Physics teacher education in Finland and reasons underlying the top scores of Finnish students in international assessments
Some historical reasons for the “top scores”

• Young society
  – Finnish have taken huge steps towards the high-tech and education-orientated society after the World War II
  – Education has been appreciated highly
    • Education has guaranteed a good job and/or a good position in society
    • Education has seen as an important issue by parents
  – Homogeneous population
    • Children learn basic skills (reading, writing, calculating) quickly
A Reform of Finnish Education 1970 -

• 1921 Law of Basic Education
  – Children study at least 4/6 years
    • Aims of law did not come true
    • Some continued to vocational education
    • And some to more theoretical education
      – expensive

• Reform 1970
  – Free 9 years long education for all
  – Model from Sweden and influences from East Germany
  – Probably the most important education reform in Finland

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Teacher education

Influences

• From didactical and pedagogical traditions
• Nowadays influences come also from English-speaking countries
• Universities or even subject departments have much freedom to decide on their teacher education programs
• An unique university training school system
  – Enough resources - expensive
• National Core Curriculum for School Education
  – Define aims and contents at general level, not too strict
  – Trust in teachers’ professional competence
Physics teacher education program in UEF

- Students can apply directly to the teacher education program
- Student teachers are doing same courses than fortcoming physicists
- They are “learning” lot of theory and problem-solving
  - Two laboratory courses especially for student teachers
- At the beginning of second year student teachers do their first pedagogical studies and the first training period at university training school
  - Being a physics teacher for the first time!
### Master degree studies

<table>
<thead>
<tr>
<th>Year</th>
<th>Studies on minor subjects</th>
<th>Special courses for teachers</th>
<th>Pedagogical studies 35 cp includes three training periods at school</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>4.</td>
<td>Advance level studies on physics (8 cp) etc. material physics Special courses for teachers • History of physics • Conceptual physics • Problems on understanding physics • Physics as a structural science • Quantum physics for teachers • Some laboratory practice</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>5.</td>
<td>M.Sc. Thesis in Physics (education) 20 cp</td>
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</tbody>
</table>

- **Special courses for student teachers**
  - Different perspectives to physics
    - Historical, conceptual, philosophical, structural, etc.
    - Physics is not an isolated domain of knowledge
  - Students’ knowledge need to be re-organised
  - Students face the questions what, why, and how to teach
  - Ideas of all courses have been tested in in-service education
Finally

• Graduated teachers have a licence to teach but real maturation comes with years
  – How to find right kind of ingredients for well-balanced maturation?

• Co-operation between three partners is important issue: subject departments, department of applied education (pedagogical studies), and university training school
  – The partners has a common aim – a good physics teacher
  – Some attempts to create a common theoretical framework

• There are different kind of teacher education programs in Finland
  – Some subject departments have special master programs for student teachers and some haven’t
  – There is no evidence for the superiority of any program
Thank you!

More information about physics and teacher education research of PERG - UEF:
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