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# Pedagogy by proxy: developing computing PCK through shared lesson resources

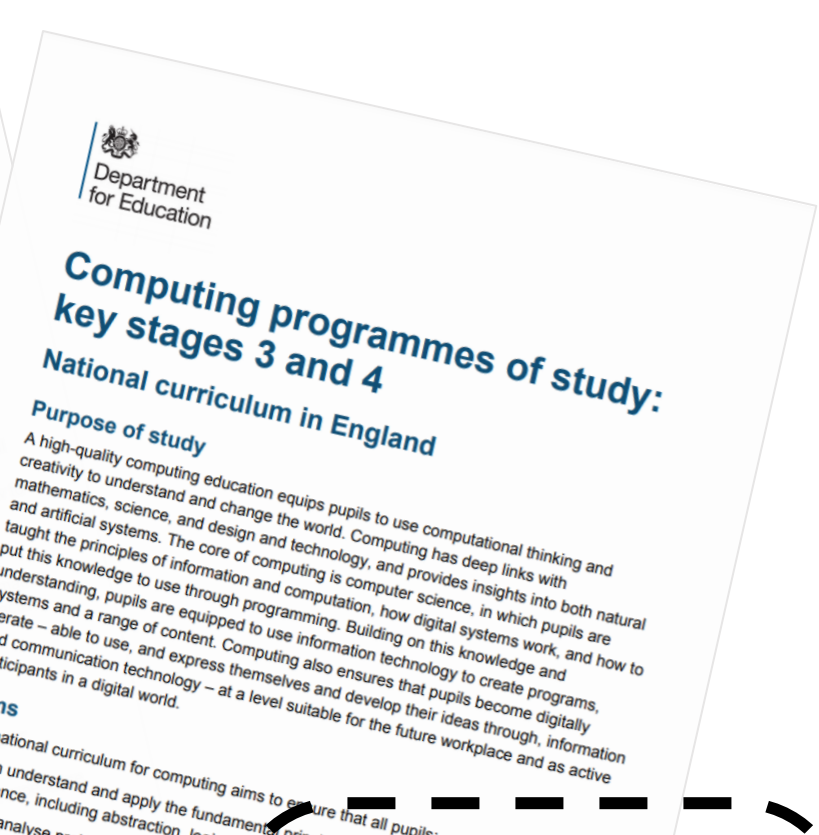
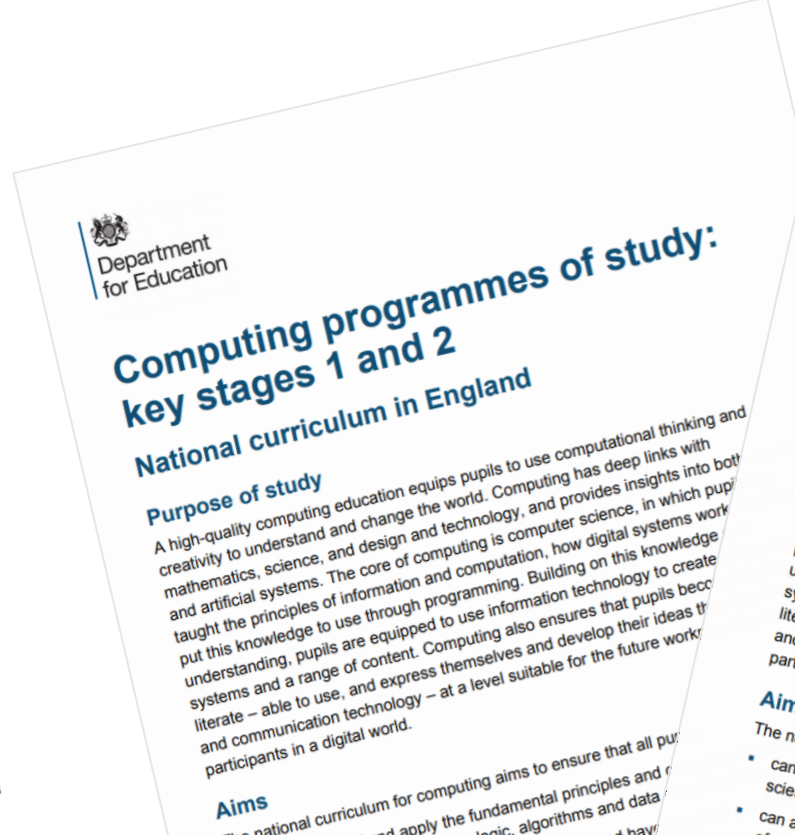
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**University of  
Sunderland**



**IT**  
Information  
Technology

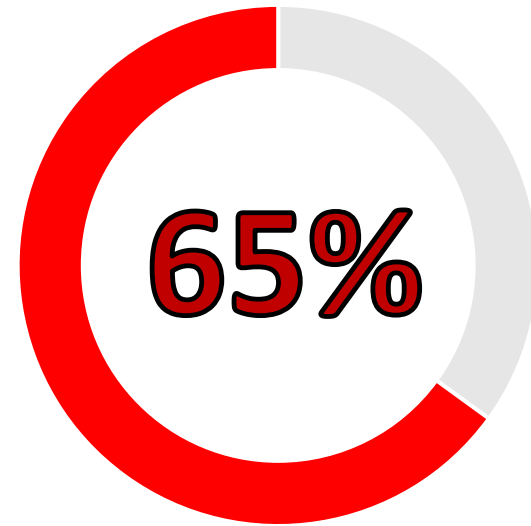
**DL**  
Digital  
Literacy

**CS**  
Computer  
Science

# How do these teachers know how to teach CS?



Do not have a relevant first degree and teacher training qualification to teach ICT



Source: Royal Society  
2012, p. 71-72

# Video-calling and desktop-sharing (Hidson, 2020)



# Communities of practice: 'anytime, anywhere personal learning networks' (Trust, 2016)

- Internet searching as a starting point
- Online sharing platforms
- CAS – face-to-face and online
- Commercial and 'cottage industry' providers
- Programming reference sites



# Teaching materials

1. **Bespoke** lesson resources, created by teachers for a specific purpose
2. **Gathered**, unmodified resources located and used with little or no change
3. **Repurposed** lesson resources, gathered and modified by the teacher to fit their lesson objectives more effectively



*Representation of Shulman's (1986) three categories of teacher knowledge*

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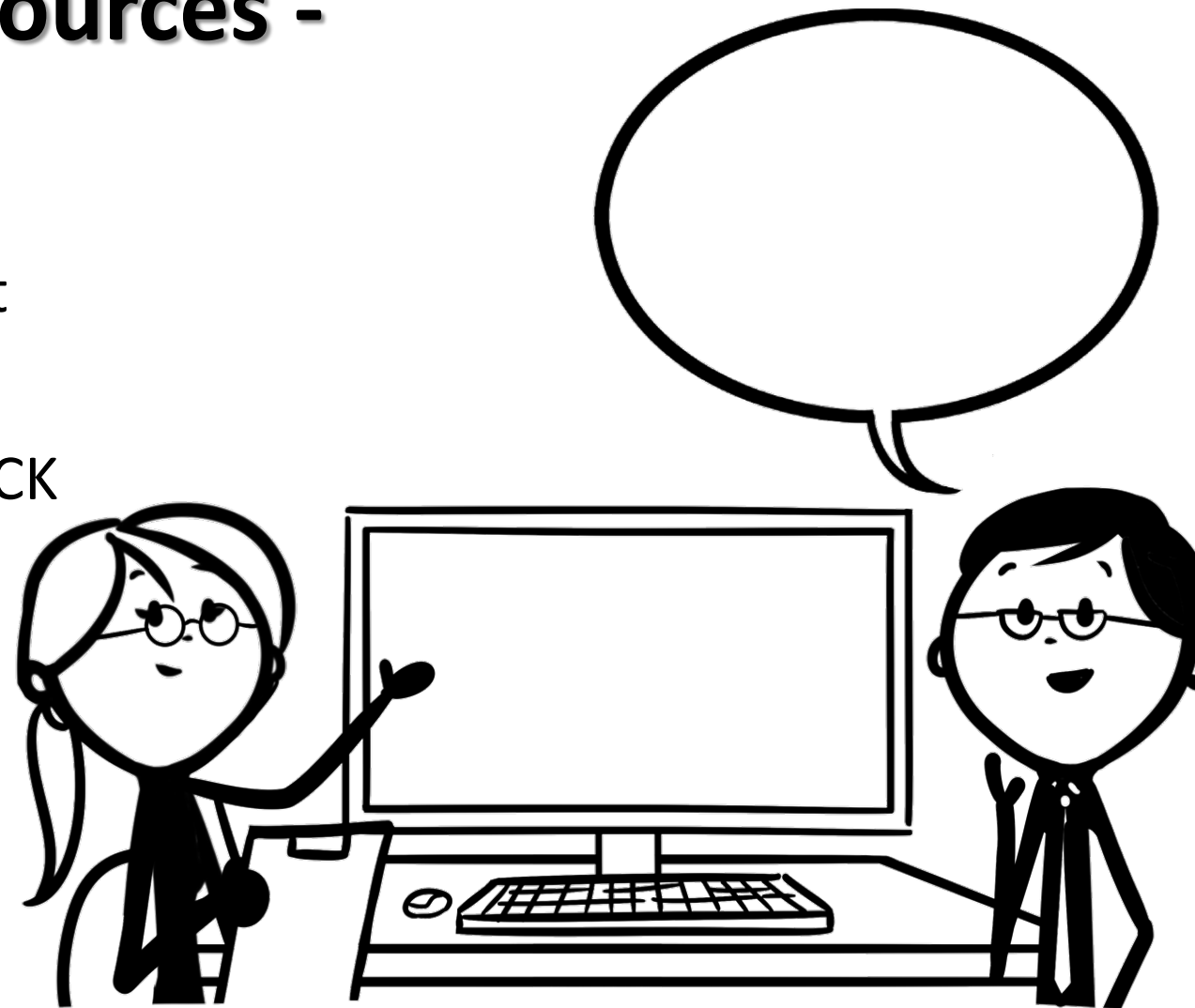
<b>Subject Matter Content Knowledge</b>	<b>Pedagogical Content Knowledge (PCK)</b>	<b>Curricular Knowledge</b>
The amount and the organization of knowledge in the mind of the teacher	Subject matter <i>for teaching</i> Aspects of content most germane to its <i>teachability</i> Representations: analogies, illustrations, examples, explanations, demonstrations	[educational] programs designed to teach particular subjects and topics
Content can be represented and theorised in various ways		Instructional materials: texts, software, programs, visual materials, films, demonstrations etc.
The teacher's subject matter content understanding in relation to the discipline	Understanding of what makes the learning of specific topics easy or difficult	Understanding of the characteristics of the materials

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# The educative role of resources - PCK by proxy

- The unheard commentary that is part of any shared lesson resource
- This meta-information is the key to PCK
- A state of *transitional* pedagogical reasoning – scaffolded by a more knowledgeable other
- External knowledge validation – resources and support

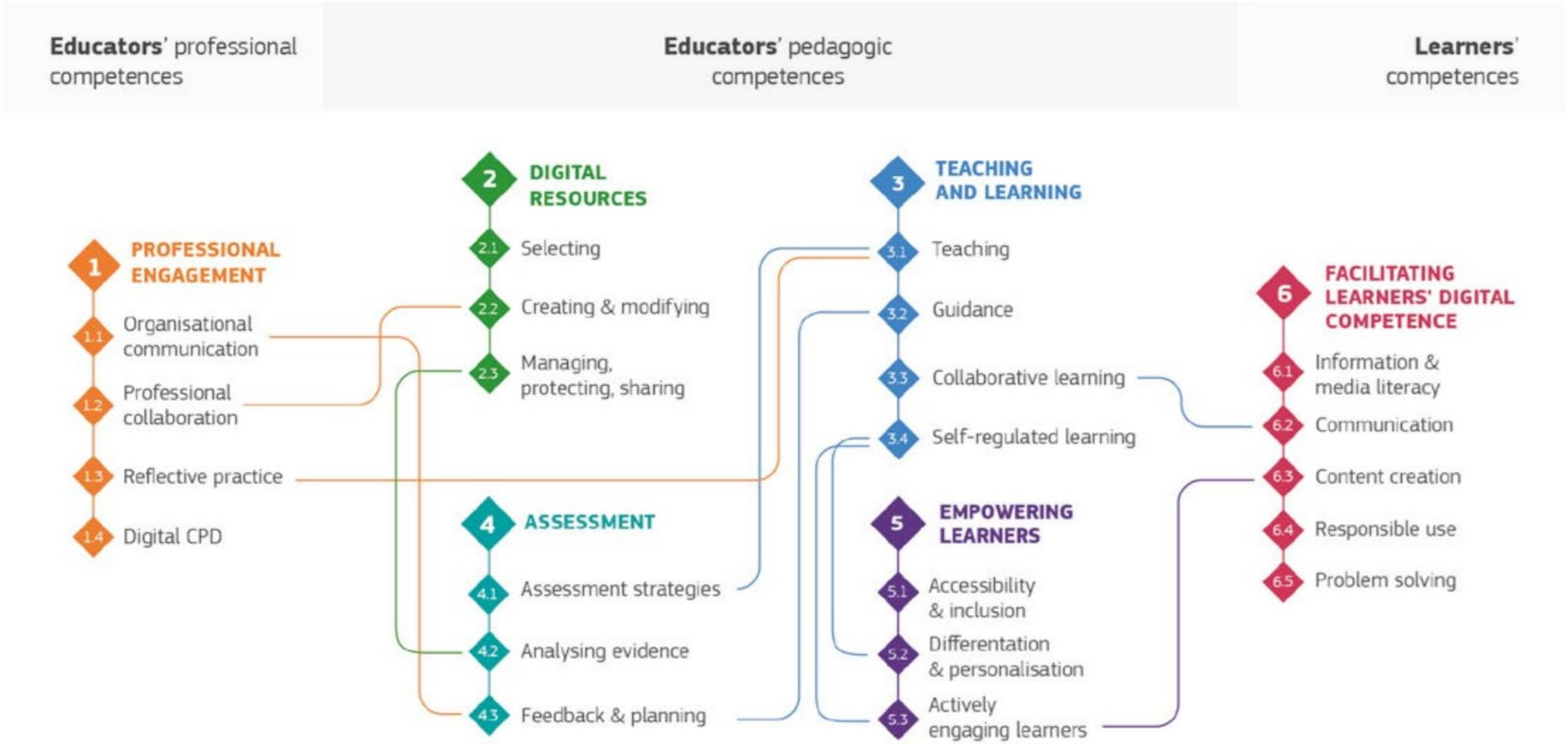


**But weren't these just very  
tech-savvy teachers?!**



**ALL teachers need digital  
competence**





European framework for the digital competence of educators:  
 DigCompEdu - competences and their connections (Redecker, 2017, p. 16)

# Digital Resources



## Selecting digital resources

To identify, assess and select digital resources for teaching and learning. To consider the specific learning objective, context, pedagogical approach, and learner group, when selecting digital resources and planning their use.



## Creating and modifying digital resources

To modify and build on existing openly-licensed resources and other resources where this is permitted. To create or co-create new digital educational resources. To consider the specific learning objective, context, pedagogical approach, and learner group, when designing digital resources and planning their use.



## Managing, protecting and sharing digital resources

To organise digital content and make it available to learners, parents and other educators. To effectively protect sensitive digital content. To respect and correctly apply privacy and copyright rules. To understand the use and creation of open licenses and open educational resources, including their proper attribution.

TABLE 2: AREA 2 - DIGITAL RESOURCES

(Redecker, 2017, p. 20)

# Implications for teacher education

- **Digital competence with a clear focus on pedagogical reasoning as part of all initial teacher education and agile professional development**
- Acknowledge and teach pedagogical reasoning and PCK
  - Know what you need to be able to teach
  - Know how to find it, and where
  - Know how to re/purpose it
  - Know how to teach with it (teachability → PCK)



Pedagogy by proxy: teachers' digital competence with crowd-sourced lesson resources



# References

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