

Subject Knowledge in D&T Teacher Education: Exploring the gaps

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Background

- D&T as a subject has historically seen many changes
- Practice in schools is wide and varied from both what we see from first-hand experience on visits as part of our PGCE course and what we read and hear in from expert colleagues, articles and so forth
- Breadth of subject – working with materials that include food, textiles, computational systems, engineered materials etc
- Consequent broad range of student backgrounds – lots of depth but little breadth
- Topic of D&T in schools has been made more challenging due to curriculum changes, new National Curriculum in England in 2014, new GCSE specification for D&T first examined in 2019 (formerly Product Design; Textiles Technology; Resistant Materials; Graphic Products; Electronic Products and Systems and Control) and Food Preparation and Nutrition (FPN) in first examined in 2018
- Subject knowledge became a much bigger focus
- Students arrive with narrow depth; need to add shallow breadth ('T shaped')

Dealing with Subject Knowledge

- PGCE different backgrounds/specialisms prior to PGCE and adding breadth, Subject Knowledge Enhancement (SKE) Courses or not and variation, constraints of time to “ cover” SK on the course
- National Curriculum: KS1-3 (D&T and FPN precursors)
- GCSE specifications – different examination boards, range of different courses
 - GCSEs: Design and Technology, Engineering, Food preparation and Nutrition
 - Vocational courses include Hospitality and Catering, Child Development, Engineering Design, Engineering Manufacture, Health & Social care.....
- Expectations of, and practice in, schools
- Experience and background of practising teachers such as non-specialist teachers teaching D&T and D&T teachers teaching beyond the subject

What constitutes a reasonable foundation of subject knowledge that gives our partner schools a platform to build on?

Our starting point!

What was key was that we needed to consult both our partnership schools and our student teachers



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What we did

- Created four different surveys using Microsoft forms
- sent to :
 - our current PGCE students asking how well prepared they felt for their placements in terms of their levels of subject knowledge.
 - former students from last four years
 - current subject mentors
 - former subject mentors from last four years.

KS3 content (current students and mentors)	Content taught by PGCE students (n=11)	Content offered by the school (n=16)
CAD	3	12
Electronics	2	11
Engineering	0	9
Food & Nutrition	8	14
Graphics	2	10
Hospitality and catering	1	4
Mechanisms	2	5
Metals	1	8
Plastics	1	11
Product Design	2	12
Structures	1	7
Textiles within art	3	4
Textiles within D&T	7	15
Timbers	2	13
Other	0	2


Findings

KS3 content (previous students and mentors)	Content taught by previous students (n=31)	Content offered by the school (n=9)
CAD	15	7
Electronics	10	5
Engineering	8	2
Food & Nutrition	20	8
Graphics	14	6
Hospitality and catering	4	2
Mechanisms	8	3
Metals	11	5
Plastics	16	7
Product Design	18	8
Structures	3	4
Textiles within art	4	0
Textiles within D&T	15	6
Timbers	18	8
Other	4	3

Findings

KS4 content (current students and mentors)	KS4 courses taught by PGCE students (n=11)	KS4 courses offered by the school (n=16)
GCSE Design and Technology	5	13
GCSE Engineering	0	1
GCSE Food Preparation and Nutrition	5	14
GCSE Art and Design	1	10
Level 1/2 Engineering	0	7
Level 1/2 Health and Social Care	0	6
Level 1/2 Hospitality and Catering	2	5
Other	0	7

Findings

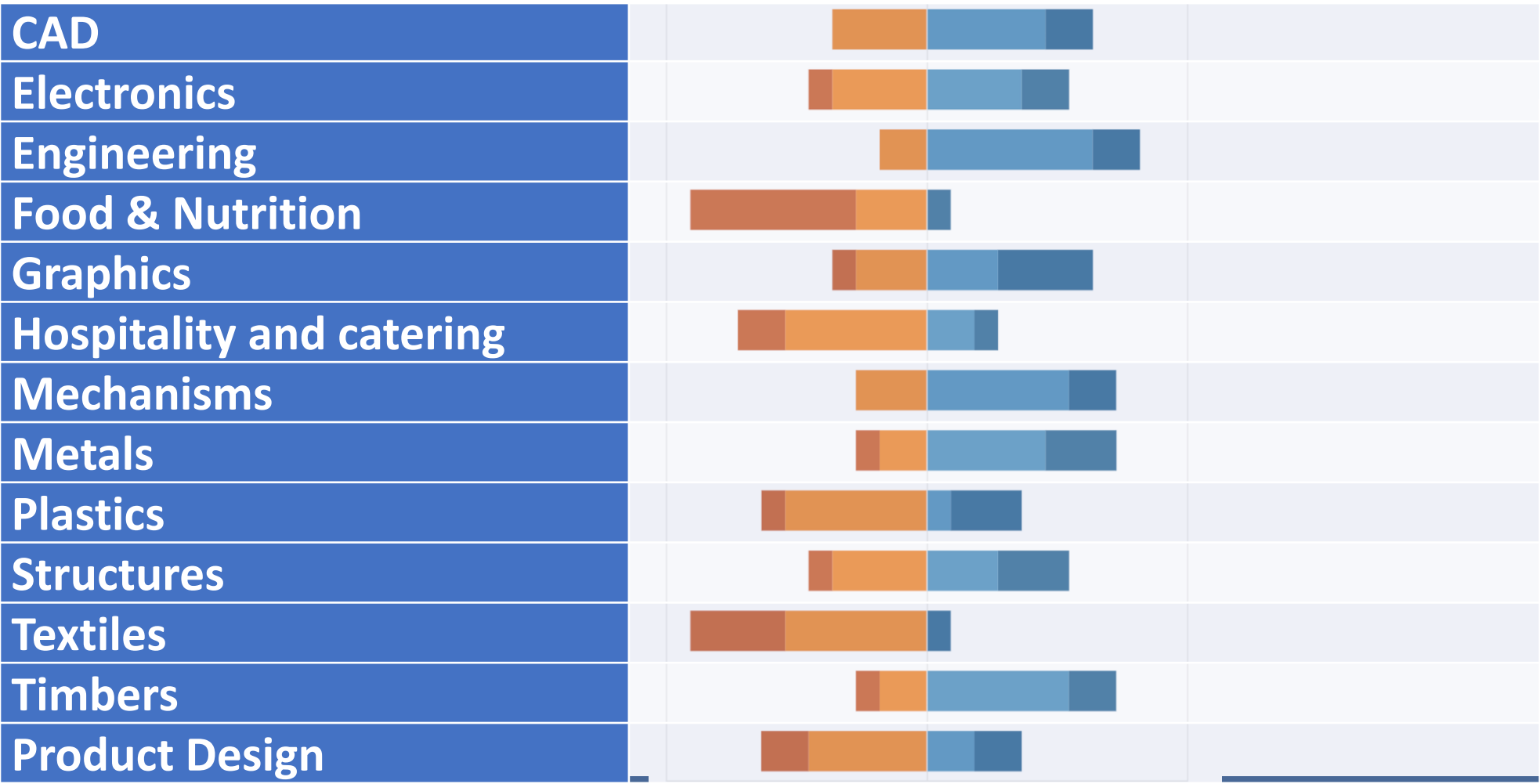
KS4 content (previous students and mentors)	KS4 courses taught by previous students (n=31)	KS4 courses offered by previous mentors' schools (n=9)	Findings
GCSE Design and Technology	15	8	
GCSE Engineering	2	0	
GCSE Food Preparation and Nutrition	14	6	
GCSE Art and Design	6	1	
Level 1/2 Engineering	3	1	
Level 1/2 Health and Social Care	3	1	
Level 1/2 Hospitality and Catering	3	2	
Other	7	4	

Findings

'Other' KS4 courses (previous students and mentors)	student	school
Level 1/2 Construction	1	2
NCFE Level 1/2 Graphic design	1	
GCSE Photography	2	
Vcert Food and Cookery	1	
IGCSE Cambridge Food and Nutrition	1	
WJEC level 1/2 Constructing the Built Environment	1	
GCSE Design and Technology Textiles		2
GCSE D and T Graphics		1
BTEC Award Art and Design		1
Level 1/2 (vocational) Creative Design and Production		1

Usefulness of course subject knowledge (current students)

Findings



■ extremely useful
 ■ quite useful
 ■ not very useful
 ■ not at all useful

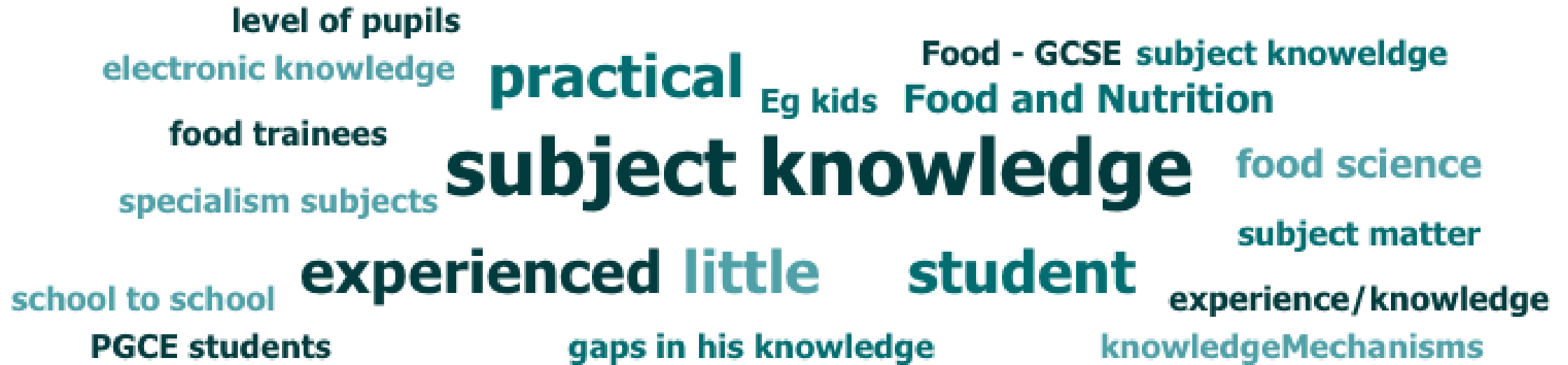
*Summary of subject knowledge gaps noted (**current** students)*

observations and discussion KS3 level food science Textiles and food areas
food and nutrition **food** **Textiles** different
subject knowledge knowledge lot of stuff **Electronics** nice **gaps** materials and electronics
SKE Textiles degree science and nutrition independent study

*Summary of subject knowledge developed on placement (**current** students)*

Professional behaviours opportunity Woodworking
subject specialism life skills new knowledge beginning
periods
Generally picking **food and nutrition** tutor classes
form specialism of Textiles **placement** lot
course useful information curriculum

*Summary of subject knowledge gaps noted (**current** mentors)*



*More University emphasis requested (**current** mentors)*

- Sustainability
- Photography
- More Textiles knowledge e.g. sources of fibres and how to use a sewing machine
- Practical metal working experience.
- More advanced woodworking skills e.g. dovetail joints, operation of a wood lathe
- Use of CAM and systems and control
- More graphics

Concluding thoughts

Issues arising include:

- Preparation for students' specific placements vs preparation for first jobs.
- Preparation for the most taught D&T subject areas in schools vs introduction to topics (such as physical computing) that are important but poorly represented in many schools' curricula.
- Preparation for the 'core' subjects of D&T and FP&N while also acknowledging the wide range of vocational courses that D&T departments can be required to teach.
- Teaching D&T and FP&N; these areas are, in many schools and increasingly, being taught as separate subjects.
- Teaching Textiles in D&T vs Textiles in Art & Design

Next steps ..

- Updated our subject knowledge portfolio based on feedback from the students
- Evaluated our current taught subject knowledge content
- Provide more detailed communication between PGCE and subject mentors, allowing for the sharing of views and shared planning of content that leads ultimately to a clearer understanding of the shared responsibility for subject knowledge development.
- Planning for our own Subject Mentor training for next year:
 - what the expectations are in terms of SK
 - Demands arising from new PGCE structure
 - Ofsted focus on subject mentors' shared understandings

Q & A

