
Quality Assurance in Teacher Education: through the lens of didactics – learning and teaching

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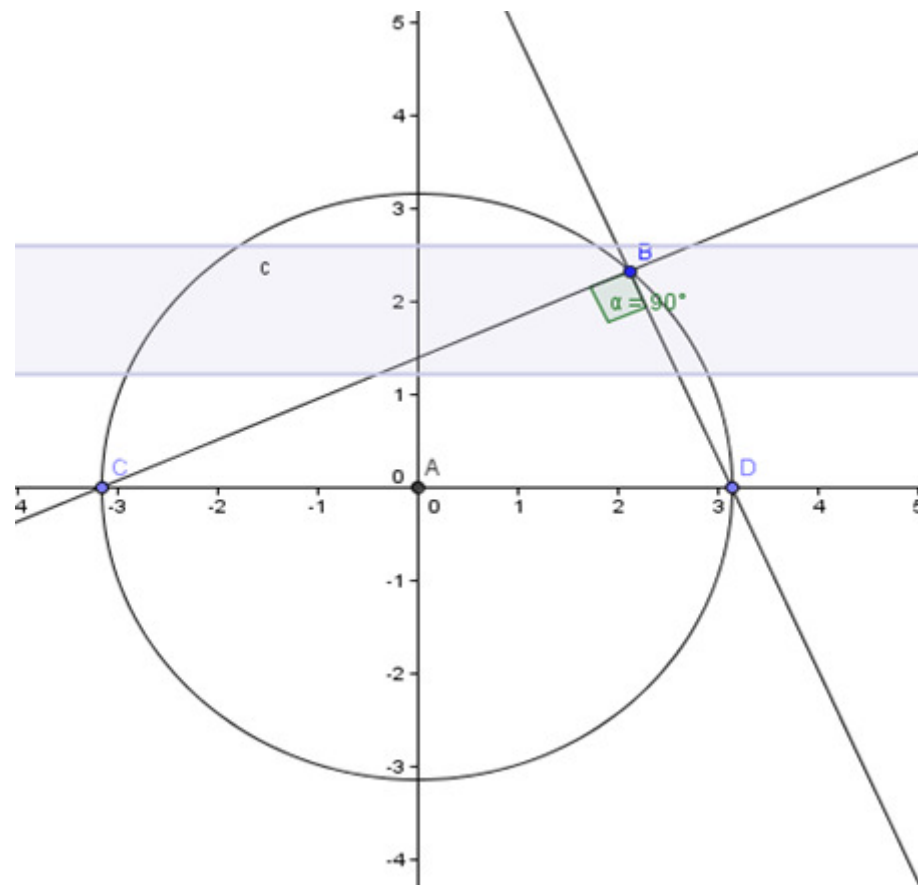
Structure of the presentation

- On the nature of quality
 - On European traditions of Educational Sciences
 - On associated conceptual tools for thinking about teaching, studying and learning
 - On the question of content, particularly of mathematics
 - On the importance of research in and on TE, the role of HE and the place of subject didactics
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But first an initial activity ...

- What words immediately come to mind when you think about doing maths?

And secondly ... what can you see and what can you say?



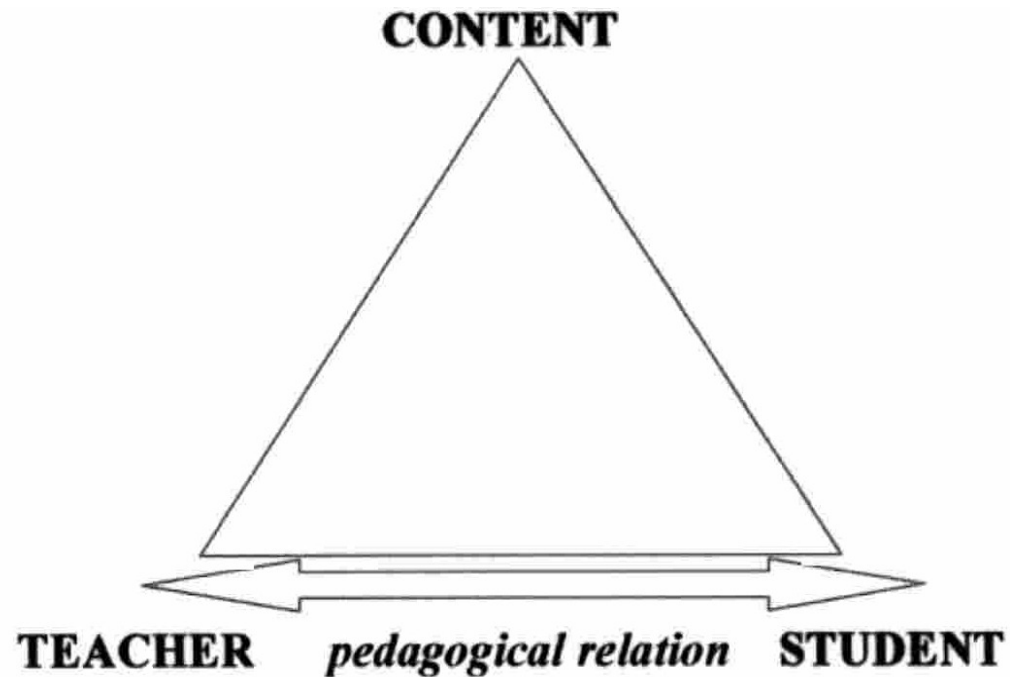
On the nature of quality

- No absolute agreed definition – no agreed way to measure quality – it is culturally bound – a value depending on concepts of knowledge and knowledge creation, learning and teaching (Hannele Niemi, 2010)
 - In relation to HE it is about “safeguarding the public interest in the sound standards of higher education qualifications and informing and encouraging continuous improvement in the management of the quality of higher education” (Quality Assurance Agency)
 - The term 'quality' is often used in a vague, blurred way. If someone talks about 'working on quality', they may simply mean activities designed to improve the organisation and its services. (Charities Evaluation Services)
 - In Teacher Education programmes, to what extent is the content knowledge for teaching, and therefore the quality of it, simply taken as given?
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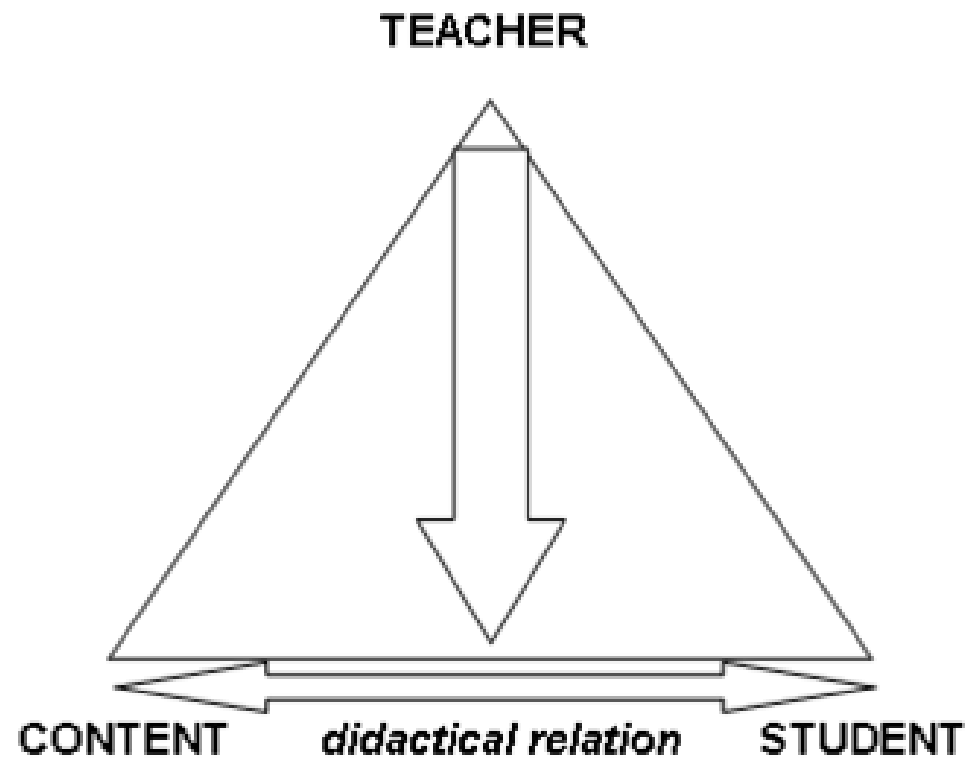
On European traditions of Educational Sciences

- Hudson, B. (2002) Holding complexity and searching for meaning - teaching as reflective practice, *Journal of Curriculum Studies*, 34, 1, 43-57.
 - Hudson, B. (2007) Comparing different traditions of teaching and learning: what can we learn about teaching and learning? *European Educational Research Journal*, Vol. 6, No. 2, 135-146, 2007
 - Conceptual tools and ways of thinking that help to recognise and hold the complexity of teaching-studying-learning processes and which provides a relational framework that places the teacher and content at their heart.
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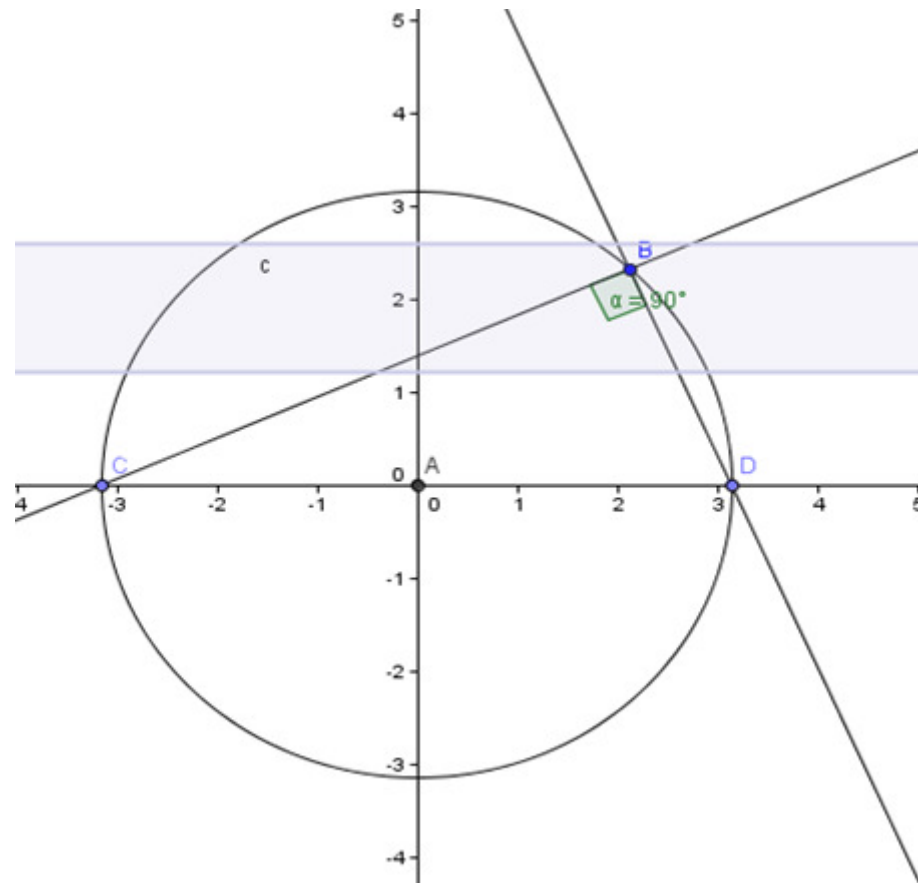
On conceptual tools - the pedagogical relation



On conceptual tools - the didactical relation



Going back to our example live ... what can you see and what can you say now?



On the contested (and distorted) nature of mathematics

- Is it an abstract subject for an elite or should mathematics be for all?
 - *This (deductivist) style starts with a painstakingly stated list of axioms, lemmas and/or definitions. The axioms and definitions often look artificial and mystifyingly complicated. One is never told how these complications arose. The list of axioms and definitions is followed by carefully worded theorems. These are loaded with heavy-going conditions; it seems impossible that anyone should ever have guessed them. The theorem is followed by proof.*
 - Lakatos (1976, p 142)
 - When this is presented in textbooks this product of human activity "alienates itself" (ibid, p146) from the very human activity, which produced it.
 - "dead geometry entombed in text books" (Geoff Giles, 1981)
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On the contested (and distorted) nature of mathematics – in summary

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| <ul style="list-style-type: none">■ Mathematical fundamentalism■ Infallible and authoritarian■ Dogmatic and absolutist■ Irrefutable and certain■ Strict procedures■ Rule following■ Right and wrong answers■ High stakes testing■ Boring■ De-motivating■ Fear and anxiety■ Alienation from the subject itself | <ul style="list-style-type: none">■ Mathematical fallibilism■ Fallible and liberating■ Critical thinking, growth & change■ Refutable and uncertain■ Multiple solutions■ Creative reasoning■ Errors and mistakes■ Evaluation & self assessment■ Engaging■ Motivating■ Enjoyment and fulfilment■ A creative human activity |
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On uncritical assumptions about the nature of mathematics

- **What are the features of effective learning and teaching in mathematics?**
 - From the early stages onwards, children and young people should experience success in mathematics and develop the confidence to take risks, ask questions and explore alternative solutions without fear of being wrong.
 - Through their use of effective questioning and discussion, teachers will use misconceptions and wrong answers as opportunities to improve and deepen children's understanding of mathematical concepts.
 - *Curriculum for Excellence, Mathematics: principles and practice, (p2)*
 - Errors as *intellectual achievements* and mistakes as *practical ones*
 - (Lawrence Stenhouse)
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On the importance of research in and on TE, the role of HE and the place of subject didactics

- **Starting from a case of recent and current studies on teacher education:**
 - Henderson, S. and Rodrigues, S. (2008) Scottish student primary teachers' levels of mathematics competence and confidence for teaching mathematics: Some implications for national qualifications and initial teacher education, *Journal of Education for Teaching*, 34 (2), 93-107.
 - Henderson, S. (2010) *Mathematics Education: The Intertwining of Affect and Cognition*. Unpublished doctoral thesis. D.Ed. University of Dundee.
 - Hudson, B. and Henderson, S. (2010) What is Subject Content Knowledge in Mathematics? On the Implications for Student Teachers' Competence and Confidence in Teaching Mathematics, *Teacher Education Policy in Europe (TEPE) Network Conference*, University of Tallinn, 30th September – 1st October 2010.
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On student teachers' levels of competence and confidence for teaching mathematics

- The findings highlighted that students' subject knowledge was often lacking when assessed using the online assessment.
 - It was also found that those students possessing more advanced mathematics qualifications at SCQF level 6 (SCQF 2003) were less likely to display competence in primary mathematics and that their confidence levels in the subject were lower than their less well qualified peers.
 - ... raising questions about the reliability of entry qualifications as predictors for ensuring sound subject knowledge
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Background context of these studies

- Most mathematics lessons in Scotland still tend to feature some form of teacher-led demonstration followed by children practising skills and procedures from a commercially produced scheme (SEED 2005).
 - According to TIMMS, 72% of both P5 and S2 pupils were taught using a textbook as the primary resource compared to the international average of 65% and 60% respectively. (IEA, 2008)
 - According to the most recent SSA (Scottish Government, 2009), the most common form of activity in mathematics classes in Scotland is based on pupils using textbooks and working quietly on their own
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On the importance of research in TE

- Knowledge that is represented as authoritative, and established independently of scholarly warrant, cannot be knowledge. It is faith. What is unquestionable is unverifiable and unfalsifiable. In contrast our knowledge is questionable, verifiable and differentially secure. Unless our students understand that, what they take from their experience is in error: the error that research yields established authoritative knowledge that cannot be questioned. (Lawrence Stenhouse)
 - ... the aim is that teachers can internalise a research-orientated attitude towards their work” (Hannele Niemi, 2009)
 - Förhållningssätt – “praxis of consideration/attitude towards knowledge” – as a goal of higher education in Sweden
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The role of HE and the place of subject didactics

- “Didactics is not a university discipline in its own right in the English-speaking countries. However, it is firmly rooted in France, Germany, the Nordic countries, Russia, and many other countries in continental Europe.”
 - Hudson, B. and Meyer, M. (2010) (Eds.) *Beyond Fragmentation: Didactics, Learning and Teaching*, Barbara Budrich Publishers. (Work in Progress)
 - Why not subject didactics as university disciplines in their own right?
 - Why not place equal value on research into the teaching and learning of maths as on research into maths itself?
 - Comparative didactics as a newly emerging research field (Florence Lizogat, ECER 2010)
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In conclusion on the theme of QA in TE through the lens of didactics – learning and teaching

- A main argument is that the content of TE needs to be research-based, to include a focus on the epistemological foundations of subject knowledge and to address the contested nature of such
 - QA processes at the national level have a pivotal role to play in terms of setting the necessary standards required of teachers in terms of content knowledge for teaching.
 - QA processes at the institutional level have a vital role to play in achieving the necessary standards as learning outcomes in terms of content knowledge for teaching.
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Questions arising

- What are the necessary standards required of teachers in terms of content knowledge for teaching?
 - What are some of the possible implications for teacher educators of any changes in the standards required of teachers in terms of content knowledge for teaching?
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Knowledge and understanding SCQF Level 10

Honours degrees

- Knowledge that covers and integrates most of the principal areas, features, boundaries, terminology and conventions of a subject/discipline
 - A critical understanding of the principal theories, concepts and principles
 - Detailed knowledge and understanding of one or more specialisms, some of which is informed by or at the forefront of a subject/discipline
 - Knowledge and understanding of the ways in which the subject/discipline is developed, including a range of established techniques of enquiry or research methodologies
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Knowledge and understanding SCQF Level 11

Masters

- Knowledge that covers and integrates most, **if not all**, of the main areas of a subject/discipline including their features, boundaries, terminology and conventions
 - A critical understanding of the principal theories, concepts and principles
 - **A critical understanding of a range of specialised theories, principles and concepts**
 - **Extensive**, detailed and **critical** knowledge and understanding of one or more specialisms, **much** of which is informed by or at the forefront of a subject/discipline
 - **Critical awareness of current issues in a subject/discipline and one or more specialisms**
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