Four discourse models of physics teacher education

Johanna Larsson¹, John Airey¹,²

¹ Uppsala University
Department of Physics and Astronomy

² Stockholm University
Department of Mathematics and Science Education
Overview

Main research project

Our work in Sweden
The setting and data collection
Analysis
The four models
Potential identity performances
4-year research project

Building a professional identity:

A comparative study of physics teacher training in four countries

Sweden
Finland
England
Singapore
OECD TALIS Survey

Teaching and Learning International Survey administered by OECD

Asked the question:
Do you believe that the teaching profession is valued in your country?
OECD TALIS Survey

Singapore: 70%
Finland: 59%
England: 32%
Sweden: 5%
Research questions

In four countries where the societal status of the teaching profession differs widely:

1. What discourse models are enacted in the educational environments trainee physics teachers meet?

2. What are the potential affordances and constraints of these discourse models for the performance of physics teacher professional identities?
Aim of the project

Study the system of physics teacher education as a site for professional identity performances

Physics department
Education department
School
Study design: RQ1

Interviews with teacher educators.

Three mentors
Three education lecturers
Three physics lecturers.
Interview themes

– What is important for students to learn?
– What is special about being a physics teacher?
– What should your part of the education contribute?
Iterative coding of interview transcripts

- What is valued?
- What should the students learn?
- What is the goal in this environment?
Theoretical framework

Discourse models (Gee 2005)

Our ‘first thoughts’ or taken-for-granted assumptions about what is ‘typical’ or ‘normal.’
Identifying Gee’s discourse models

“What must I, as an analyst assume that people feel, value and believe, consciously or not, in order to talk (write) act, and/or interact this way?”

Gee (2005:93).
I think that [the physics courses] should adjust to the goals of schooling. [...] in practice this means what is in the curriculum. So to a large extent [...] secondary teacher education should adjust to the demands, values, and directives of the school physics curriculum.
Here university physics courses are judged on their relevance for the school physics curriculum.

Original coding
Subject according to syllabus

Became part of...
Curriculum implementer discourse model.
The discourse models

Identified four dominant discourse models...

- Curriculum implementer
- Practically well-equipped teacher
- Critically reflective teacher
- Physics expert
<table>
<thead>
<tr>
<th>Model constructed from the talk of</th>
<th>Educational input</th>
<th>Purpose/goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics lecturers, Education lecturers, Mentors</td>
<td>Practicum, Pedagogical courses</td>
<td>Practically well-equipped teachers</td>
</tr>
<tr>
<td>Education lecturers</td>
<td>Pedagogical courses, Practicum</td>
<td>Critically reflective teachers</td>
</tr>
<tr>
<td>Education lecturers, Mentors</td>
<td>Pedagogical courses, Syllabus physics</td>
<td>Curriculum implementers</td>
</tr>
<tr>
<td>Physics lecturers, Mentors</td>
<td>Courses in physics</td>
<td>Physics experts</td>
</tr>
</tbody>
</table>
The discourse models

Make the education meaningful in relation to a goal

This goal is a particular type of professional

No model belongs to one environment

But…
Educators from the same environment tend to relate to the different models in similar ways.
No one model values the whole of the training programme.

The models are often in opposition...

Risk that trainees do not value parts of their programme.
The discourse models

The physics expert model was the dominant model used by both mentors and physics lecturers.
Physics expert model and teacher education

• Teaching is an unnatural choice.

• School physics is about creating future physicists.
The mentors are also physics teachers.
What about their identity performances?
Physics teacher stories ...
Possible identity performances
“And last, but not least of course, you have to feel that you have the vision to make at least 80% of your students want to become a physicist after taking your class.”
“What everyone really wants to work with is research. You want to do something that is new and creative. That’s got to be the goal for most people, right? To just repeat what others have done feels — that’s second order, it’s not the same thing. Then of course it can be important and useful but it’s still not like the teachers contribute to the country's GDP.”
The fallen angel

“I never wanted to become a teacher. Because in contrast to other teachers I was a top student. I was one of the best in Sweden, in mathematics and physics.”
“In the beginning I made one of the other teachers angry with me when I said that I was the only physicist in the school, the others were physics teachers. Because it’s not until you’ve been the leader of a research group you can really call yourself a physicist.”
“One of the things that surprised me when I started, because I was really the kind of person to do research, was that I really like the students. The social part of teaching. That part is hard to know about beforehand.”
Conclusion

Four discourse models:

Curriculum implementer
Practically well-equipped teacher
Critically reflective teacher
Physics expert
Given the incompatibility of these models seems that the three environments are by default emphasizing quite different values.

None of these models is “wrong”
The value of this work?

Claim that knowledge of these models can help educators see past their own default value systems and acknowledge other systems as important.
Claim that knowledge of these models can help trainees think about the type of teacher they want to be.
Future work

How do trainees negotiate these models in order to create their own professional identity performances?
Thank you!

johanna.larsson@physics.uu.se
References

• References

