Physics Teachers in England
What is a ‘good’ one?

James de Winter
Who cares about ‘good’ physics teachers

- Physics Education Stakeholders
- Those Working With Physics Teachers
- Physics Teachers

Stakeholder Survey

- ‘Identity’ and expectations (UK, Sweden, Finland, Singapore)
- Developing ‘identity’ during training year(s)
- Focus on particular areas – e.g. Maths and Physics
What do I want?

- What does the wider education community think/expect.
- To engage with the teacher education community to refine/develop an understanding of this.
- To see if it is possible to develop some kind of framework with subject specific exemplification.
- So we can better train the next generation of physics teachers.
Where to start?

Ask the people who have an interest in physics teachers and physics education what they think/expect

What is a ‘good’ physics teacher?
What is the Question?

Is there a necessary and sufficient set of attributes for physics teachers entering the profession?

Research Questions

**RQ1**: What do a range of stakeholders see as the key attributes of a ‘good’ physics teacher?

**RQ2**: To what extent do these attributes vary across different stakeholder groups and between contexts?
How did we ask them?

Stage I: Open description of the attributes of a ‘good’ physics teacher

Stage II: Identify three attributes of a specific ‘good’ physics teacher

Stage III: Context specific questions on these chosen attributes

593 coded quotes

320 attributes

N=127
Most common attributes from Stage I

- Subject knowledge
- Good communication and explanation skills
- Providing context and making physics relevant
- Understands the challenges students face
- Is enthusiastic
- Shows a love of physics
- Is engaging
Most common attributes from Stage I

- Regular practical work/demonstrations
- Breaks ideas down into accessible stages
- Knows and supports the mathematical challenges
- Knows, understands and is able to use appropriate pedagogies
- Believes in students and their ability to succeed
- Motivates, challenges and stretches students
# Top 6: Stage I and Stage II

<table>
<thead>
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46% of all coded responses (593)  64% of all coded responses (320)
**RQ1:** What do a range of stakeholders see as the key attributes of a ‘good’ physics teacher?

*Whilst there was a large range of responses, from Stage I and Stage II, the following attributes were the most common.*

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Theme #1

• Might some attributes be innate?
• What can be learned?
• How can you learn it?
• And when?
  • If it is innate does it become a recruitment criteria?
  • What can be achieved in a training year?
  • What should part of in-service professional development
Theme #2

• Do we have a language to talk about what physics teachers are and we want them to be?

• *Has PCK become to all encompassing?* - Novice Empathy was a focus solely on conceptual challenges.

• Classroom examples of attributes were vague and often ill defined.
Reflection on Practice #1

• Communication/Explanation was one of the most regularly chosen attributes.
  • In my work, have I placed enough explicit emphasis on this?
Stage III: Context

Using the participant-identified attributes from stage II

Is the importance of these attributes dependent upon?

• Age of students
• Academic ability of students
• Physics, science or any subject
**RQ2:** To what extent do these attributes vary across different stakeholder groups and between contexts?

*In most cases, attributes were seen as being of equal value to students of all ability and all age ranges.*

However:

- A significant minority of respondents felt that subject knowledge is;
  - more important for older students (A level)
  - more important for academically able students

- A significant minority feel that the attribute explainer/communicator is more important for less academically able students
Next Steps

• Collect ‘good’ physics teacher data from students (11-18)
• Follow up interviews with a sample of respondents to look more deeply at response
• Refine the attributes and use these to help develop a framework to investigate trainee teachers as they move from graduates (pre-course), through the trainee year and into their early careers.
Questions?
Comments?
Thoughts?
Ideas?
Links

• James’s email: Jad26@cam.ac.uk
• ESERA presentation on this work: http://uu.diva-portal.org/smash/record.jsf?pid=diva2%3A1138493&dswid=422
• ESERA paper on this work (4 pages)