a situation of inconsistency (Pajares, 1992), which is rarely the case during pre-service training since the future teacher is in a familiar situation. Future teachers are not devoid of conceptions about teaching when they begin their training, since they have been in the classroom all their lives.

Yet other research indicates the opposite. In the United States, Bolin (1990, cited in: Boraita & Crahay, 2013) notes a shift in conceptions

of transmission to a process in which the student is active with a future primary school teacher. This is also the case for Markel (1995, cited in: Boraita & Crahay, 2013) with five future primary school teachers in Arizona and for Daguzon and Goigoux (2007) with 15 future French teachers.

What is the situation in the Wallonia-Brussels Federation? In French--speaking Belgium, pre-service primary and lower secondary (ISCED 1 and 2) teachers are trained for three years (180 credits) in tertiary institutions called **hautes écoles** by specialists of education who can embrace different approaches to teaching and learning. The idea of pedagogical freedom is indeed strongly supported: each teacher, as a "reflective practitioner" (Schon, 1984), is free to embrace his/her own approach to teaching and learning. Furthermore, teacher education aims at changing pre-service teachers' conceptions of teaching and learning, as it is often said that students arrive there with a transmissive preconception. Following Nettle (1998), we hypothesise that pre-service education has an effect on changing pre-service teachers' conceptions. We also hypothesise that different *hautes écoles* may have different effects, as their teacher trainers may embrace different approaches and pass them on to their students. Moreover, pre-service upper secondary (ISCED 3) teachers are trained part-time at the university for one year (called **agrégation**) after they have completed their subject training or while in the completion of it. We hypothesise that these differences in pre-service teacher training imply differences in the conceptions of these pre-service teachers.

Measuring teachers' conceptions

The tool constructed by Wanlin and Crahay (2015) makes it possible to identify socioconstructivist and transmissive teacher conceptions. They were interested in the conceptions of 228 future primary and secondary school teachers in the canton of Geneva and the factors that influence these conceptions. They also addressed the question of the antagonistic nature of two conceptions: does having socioconstructivist conceptions imply the rejection of transmissive conceptions?

A latent class analysis revealed three profiles with differences between future primary and secondary school teachers. At the end of their training, future primary school teachers have more socioconstructivist

conceptions that are opposed to transmission, whereas the first-year future primary teachers and the majority of future secondary school teachers have mixed profiles: pro-transmission without rejecting socioconstructivism or the rejection of socioconstructivism without pronouncing themselves in favour of transmission.

Since Wanlin and Crahay's tool (2015) does not distinguish between the two teacher-centred approaches defined in this research (transmission and explicit approach), our study aims to enrich this instrument.

Hypotheses

Following this literature review, we formulate seven hypotheses:

1. Respondents can be characterised by three non-independent dimensions: socioconstructivist, transmissive and explicit conceptions.
2. There is a weak negative correlation between socioconstructivist and transmissive conceptions.
3. In *hautes écoles*, students have a more socioconstructivist than transmissive conception.
4. In *hautes écoles*, first-year students have a more transmissive conception than third-year students.
5. In *hautes écoles*, third-year students have a more "socioconstructivist" conception than first-year students.
6. There is a *haute école* effect, some being more socioconstructivist than others.
7. There is a university effect, ISCED 3 teachers being less socioconstructivist than their ISCED 1 and 2 counterparts.

Method

Sample

To test these hypotheses, a pen-and-paper questionnaire was administered to 563 pre-service teachers in French-speaking Belgium. This sample comes from five *hautes écoles* and one university in different school networks within the Wallonia-Brussels Federation. The distribution of these students according to their course of study is presented in Table 1. There are 298 pre-service primary school

teachers and 265 pre-service lower and upper secondary school teachers. This sample consists of 439 women and 124 men.

Table 1. Description of occasional sample by training taken

	PRIMARY	LOWER SECONDARY	UPPER SECONDARY	TOTAL
N	298	201	64	563

The 298 pre-service primary school teachers come from five different *hautes écoles* with students from the first and third years. The distribution within these *hautes écoles* and years is shown in Table 2. Among these future primary school teachers, there are 257 women and 41 men.

Table 2. Distribution of pre-service primary school teachers in the five hautes écoles

HAUTE ÉCOLE **2**[1]		*HAUTE ÉCOLE* **3**		*HAUTE ÉCOLE* **5**[2]		*HAUTE ÉCOLE* **6**		*HAUTE ÉCOLE* **7**	
69		50		15		100		64	
1st year	3rd year	1st year	3rd year	1st year	3rd year	1st year	3rd year	1st year	3rd year
40	29	32	18	8	7	83	17	46	18

The 265 pre-service secondary school teachers come from three different institutions with students from the first and third years at *hautes écoles* and students following the *agrégation* at university. The distribution within these institutions is shown in Table 3. There are 182 women and 83 men.

Table 3. Distribution of pre-service secondary school teachers in three institutions

UNIVERSITY	*HAUTE ÉCOLE* **3**		*HAUTE ÉCOLE* **5**	
64	107		94	
agrégation	1st year	3rd year	1st Year	3rd year
64	75	32	74	20

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1   The numbering of *hautes écoles* begins at 2 because code "1" has been given to the university.

2   *Haute école* 4 has been removed from the analyses because only first-year students answered the questionnaire.

Pre-service lower secondary education teachers from the first and third years, as presented in the table above, follow different training courses depending on the subject they will teach: French/non-denominational philosophy, French/French as a Foreign Language (FLE), education in philosophy and citizenship, Germanic languages, mathematics, sciences, humanities, home and social economics or plastic arts. The distribution of pre-service lower secondary teachers by subject is shown in Table 4.

Table 4. Distribution of future lower secondary school teachers by subject studied

SUBJECTS	N
French/non-denominational philosophy	13
French/FLE	30
Education in philosophy and citizenship	9
Germanic languages	26
Mathematics	62
Sciences	19
Humanities	30
Home and social economics	21
Plastic arts	5

These pre-service teachers were interviewed using a pen-and-paper questionnaire. All of them took a position on the 65 items of the questionnaire, adapted from Wanlin and Crahay (2015), on a Likert scale ranging from "total disagreement" to "total agreement".

Questionnaire
The questionnaire was composed of 65 items, 63 of which are associated with socioconstructivist (constr), transmissive (trans) or explicit (expl) approaches. These are presented in Annex 1. There are 17 socioconstructivist, 12 transmissive and 34 explicit items. This inequitable distribution is explained by a change made to the structure of the questionnaire in order to validate it. Thus, some items making up the explicit scale are in fact subsets made up of common points between the explicit approach and the other two approaches. These

subsets have been omitted in order to ensure the internal validity of this new scale. Two "caricatural" items were added. These are marked with a C in Annex 1. Of these 65 items, 30 were taken from the Wanlin and Crahay (2015) questionnaire and 35 were added (these 35 added items are followed by a * in Annex 1).

The items have been mixed to avoid order of presentation effects. For each item, respondents were asked to rate their level of agreement on a six-point Likert scale ranging from "strongly disagree" to "strongly agree". The even number of categories encourages decision making on the part of respondents, who are obliged to position themselves (Berthier, 2011). The few nonresponses (maximum 6 by item) were coded as 3.5, meaning that the respondent does not agree or disagree with the statement.

In addition, other information such as the type of training ("Groupe" variable), level of education ("Bloc" variable), gender, employment history in teaching, institution attended ("Institution" variable) and the subject chosen by pre-service lower secondary school teachers were also collected to enable an analysis of the possible influence of these variables on the conceptions of future teachers.

Results

Respondents can only be characterised by two non-independent dimensions (socioconstructivist and transmissive conceptions) and there is a weak negative correlation between them

Our first hypothesis cannot be confirmed: we cannot show any evidence of an "explicit" dimension in respondents, whereas the socioconstructivist and transmissive dimensions are consistent. On the one hand, Cronbach's alpha is good for the socioconstructivist (.74) and transmissive (.78) scales, showing acceptable internal consistency, but not for the explicit (.54) scale. On the other hand, a factor analysis (MinRes, Oblimin rotation) shows that although up to seven factors could be retained, only two factors have eigenvalues greater than 1, these two factors being the socioconstructivist and the transmissive conceptions. All the socioconstructivist items load on factor 1 and all the transmissive items load on factor 2 (except for item 42). Explicit items load on either the socioconstructivist or transmissive dimension. The factor analysis also showed that item number 42, "The teacher should

define the objectives of each lesson before teaching", actually loads more on the socioconstructivist factor than on the transmissive factor. It has subsequently been removed from the analyses (Cronbach's alpha for the modified transmissive scale is .79). Scores for each of the two conceptions are calculated by adding the points given to each item (from 1 for "total disagreement" up to 6 for "total agreement"), then dividing this number by the number of items. Since the consistency of the scale is too weak, no score has been calculated for the explicit approach.

Our factor analysis shows that there is a weak negative correlation of $r = -.13$ between the two principal factors, identified as a transmissive and a socioconstructivist conception. Plotting the score of the transmissive conception against the score of the socioconstructivist conception gives Figure 1, which shows a weak negative correlation ($r = -.25$) between the two conceptions. Note that the variance of the residuals is so high that having a high score in socioconstructivism can be associated with a low score in "transmission" just as well as a high one.
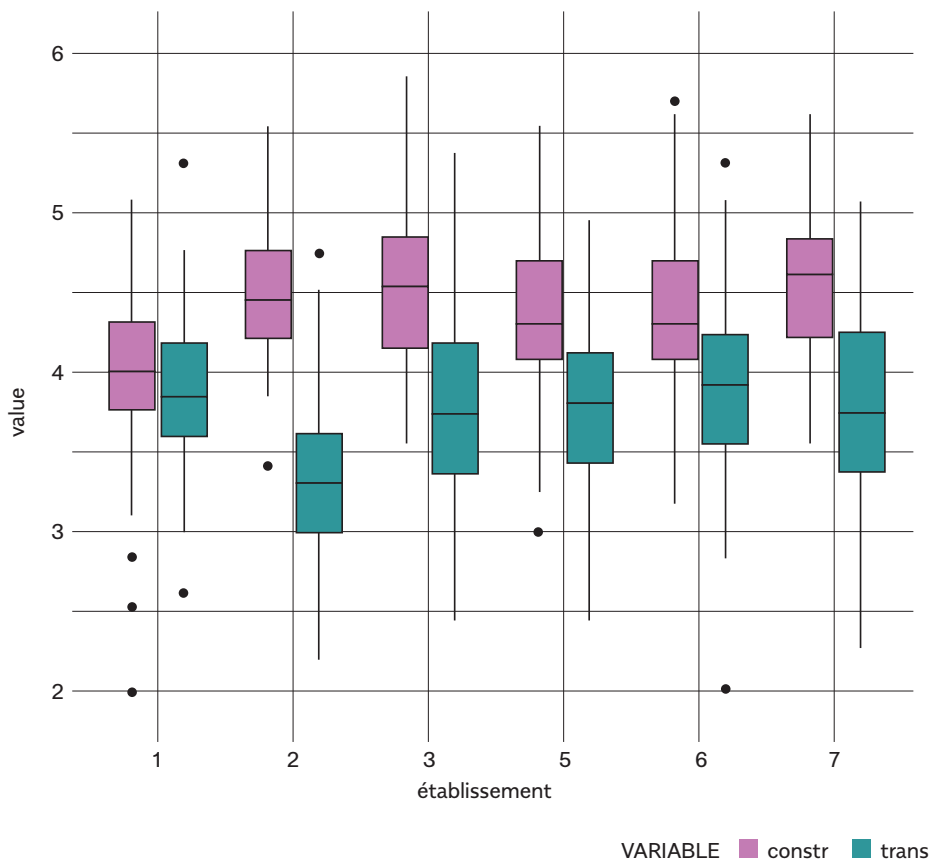
Figure 1. Transmissive vs socioconstructivist conceptions
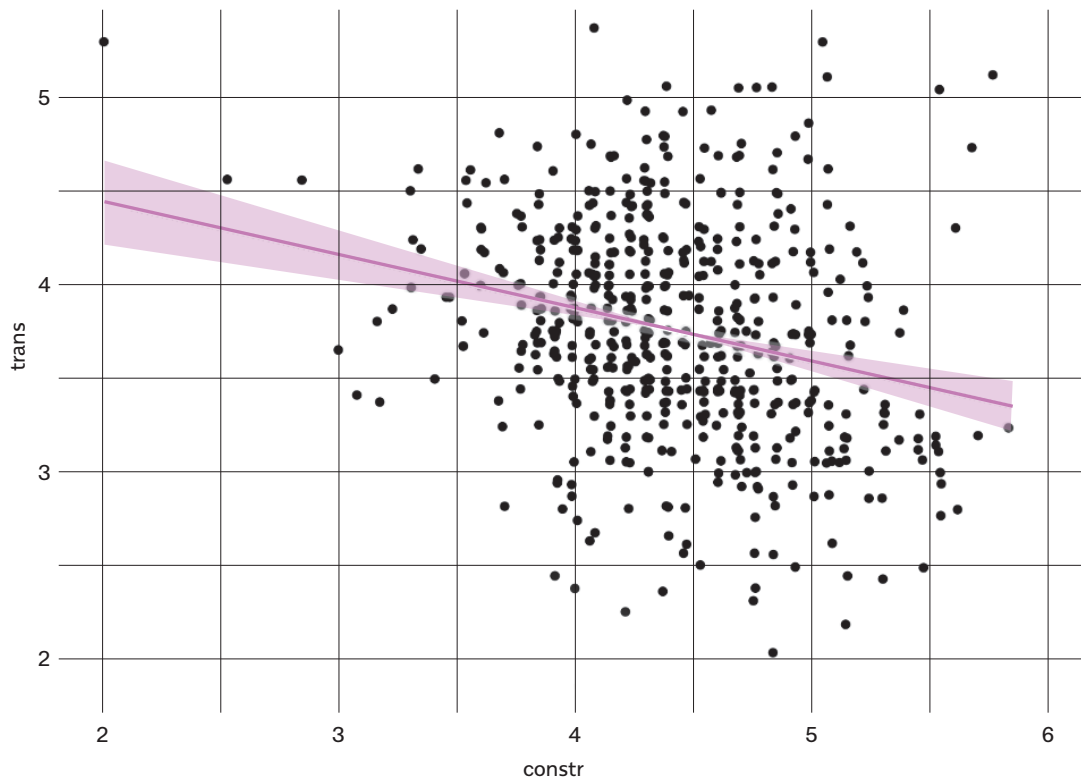
In hautes écoles, students have a more socioconstructivist than transmissive conception

As Figure 2 shows, the score of the socioconstructivist conception is always higher than the score of the transmissive conception, especially in *hautes écoles*. Our hypothesis is therefore confirmed.

Figure 2. Scores of transmissive and socioconstructivist conceptions by institution


In hautes écoles, first-year students have a more transmissive conception than third-year students, who have a more socioconstructivist conception

As Figure 3 shows, the third years have a markedly lower score than the first years on the transmissive conception. Our hypothesis is thus confirmed. Teacher training seems to have an impact on the rejection of a transmissive approach. The difference between first years and third years on the socioconstructivist conception is shallower as, from their

first year, pre-service teachers already embrace a socioconstructivist conception. This effect could be due to the time of year our survey was undertaken, i.e. in February and March, when first years had already spent a full term in their *hautes écoles*.

Figure 3. Transmissive and socioconstructivist conceptions from the first and third years in *hautes écoles*

VARIABLE ■ constr ■ trans
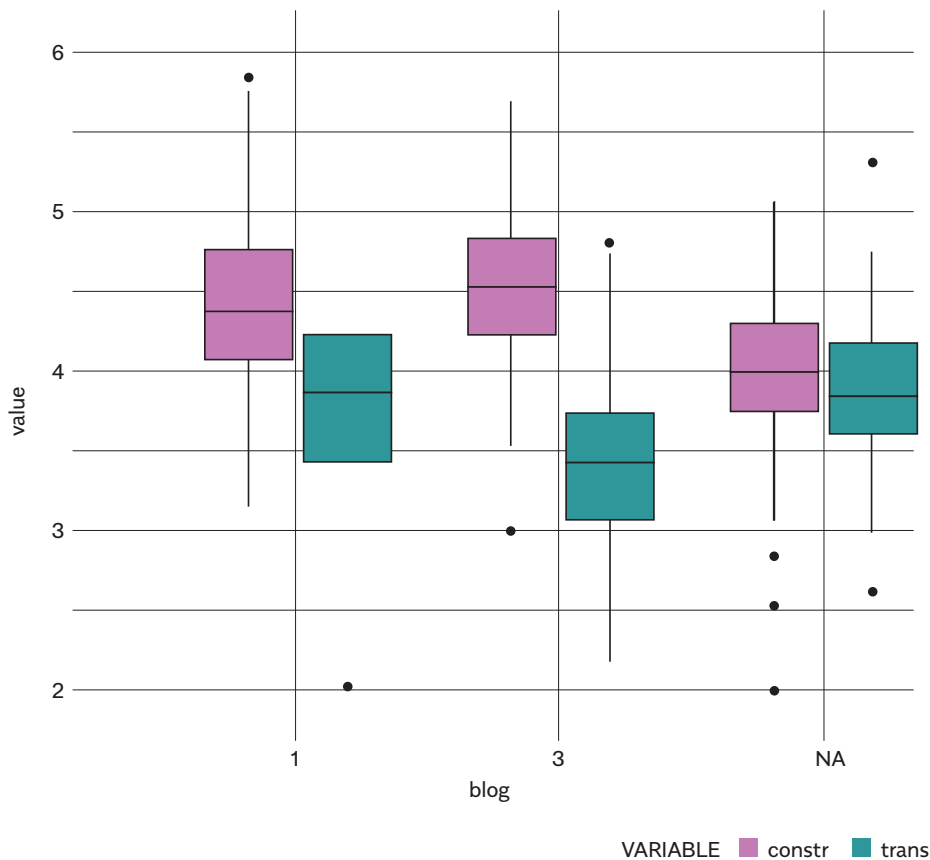
NA – the university students doing their *agrégation*.

There are institution, year and training effects explaining variations in pre-service teachers' conceptions

In order to test our hypothesis of an institution effect, we ran multilevel analyses trying to predict the extent to which students embrace the transmissive conception, then the socioconstructivist conception, using institution as a level-2 random variable. Multilevel modelling first starts with a null model where no predictor is inserted. This null model gives us the proportion of variance explained by the institution. Our null model is the following:

$$\text{score}_{ij} = \beta_O + u_{Oj} + e_{ij}$$

where $_{ij}$ is the score (transmissive or socioconstructivist conception) of student $_i$ in the institution, n_j, β_O is the grand mean of students' scores across *hautes écoles*, u_{Oj} is the effect of institution j on students' conception and e_{ij} is a student-level residual.

Based on this null model, we compute the variance partition coefficient (VPC), which gives us the proportion of total variance that is due to differences between institutions:

$$VPC = \frac{\sigma^2 u_0}{\sigma^2 u_0 + \sigma^2 e}$$

The proportion of total variance of the transmissive conception that is due to differences between institutions (*hautes écoles* and university) is 10%, whereas this proportion is 13.8% for the socioconstructivist conception.

Adding the year of study as a fixed effect (only for the *hautes écoles*, as there is only one year of study in the *agrégation*), the equation is the following:

$$\text{score}_{ij} = \beta_O + \beta_1 year_{ij} + u_{Oj} + e_{ij}$$

This analysis gives a coefficient of -0.36 for the transmissive conception, which means that, controlling for the institution effect, third years have a score for "transmission" that is on average 0.36 points (on 6) lower than their first-year counterparts. The proportion of variance explained by the institution level drops to 8% when adding this fixed effect, which means that the year of study captured some variation, but not all.

The coefficient for the socioconstructivist conception is 0.12, which means that, controlling for the institution effect, third years have a score for socioconstructivism that is on average 0.12 points (on 6) higher than their first-year counterparts. Here, the proportion of variance explained by the institution level drops more dramatically to 1.1%,

which means that the year of study captures most of the variation between *hautes écoles*. In other words, there is no *hautes écoles* effect on the socioconstructivist conception, but there is a year of study effect and a university effect (students at the university have a lower score for socioconstructivism).

These institution and year effects are summarised in Figures 4 and 5.

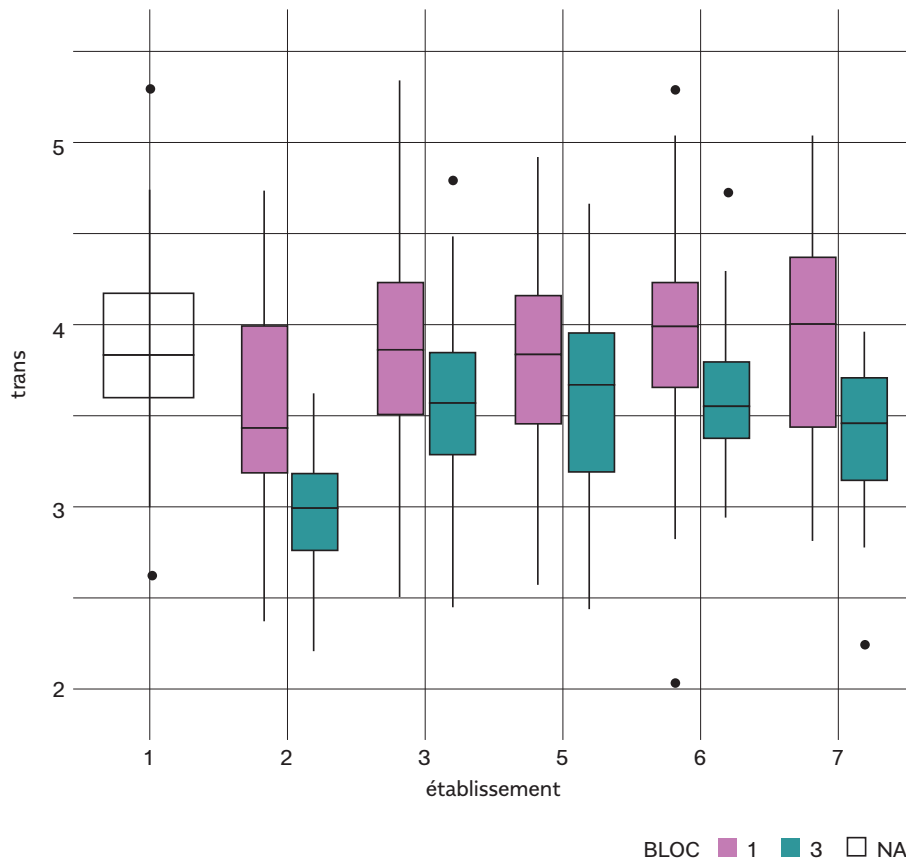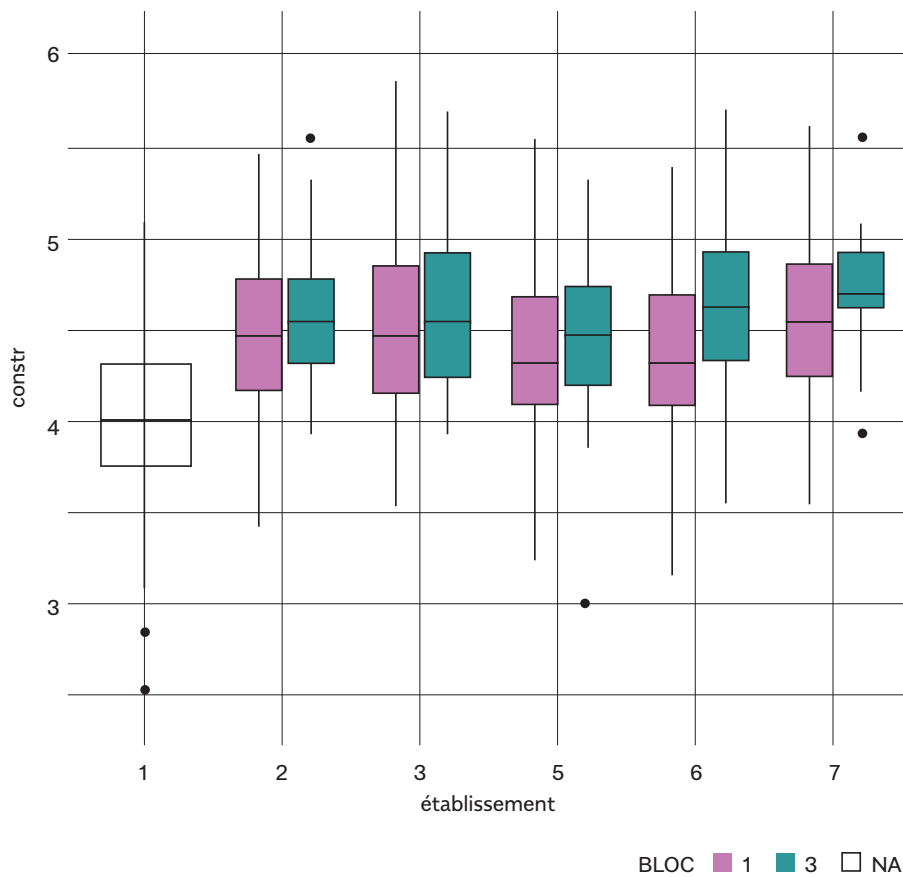**Figure 4. Institution and year effects on the transmissive conception**

Figure 5. Institution and year effects on the socioconstructivist conception

Adding the training taken (primary vs lower secondary) as a fixed effect (only for the *hautes écoles*, as there is only one training – upper secondary – at university), the equation is the following:

$$score_{ij} = \beta_O + \beta_1 year_{ij} + \beta_2 training_{ij} + u_{Oj} + e_{ij}$$

This analysis reveals an effect of the training taken on both transmissive and socioconstructivist conceptions, controlling for the institution and year. Pre-service lower secondary teachers have a more transmissive (β_2 = 0.10) and less socioconstructivist conception (β_2 = -0.13) than pre-service primary teachers.

Discussion

First of all, our results do not support the existence of a consistent explicit conception in our respondents. However, our analyses show some interesting results regarding the transmissive and socioconstructivist approaches.

Future teachers generally have socioconstructivist conceptions without rejecting transmissive conceptions, the correlation between the two scales being only slightly negative. This is in line with the conclusions of Wanlin and Crahay (2015), who invalidated the systematic antagonism between these two conceptions. It is also consistent with the findings of Chan and Elliott (2004), who argue that future teachers in Hong Kong do not only believe in one pedagogical design.

Nevertheless, the profiles are different depending on the training followed. For example, pre-service primary school teachers are the most critical of transmissive conceptions. Pre-service upper secondary teachers are more critical of socioconstructivist conceptions. There is also a year of study effect, with future teachers becoming more socioconstructivist and less transmissive as they progress through their training.

These findings are similar to those of Daguzon and Goigoux (2007) and Su (1992, cited in: Nettle, 1998), for whom pre-service teacher education influences teacher conceptions. Indeed, current training in French-speaking Belgium advocates a competency-based approach that is assimilated into socioconstructivist approaches (Maroy, 2002). These results are also in line with those of Wanlin and Crahay (2015), who showed that in Switzerland, as they advance in their training, pre-service primary school teachers become more and more in favour of socioconstructivism and opposed to transmissive teaching.

In addition to differences between years of study, differences between the training institutions for pre-service primary school teachers were also revealed. This institution effect suggests that the training provided there does indeed play a role in the development/change in the pedagogical concepts of future primary school teachers. This result allows us to moderate the positions of Larochelle and Bednarz (1994) and Chin and Benne (1969, cited in: Boraita & Crahay, 2013), for whom training rarely allows conceptual change.

Interviews with education specialists and future teachers would make it possible to qualify the statements of pre-service teachers and compare them with those of their teachers in the manner of Nettle (1998) and Zanting and his colleagues (2001). In this way, it would also be possible to identify the source of variation in conceptions, as Vause (2009) has done, for whom theoretical courses develop beliefs about teaching strategies and practicums develop beliefs about students and learning. The study of the impact of practicums could also be an extension of this study. We would suggest interviewing future teachers before and after the practicums, in order to find out whether they provoke a backtracking of beliefs (Leavy, McSorley & Boté, 2007, cited in: Boraita & Crahay, 2013) or an evolution (Boraita & Crahay, 2013). It would also be interesting to compare the conceptions identified through the questionnaire with classroom practices in order to identify whether there are differences between what is said and what is done (Deaudelin et al., 2005). Moreover, following the example of Könings and his colleagues (2014), one could question the congruence of students' and teachers' conceptions of the act of teaching and the act of learning.

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—— **Annex 1**

Of these 65 items, 30 were taken from the Wanlin and Crahay (2015) questionnaire and 35 were added (these 35 added items are followed by a *).

NUMBER	ITEM	
1	The teacher should enable students to make connections between new knowledge and prior knowledge.*	expl
2	The main task of the teacher is to transmit knowledge and know-how to the students.	trans
3	Learning is enabled by students' research in solving problem tasks.*	constr
4	Good teaching always draws on the students' personal experiences.	constr
5	The student must work in a group before working alone.*	expl
6	Students are required to solve problems as often as possible as they have been taught in the classroom.	expl
7	The teacher must clearly define and communicate the objectives of the course to the students.*	expl
8	The teaching of academic knowledge and the teaching of social skills must be carried out at the same time.*	expl
9	Students can find procedures for solving many problems on their own and without the help of an adult.	constr
10	Students learn most when the teacher continually checks their understanding.*	expl
11	After the teacher has shown them how to do the exercises, the students move on to the exercises that they have to do independently, without the help of the teacher.*	trans
12	To be effective, the teacher must plan his or her lesson in a precise and non-rigid manner, based on the official curriculum.*	expl
13	The only evaluation that counts is the final evaluation.*	trans
14	Teachers need to motivate students to find their own ways of solving problems even if they are not very effective.	constr
15	Learners should have the opportunity to build their knowledge in collaboration with their classmates or with the teacher.	constr
16	The teacher should allow students to assess themselves.*	expl
17	The most effective teachers demonstrate the right way to solve problems to their students.	expl
18	Pupils should only be given problematic tasks when they have mastered the contents and procedures.	expl

19	When homework is given, it is to allow the student to discover new knowledge on his or her own.*	constr
20	As a general rule, students are not able to discover the relationships between the different contents on their own.	expl
21	It is important, to monitor the learning process, that all students do the same work at the same time and in the same way.*	trans
22	Before spending time on problem-solving, students must be given time to learn and retain the underlying procedures.	expl
23	The student must work alone before working in a group.*	constr
24	Students learn more when the teacher explains, demonstrates and exposes the content.	expl
25	At school, knowledge must be learnt like naturally acquired knowledge such as walking.*	constr
26	Previous knowledge is mastered by the students and does not need to be recalled.*	trans
27	The teacher should often give students the opportunity to solve problems in pairs or small groups.	constr
28	The teacher should never explain to students the procedures for completing a task.*	constr
29	For sustainable learning, it is imperative that students are brought to practise procedures and knowledge before solving complex problems or tasks.	expl
30	Students learn best when they follow their teachers' explanations.	trans
31	To be effective, the teacher must plan his or her lesson in a precise and non-rigid manner, based on the students' learning mechanisms.*	expl
32	Most students can find solutions to the problem tasks on their own.	constr
33	Learning is enabled by the teacher's questions and the students' answers.*	expl
34	In order for learning to take place, it is necessary to start from the students' initial representations.*	expl
35	Teaching must give priority to the acquisition of academic knowledge among students before social skills.	trans
36	Before the teacher demonstrates problem-solving procedures to students, the teacher should give them the opportunity to identify personal solutions to the problems.	constr
37	During the lesson, the teacher must first use elements that come from the students before introducing those from the official programmes.	constr
38	Students need a clear demonstration from the teacher on how to solve problems by applying the content.	expl

39	When homework is given, it is to allow the student to exercise knowledge and skills that have already been practised in class with the help of the teacher and students.*	expl
40	Learning should be based on the knowledge and skills that students already master and not on complex new tasks.	expl
41	After demonstrating the procedures to the students, the teacher should encourage work in pairs or small groups.*	expl
42	The teacher should define the objectives of each lesson before teaching.	trans (removed)
43	Allowing students to discuss their own resolution ideas helps them to understand the learning content.	constr
44	The teacher must assess the student as he or she learns.*	expl
45	A good teacher encourages students to verbalize their strategies.*	expl
46	The exercises should be organised in two stages: a first stage during which the students receive help and a second stage during which they are autonomous.*	expl
47	At school, knowledge must be learnt in a different way than natural knowledge such as walking.*	expl
48	Teachers need to communicate detailed problem-solving procedures that apply learning.	expl
49	The student must always work alone.	trans
50	It is important to focus on elements that are common to several contents/subjects if students are to learn.	expl
51	The teacher should interview all students, preferably in an equitable manner by making a random selection to determine who should answer each question.*	expl
52	During the exercises, students are autonomous, just like at the beginning of the learning process.	constr
53	Students should often be given the opportunity to reproduce the model resolutions demonstrated or explained by their teacher.	expl
54	At school, the learning context should be organised in such a way that students can identify the relationships between learning content on their own.	constr
55	Students learn best when they rephrase the teacher's explanations in their own words.*	expl
56	The homework assignment is the real moment when the pupil appropriates the new knowledge communicated in class by the teacher.*	trans
57	To be effective, the teacher must not deviate from the lesson plan that he or she has constructed using the official curriculum.	trans

58	During the lesson, the teacher can start with material from the official curriculum if he or she explains to the students why they are learning this.*	expl
59	Learning is made possible by the clearest possible presentation by the teacher.*	trans
60	The teacher should provide regular feedback to students.*	expl
61	Learning activities must always be rooted in the needs of the students.	constr
62	Students learn best when they have the opportunity to discover the solution to problems on their own.	constr
63	Mastery of the material is not essential; it is the way it is passed on that counts.*	constr
64	The student is always actively building his or her knowledge.*	expl
65	Students must first understand the contents and procedures before they are asked to practise them.	expl