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# Developing Subject Knowledge in Initial Teacher Education

Kathryn Fox: University of Cumbria, Lancaster

Ruth Hurst: University of Cumbria, Lancaster

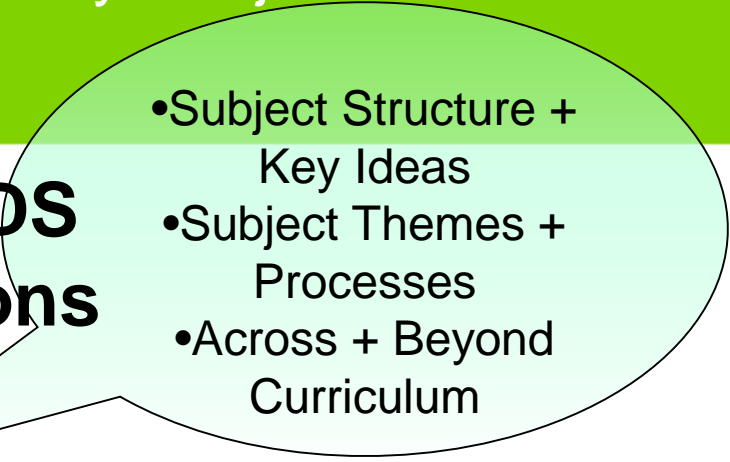
Nigel Appleton: Bishop Grosseteste University College, Lincoln



# Developing a Course for 21<sup>st</sup> Century Subject Specialists: Considerations

## **IDEAS, THOUGHTS & NEEDS** **Pre-Validation Considerations**

- Link subject knowledge to themes
- Links with the Secondary Curriculum
- Forge links with partnership schools

- 
- Subject Structure + Key Ideas
  - Subject Themes + Processes
  - Across + Beyond Curriculum

# • Personalised

# Developing a Course for 21<sup>st</sup> Century Subject Specialists: Considerations

Placements are viewed by the students as one of the most important parts of their development as a teacher  
(Challen 2006)

Maths: Peer mentoring 1:1  
ICT: BBC School News Report

David Beckham speaks to School Report



This year a school interviewed David Beckham

Strictly Come Dancing in Blackpool





# Developing a Course for 21<sup>st</sup> Century Subject Specialists: Theoretical Perspectives

How has the school engagement helped you:

It has helped me now whilst on placement, as I feel I am already familiar with the types of topics being covered by different year groups, and areas such as APP and ICT levels are more clearer



# Developing a Course for 21<sup>st</sup> Century Subject Specialists: Theoretical Perspectives

Not starting from scratch:

- Two year PGCEs (latterly 1+1)
- Physics and Chemistry Enhancement Courses (6 month)
- BA/BSc with QTS in some secondary subjects (3 years)
- Short subject knowledge booster courses (2 weeks)



# Developing a Course for 21<sup>st</sup> Century Subject Specialists: Theoretical Perspectives

Differing perspectives in the courses:

- Advanced perspective at degree level on the school curriculum subject, levels 5 and 6 (2yr PG, yr1)
- In-depth knowledge of the subject at levels 2 and 3 (CEC, PEC)
- Combining degree level study of subject, education and subject education (SecUG)





# Developing a Course for 21<sup>st</sup> Century Subject Specialists: Theoretical Perspectives

What is the subject knowledge these students need?

- Elementary Mathematics from an Advanced Standpoint; Professor Felix Klein (1908)
- Advanced Mathematics from an Elementary Standpoint; M. R. Spiegel (1950); W. W. Sawyer (1950s and 60s)

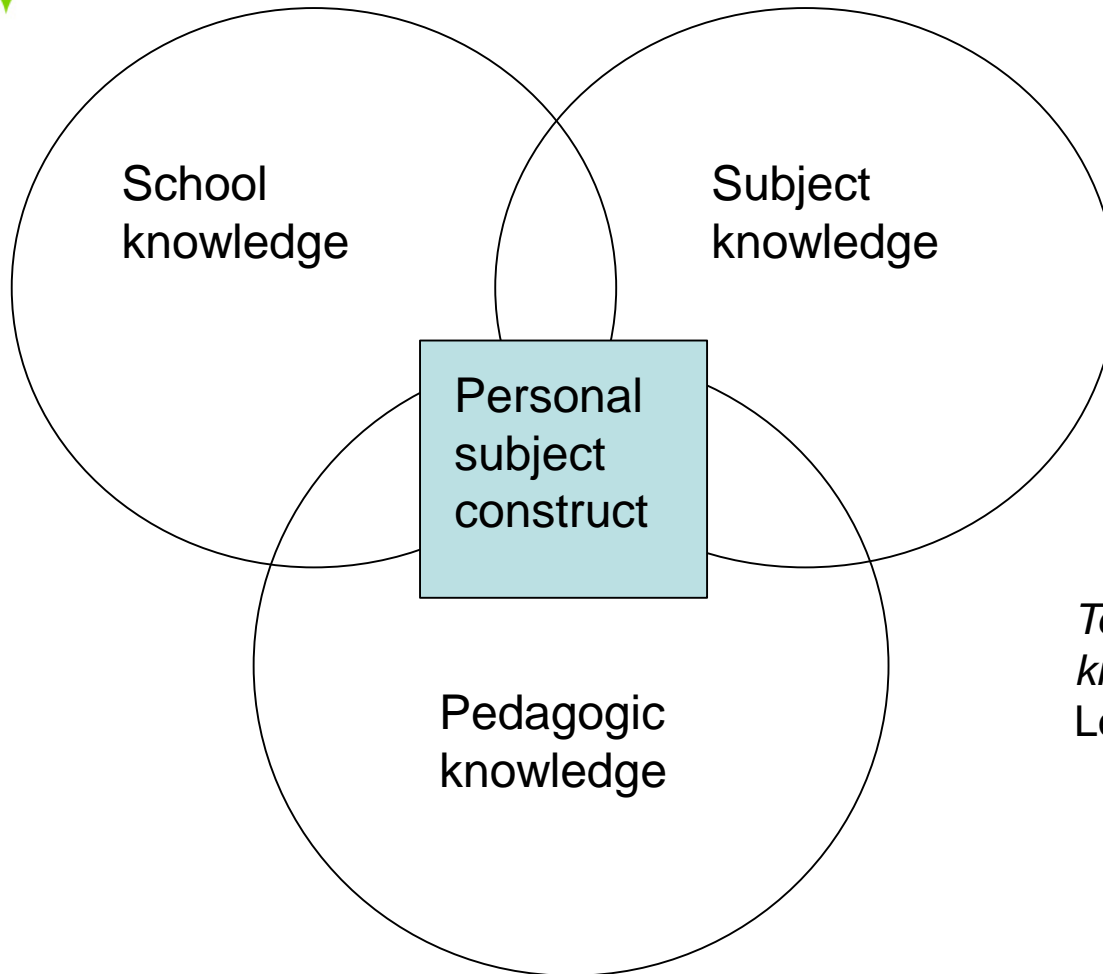
Subject or pedagogy?

- Q14 (exit requirement):

**Have a secure knowledge and understanding of their subjects/curriculum areas and related pedagogy to enable them to teach effectively across the age and ability range for which they are trained.**

- Pedagogical Content Knowledge; Shulman (1986, ...)

# Developing a Course for 21<sup>st</sup> Century Subject Specialists: Theoretical Perspectives



*Teachers' professional knowledge from Banks, Leach & Moon (2005)*



# Developing a Course for 21<sup>st</sup> Century Subject Specialists: Theoretical Perspectives

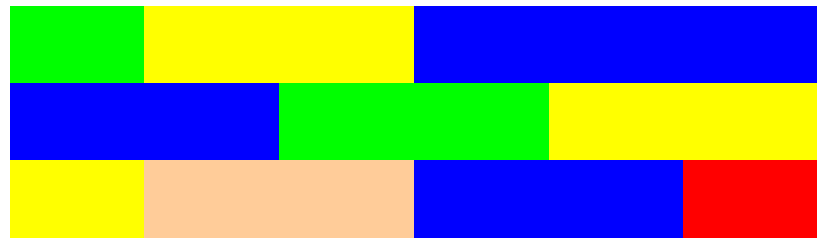
Deep and surface approaches to learning; Biggs (1999, 2003)

Student perceptions of what they know and what they need to know; eg Kempe (2009); Green (2006)

Effectiveness of subject knowledge enhancement courses; eg May et al (2008); Woolhouse & Cochrane (2009)



# Subject Knowledge Enhancement or 'engaging with more than just the subject matter'.



*Tracked and assessed through S portfolio tracking system.*

- Basic tier varies depending on individual and subject needs.

# Subject Knowledge Enhancement or 'engaging with more than just the subject matter'.



} *Tracked and assessed through the University module system.*

} *Tracked and assessed through S portfolio tracking system.*

- Basic tier varies depending on individual and subject needs.
- Three overarching modules:
  - Subject Structure and Key Ideas
  - Subject Themes and processes
  - Subject Across and Beyond The Curriculum
- Basic and second tier learning are usually be interwoven.

# Case Studies: Raising Awareness of Subject Structures



SKE Portfolio - Kath



Subject Knowledge  
Enhancement ICT

SKE 6001 Subject Structure  
and Key Ideas

SKE 6002 Subject Themes  
and Processes

SKE 6003 Subject Across and  
Beyond the Curriculum

Computer Systems

Data Communications &  
Networks

Database Design

Multimedia 1: Designing and  
Evaluating Learning Materials

Systems Analysis

Web Technologies 1 (Web  
Design)

## Digital Literacy: Graphic & Animation

### **Prior Knowledge before this Module:**

Before this module I had a little knowledge of some of the software packages used. The previous unit on creating Learning resources had introduced me to Flash at the deep end. This unit gave me some of the basics that I had missed previously and therefore increased my skills. I had only used photoshop on a very limited basis before and so my confidence is improved with this package. We had covered various file types and file sizes of images in Computer systems and Web Technologies 1 so again this was revisiting and consolidating my learning in this area. I did feel very confident with using Publisher as I have used this on many occasions over a number of years to create posters, newsletters and certificates.

### **My Learning Journey:**

Session 1: This commenced with an introduction to visual literacy and as a group we looked at many sources of artwork and analysed the use of colour and contrast in a number of paintings. The types of colours used together created different moods and how a colour wheel can be used to help pupils choose which colours are effective together. The task we did was aimed at Y7's to get them familiar with the Adobe Photoshop user interface and tools. We chose a picture which had good contrasting colours in it, this was imported to photoshop and pixelated. From this version of the photo we chose the main colours and created a palette of these at the side of the canvas the photograph was then



# Developing a Course for 21<sup>st</sup> Century Subject Specialists: Theoretical Perspectives

direct involvement by students in assessing and discussing their own work and being given the opportunity to reflect on goals, strategies and outcomes are highly effective in enhancing learning and achievement.

McDonald and Boud, (2003)



# Case Studies: Raising Awareness of Subject Structures

*“The links to the curriculum has been invaluable this year. There is little time on the PGCE to go into great depth but this section of 6001 has left me far better prepared and therefore helps me with lesson planning now.”*

*“I definitely feel more confident about the supporting frameworks for teaching my subject”*

*“I developed a better understanding of the national curriculum and the connections in mathematics.”*

From students who undertook SKE and are currently on PGCE courses.



# Subject Knowledge Enhancement: Evaluating the Impact

How has the SKE course impacted upon outcomes ...?

trainees' classroom practice?

trainees' attitudes to their subject knowledge development?

trainees' understanding of the subject structure, key processes and the subject across and beyond the curriculum?



# Subject Knowledge Enhancement: Discussion Questions

- How might following the SKE course impact upon trainees' attitudes to their subject knowledge?
- How could trainees' attitudes to subject knowledge impact upon their classroom practice?
- How might we further develop our understanding of the impact of the SKE on classroom practice and where are the opportunities to assess the impact of the SKE on outcomes for trainees?



# Developing Subject Knowledge in Initial Teacher Education

Thank You!