Pre-service teachers’ conceptions on explicit, (socio-)constructivist and transmissive approaches to teaching and learning in French Speaking Belgium

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Pre-service teacher education in French-Speaking Belgium

• Takes place in different institutions according to the level at which future teachers will teach:
  – ISCED 0, 1 and 2: Tertiary colleges (Hautes Écoles), 3 years
  – ISCED 3: At university during subject training (master) or after (aggregation), 1 year.

• Pedagogical freedom: each teacher, as a “reflective practitioner” (Schon, 1984), is free to embrace his/her own approach to teaching and learning
Changing pre-service teachers’ conceptions

• It is often said that students arrive in pre-service teacher training with a “transmissive” preconception.

• Following Nettle (1998), we hypothesize that pre-service education has an effect in changing pre-service teacher’s conceptions.

• We also hypothesize that different colleges may have different effects, as their teacher trainers may embrace different approaches and pass them on to their students.
Study by Wanlin & Crahay (2015) on pre-service teachers’ conceptions

• Postulate the existence of a socio-constructivist doxa that structures an opposition between two approaches:
  – Socio-constructivist approach presented as the only legitimate contemporary approach
  – “Transmissive” approach

• Questionnaire to measure the extent to which pre-service teachers have a socio-constructivist vs a ”transmissive” conception of teaching and learning.
Study by Wanlin & Crahay (2015) on pre-service teachers’ conceptions

• Questionnaire

<table>
<thead>
<tr>
<th>Concept.</th>
<th>Example of items</th>
</tr>
</thead>
</table>
| Constr. (13 items) | • Letting the pupils discuss their own ideas of resolution help them understand learning contents  
• Learners should have the opportunity to construct their own knowledge in collaboration with their classmates or with the teacher  
• The teacher should often give to the pupils the opportunity to solve problems in pairs or in teams |
| Trans. (17 items) | • Pupils learn best when they follow their teacher’s explanations  
• Pupils need a clear demonstration by the teacher of the way to solve problems by applying contents  
• Pupils learn best when the teacher explains, demonstrates and expounds the contents |
Study by Wanlin & Crahay (2015) on pre-service teachers’ conceptions

• Their results
  – pre-service teachers do not embrace a dichotomized conception of approaches to teaching and learning
  – Many of them prefer one approach without rejecting the other

• But what if they forgot one conception of teaching and learning?
  – Explicit teaching is often confused with a caricatured “transmissive” approach but is different.
Explicit teaching

• Visible behaviours of teachers and learners (Hattie, 2009)
• Proven to be effective in a wide range of situations
• Three phases
  – Preparation: planning, objectives, steps
  – Interaction: I do it / We do it / You do it
  – Consolidation: daily/weekly/monthly review, independent practice, transfer, evaluation

## Transmissive vs explicit teaching

<table>
<thead>
<tr>
<th>Transmissive teaching</th>
<th>Explicit teaching</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monologue by the teacher</td>
<td>Dialogue between teacher and pupils</td>
</tr>
<tr>
<td>Teacher checks understanding at the</td>
<td>Teacher checks understanding continuously</td>
</tr>
<tr>
<td>end of the lesson</td>
<td></td>
</tr>
<tr>
<td>Pupil is passive, listens</td>
<td>Pupil is active, is constantly asked to do something</td>
</tr>
<tr>
<td>Autonomous practice</td>
<td>Guided practice first, then autonomous practice</td>
</tr>
</tbody>
</table>

### Questionnaire

- **New items on explicit teaching**

<table>
<thead>
<tr>
<th>Concept</th>
<th>Example of items</th>
</tr>
</thead>
</table>
| Expl. (14 items) | - Exercises should be organized in two steps: a first step when pupils get help and a second step when they do autonomous work  
- The teacher should clearly define and communicate the objectives of the lessons to the pupils  
- Pupils learn best when the teacher checks continually their understanding |
Hypotheses

1. Respondents can be characterized on three non-independent dimensions: (socio-)constructivist, “transmissive” and explicit approaches
2. There is a weak negative correlation between (socio)-constructivist and transmissive conception
3. In tertiary colleges, students have a more (socio-)constructivist than “transmissive” conception
4. In tertiary colleges, first-year students have a more “transmissive” approach than third-year students
5. In tertiary colleges, third-year students have a more “(socio-)constructivist” approach than first year students
6. There is a college effect, some being more (socio-)constructivist than others
Sample

• 563 pre-service teachers from 5 colleges and 1 university
  – Colleges:
    • year 1 and 3
    • ISCED 1 and ISCED 2
  – University:
    • Agregation
    • ISCED 3
Hypothesis 1: 3 dimensions

- This hypothesis isn’t validated
- Cronbach’s alpha:
  - (socio-)constructivist: .74
  - Transmissive: .78
  - Explicit: .54
- Factor analysis (MinRes, Oblimin rotation)
  - 2-factors solution
  - Explicit items load on either (socio-)constructivist or transmissive dimension
  - Correlation between the two factors: -0.13
  - One item must be removed from the transmissive approach.
Hypothesis 2 : Negative correlation

There is a weak negative correlation between (socio)-constructivist and transmissive conception: $r = -0.25$
(socio-)constructivist vs “transmissive” conception
The difference widens in year 3
College and year effect on “transmissive” conception

- Proportion of variance explained by the “college” level: 9%
- Proportion of variance explained by the “year” level: 10%
College and year effect on (socio-constructivist) conception

- Proportion of variance explained by the “college” level: 1% (14% if we take university into account)
- Proportion of variance explained by the “year” level: 1%
Conclusions

• Some evidence for a (socio-)constructivist doxa in colleges: pre-service teachers embrace from the beginning a (socio-)constructivist conception.
• This doesn’t mean that pre-service teachers, especially from first year, reject the “transmissive” conception.
• College and year effect mainly on the rejection of the “transmissive” conception.
• Future ISCED 3 teachers, at university, have less (socio-)constructivist conceptions than their college counterparts
Thank you

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Chargé de cours

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## Annex - Sample

### Contingency Tables

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<thead>
<tr>
<th>Groupes</th>
<th>Bloc</th>
<th>Etablissement</th>
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<tr>
<td></td>
<td>Total</td>
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</table>
Annex – Factor analysis

Parallel Analysis Scree Plots

- FA Actual Data
- FA Simulated Data
- FA Resampled Data
Annex – Linear mixed model

Modèle incluant le bloc comme prédicteur au niveau individuel

```r
modeltrans <- lmer(trans ~ (1 | Etablissement) + Bloc, data = resume, REML = FALSE)
summary(modeltrans)
```

```r
## Linear mixed model fit by maximum likelihood ['lmerMod']
## Formula: trans ~ (1 | Etablissement) + Bloc
##    Data: resume
##
## AIC      BIC   logLik deviance df.resid
## 780.7    797.6   -386.4    772.7     495
##
## Scaled residuals:
##    Min     1Q Median     3Q    Max
## -3.4022 -0.6435 -0.0097  0.5866  2.8279
##
## Random effects:
##    Groups       Name   Variance Std.Dev.
##    Etablissement (Intercept)  0.02576   0.1605
##    Residual                  0.26915   0.5188
## Number of obs: 499, groups: Etablissement, 5
##
## Fixed effects:
##    Estimate Std. Error t value
## (Intercept)  3.87814    0.07726   50.191
## Bloc3       -0.35148    0.05226   -6.726
##
## Correlation of Fixed Effects:
## (Intr)     Bloc3
## (Intr)   -0.194
## Bloc3    -0.194
```
Annex – Linear mixed model

Modèle incluant le bloc comme prédicteur au niveau individuel

```r
modelconstr <- lmer(constr ~ (1 | Etablissement) + Bloc, data = resume, REML = FALSE)
summary(modelconstr)
```

```
## Linear mixed model fit by maximum likelihood ['lmerMod']
## Formula: constr ~ (1 | Etablissement) + Bloc
##    Data: resume
##
## AIC   BIC   logLik deviance df.resid
## 672.3 689.2   -332.2    664.3      495
##
##Scaled residuals:
##   Min     1Q   Median     3Q    Max
##-3.2515 -0.6857 -0.1357  0.6699  2.9220
##
##Random effects:
##  Groups   Name        Variance   Std.Dev.
##  Etablissement (Intercept) 0.002503  0.05003
##   Residual               0.220031  0.46907
## Number of obs: 499, groups: Etablissement, 5
##
##Fixed effects:
##   Estimate   Std. Error   t value
##  (Intercept) 4.440470   0.033840   131.214
##   Bloc3      0.128360   0.046980    2.732
##
##Correlation of Fixed Effects:
##   (Intr)   Bloc3
##(Intr)  1.000  -0.394
##Bloc3  -0.394  1.000
```