# Facing the future right now:
## PGCE trainees' classroom action research into EdTech and Computing

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# The international initial teacher training (IITT) context


- 25,000 schools in total in the UK → half a million teachers → 9 million pupils
- Over 13,180 English-medium international schools → 571,228 teaching staff → 5.8 million pupils
- Around 6481 British-oriented international schools → 282,600 staff → 2.9 million pupils

Statistics from GOV.UK and ISC Research (2022)

# PGCE → four modules → 120 credits

**TEACHING EXPERIENCE**

**SUBJECT STUDIES**

**CASE STUDY**

**ACTION RESEARCH**

# PGCE action research

- Right **here**, right **now**
- **Local** insights and context are vital
- What **bothers** you in your classroom?
- What **steps** can you take to explore it further?
- What **impact** does **what practice** over **how long** have on **what outcomes** for **whom**, and **how do you know**?

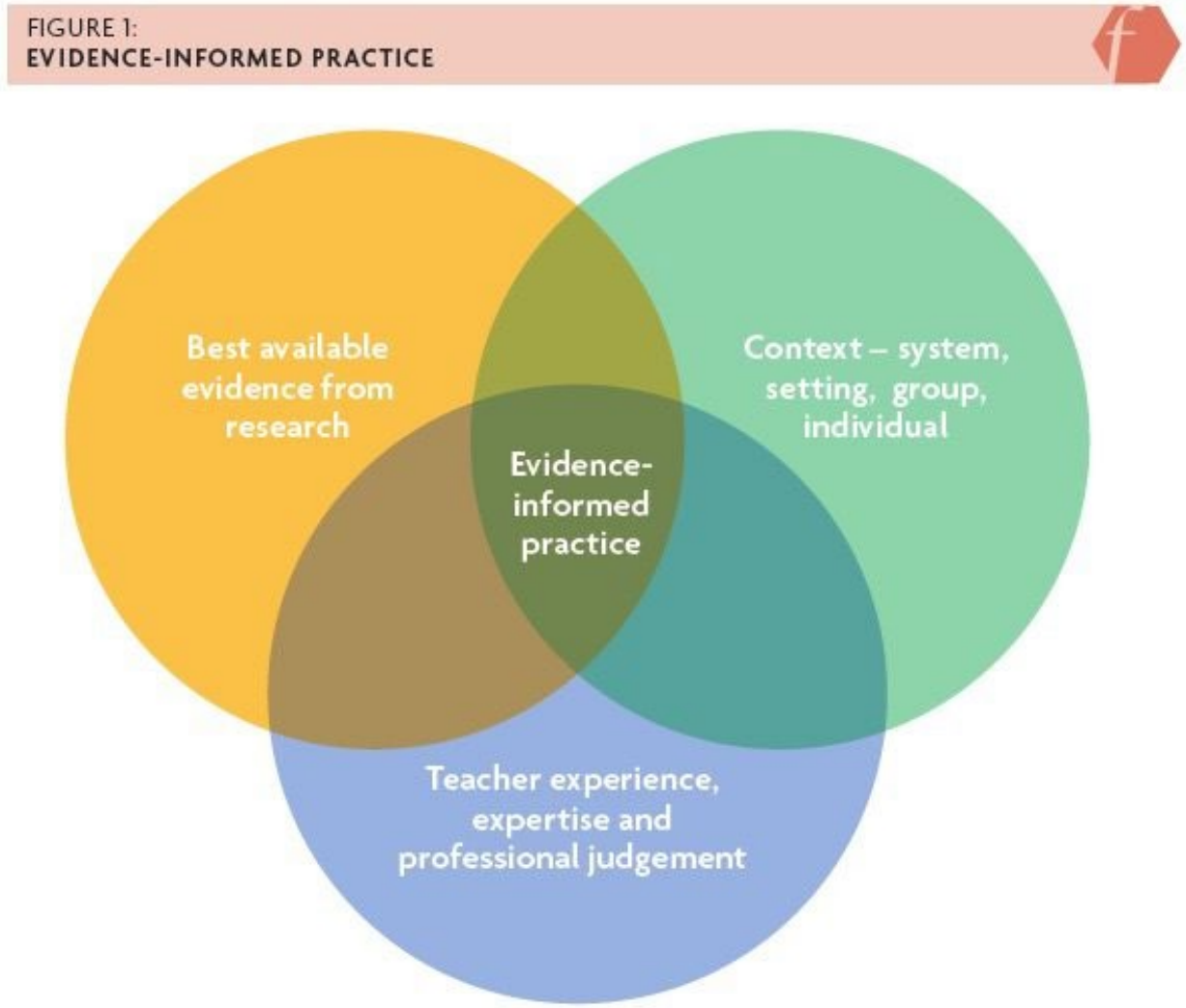



*Figure adapted from Scutt (2018)*

**No matter how great an idea is in principle,**

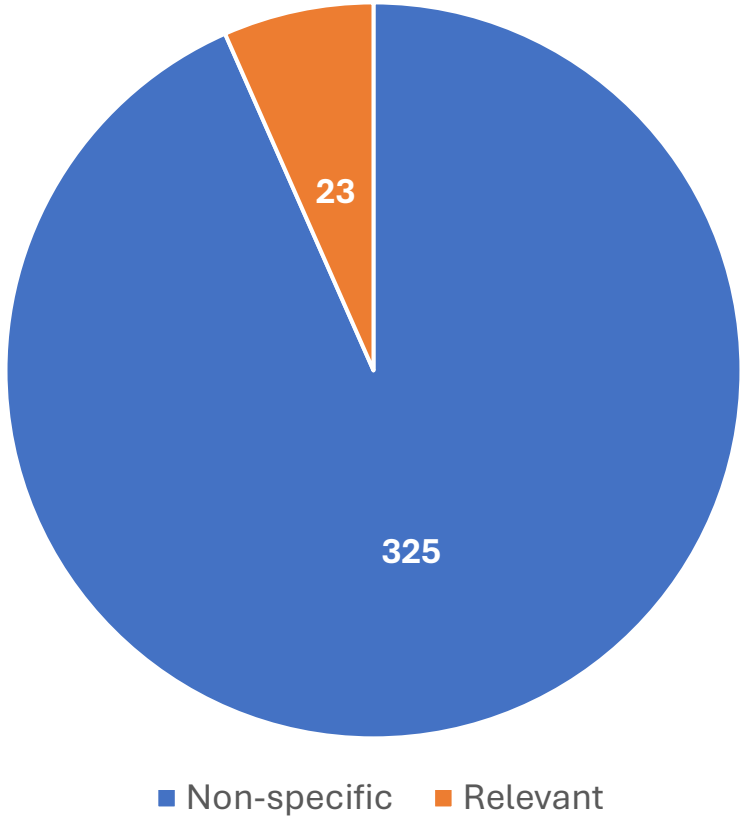
**“what really matters is how it manifests itself in the day–to–day work of people in schools”**

(Sharples et al., 2019, p. 3)

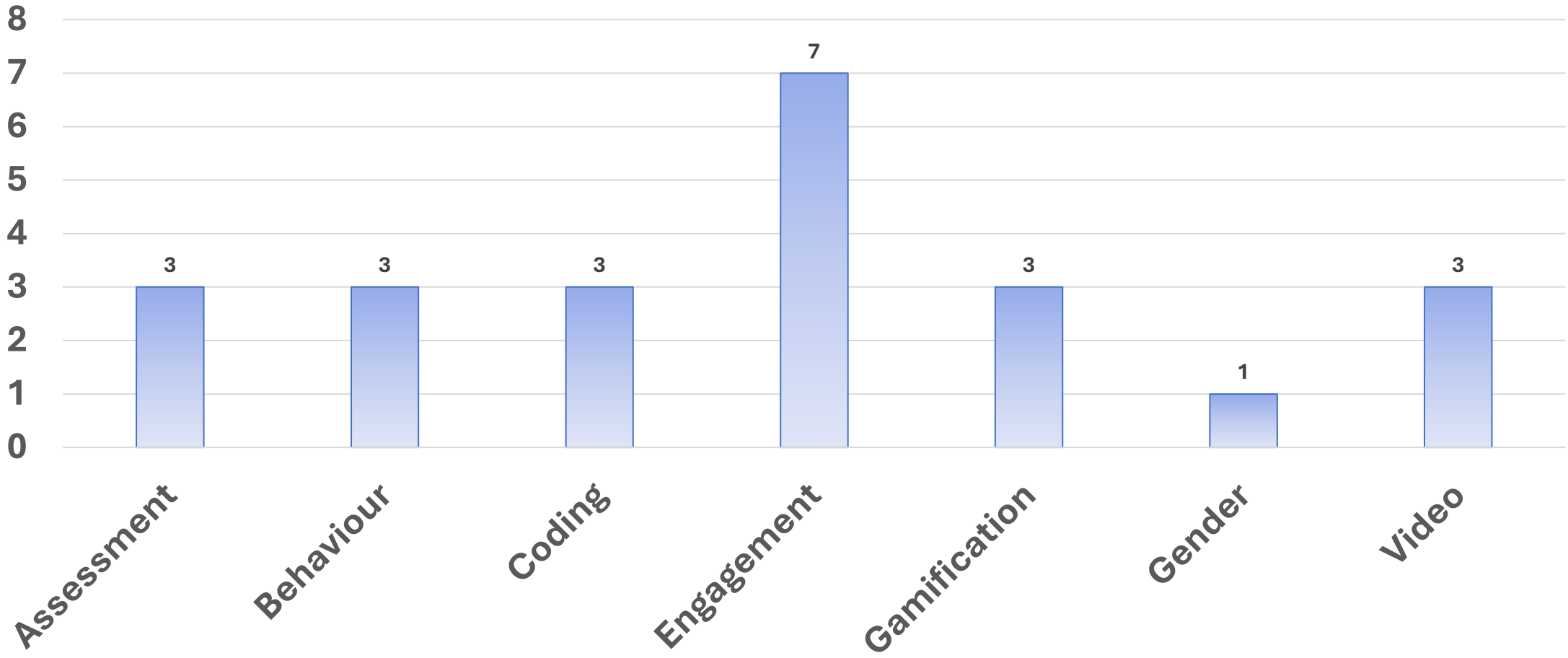
# What EdTech/computing topics do PGCE trainees choose to explore for classroom-focused action research projects?

# PGCE Education Action Research Module

- 348 assignments submitted Sem 2 23/24
- 325 not specific to the computing or EdTech research question (93.4%)
- 23 relevant to the question (6.6%)



# Count of relevant computing/EdTech topics



# “iPADs as a tool of formative assessment in Physical Education”

# Using technology for assessment

**The study explores how to effectively integrate iPads as a tool for formative assessment in physical education, specifically in swimming lessons. The challenge was to use technology to improve students' ability to self-assess and enhance their swimming techniques.**

**Summary:** The research was conducted over three weeks with 12 Year 6 students. It used an action research approach with three cycles. The study collected quantitative data on stroke counts and qualitative data through field notes and teacher interviews. It compared student self-assessments with teacher assessments to gauge improvement in self-assessment accuracy.

- 1. Traditional self-assessment using forms without technology
- 2. Introducing iPads for video recording and playback of students' swims
- 3. Adding professional athlete example videos for comparison alongside iPad recordings

**Three key concerns** about technology in this context:

- 1. Potential for technology to be a distraction or limit student interest and participation
- 2. The risk of using technology for convenience or novelty rather than pedagogical purpose
- 3. Ensuring equitable access to devices for all students

# “The impact of implementing ClassDojo with Year 4 pupils”

# Technology for managing learning behaviour

**The study explores the effectiveness of using ClassDojo, an educational technology tool that gamifies classroom management through a points system, as a sustainable solution for managing disruptive behaviour in the classroom.**

**Summary:** The research was conducted over 3 weeks with 25 Year 4 students. It used an action research approach with three cycles:

- 1. Implementation of ClassDojo with a class goal of 200 points for golden time reward
- 2. Introduction of table points alongside individual points
- 3. Focus on positive actions and specific praise, with less emphasis on negative actions
- The study collected both qualitative and quantitative data through field notes, ClassDojo behaviour reports, and staff questionnaires.

Three key concerns about technology in this context:

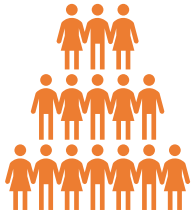
- 1. The potential for technology to make students dependent on external rewards rather than developing intrinsic motivation
- 2. The risk of technology encouraging behaviour that may cease once rewards are withdrawn
- 3. The complexity of human behaviour may be beyond the grasp of current technology, requiring skilled teacher intervention alongside technological tools

# "Evaluating the effectiveness of adopting Pattern-Oriented Instructions Pedagogy with the Coding Platform (Code.org) in the coding education curriculum in Grade 5"

# Teaching coding in primary

**The main problem is the challenge of effectively teaching coding to primary school students given large class sizes and the difficulty of providing individual attention. Some teachers resort to providing sample code for students to copy, which may lead to students not truly understanding the coding concepts.**

**Summary**: The trainee conducted a 4-week action research study implementing the Code.org platform in Grade 5 computer lessons.



- They used Pattern-Oriented Instruction (POI) pedagogy and assigned specific coding tasks each week.
- Data was collected through teacher observations and analysis of students' work saved in digital folders.

**Three key concerns** the trainee had about technology in this context:

1. Students might copy code without understanding it when given sample code to reference.
2. Teachers may struggle to monitor individual progress and provide personalized support in large classes.
3. Traditional coding instruction methods may not effectively engage students or foster independent problem-solving skills.

# "Can differentiated tablet-based maths activities effectively support, challenge, and engage students in a Year 2 classroom?"

# Using technology for engagement

**The main problem was disengagement among both low-achieving (LA) and high-achieving (HA) students when practicing maths fact fluency problems using a one-size-fits-all approach. The trainee wanted to explore if using differentiated tablet-based math activities could better support, challenge, and engage students of different ability levels.**

**Summary**: The trainee conducted a 6-week action research study in a Year 2 maths class, using two cycles. They implemented differentiated math activities using educational apps on tablets, tailoring content to student ability levels. Data was collected through classroom observations, colleague observations, researcher field notes, and student test results.

**Three key concerns** about technology in this context:

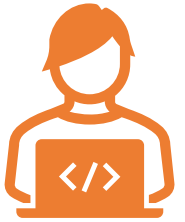
- 1. Potential for students to become overly reliant on extrinsic motivators (e.g. gamification elements) rather than developing intrinsic motivation.
- 2. Risk of students rushing through tasks just to access more engaging app features, potentially compromising learning quality.
- 3. Possibility of technology causing distractions or off-task behaviour if not properly implemented and monitored.

# Gamification across the curriculum

# "Can gamification in mathematics lessons improve student discipline?"

**The main problem is the misuse of iPads by students during class. The trainee found that students often abuse the privilege of having iPads for e-learning purposes by watching irrelevant content or playing games if left unmonitored.**

**Summary:** The research undertaken was an action research study conducted over 3 weeks with a Secondary 1 mathematics class. It involved implementing a gamified system with positive and negative points for various behaviours, and tracking changes in student behaviour and engagement. Data was collected through field notes, point tallies, and observations from other teachers.



**Three key concerns** the author has about technology in this context are:

- 1. Students easily getting distracted by their iPads and losing focus on lessons
- 2. The risk of digital addiction in students due to increased device use during the pandemic
- 3. Technology potentially hindering students' social-emotional development due to limited in-person interactions during lockdowns

# "Adapting Programming Project Content to Encourage Girls' Success and Engagement“

# Gender imbalance in computing

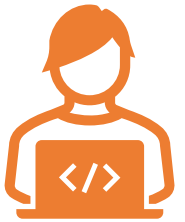
**The main problem addressed is the underrepresentation and lack of engagement of girls in computer science and programming. The trainee observed that girls in their secondary school computer science class showed less interest and involvement in programming assignments compared to boys.**

**Summary:** The trainee conducted action research over three cycles, implementing game-based and narrative-driven Python programming projects using the CodeCombat platform.

- They collected data through structured observations, student self-assessments, and a reflective journal. The research aimed to examine how integrating game-based elements into programming projects affected the achievement and engagement of 14-15 year old female students.
- They tried implementing narrative-focused programming activities, competitive and collaborative elements and expanding opportunities for open-ended, creative coding

**Three key concerns** the author had about technology in this context:

- The traditional approach to teaching programming may not align with the interests of girls.
- Cultural stereotypes and masculinized images of computing fields deter girls from pursuing computer science.
- The lack of visible role models and gender-inclusive curriculum design in computer science education.



# "How does the integration of video technology in badminton instruction impact teaching effectiveness and student learning outcomes?”

# Technology integration: video

**The main problem explored was low motivation and difficulties in improving badminton skills among students in the PE class. The researcher aimed to address this by integrating video technology into badminton instruction to enhance student engagement, skill development, and learning outcomes.**

**Summary**: The trainee conducted an action research study over three cycles with a class of Grade 11 students, incorporating video analysis. Data was collected through questionnaires, video recordings of student performances, self-evaluations, peer feedback, and teacher observations. The research explored how video technology could be used for skill analysis, self-assessment, and peer feedback in badminton instruction.

**Three key concerns** about technology in this context:

1. Time consuming: Students found the process of recording, uploading, and analysing video footage to be time-consuming.
2. Technical challenges: Some students struggled with using the software effectively, finding it initially overwhelming.
3. Video angle issues: Capturing the correct angle for effective analysis was challenging for some students, potentially limiting the usefulness of the video feedback.

# Facing the future: Are we ready for change?

- We are training the teachers of **tomorrow** right now…
- What **concerns** them?
- How does that **relate** to some of our wider concerns?
- What needs to **change**?
- We currently have no national **framework** for digital competence in England
- The teachers' standards (2011) and ITTECF framework (2024) **lack direction**

https://www.youtube.com/watch?v=cIDOrZuJzVU


# And yet...

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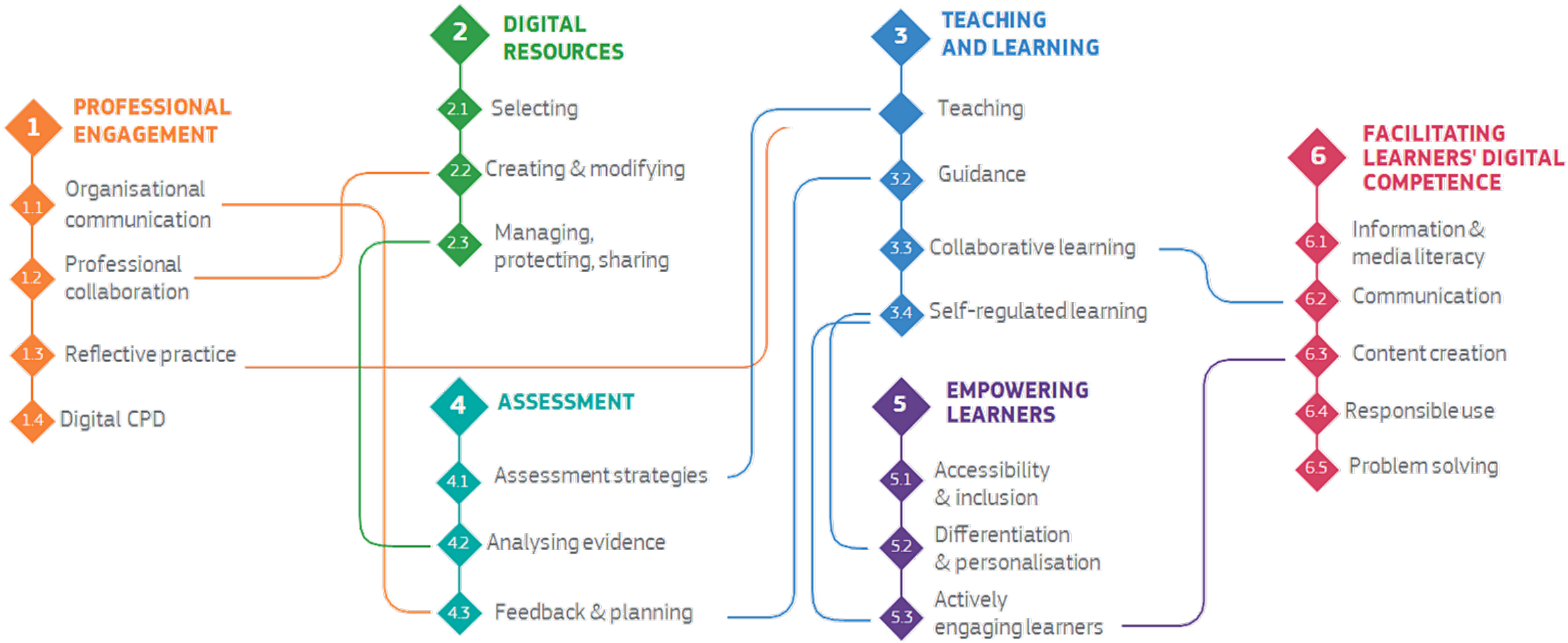
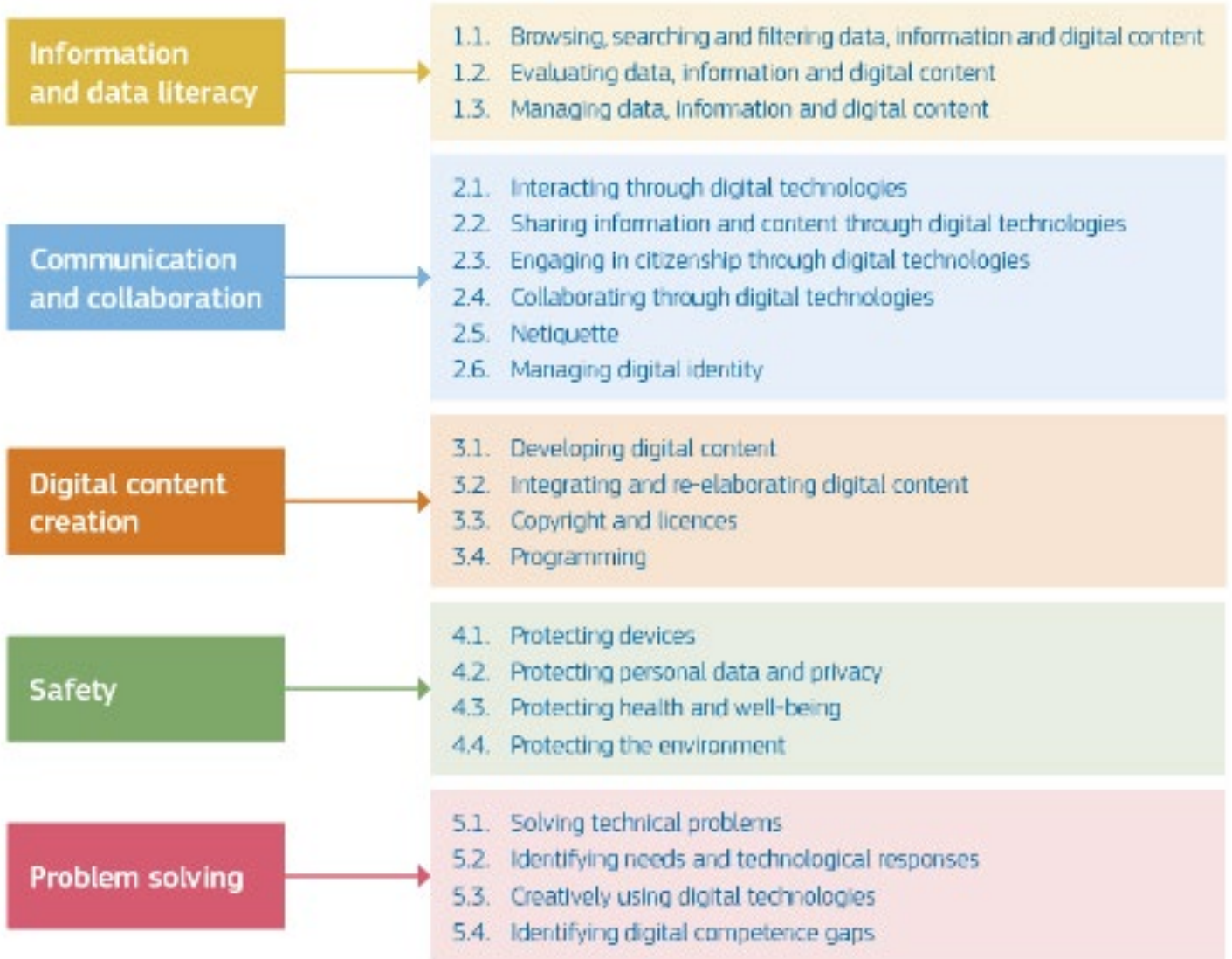
**Educators'** professional competences

**Educators'** pedagogic competences

**Learners'** competences



# The Digital Competence Framework for Citizens



# Call to action

- Make use of **expertise** to inform the digital agenda
- Provide clear **guidance** around digital skills and qualifications
- Review the place of digital skills in the **programmes of study**
- Clarify the place of digital technologies in **teacher competencies**
- Embed **professional development** for teachers right from ITT onwards

# Questions, comments, insights, suggestions ?

# References and further information


- The Digital Competence Framework for Citizens https://joint-research-centre.ec.europa.eu/digcomp/digcomp-framework_en
- Digital Competence Framework for Educators (DigCompEdu) https://joint-research-centre.ec.europa.eu/digcompedu_en
- Scutt C (2018) Is engaging with and in research a worthwhile investment for teachers? In: Carden C (ed) *Primary Teaching: Learning and Teaching in Primary Schools Today*. London: SAGE, pp. 595–610.
- Sharples J, Albers B and Fraser F (2019) Putting evidence to work: A school's guide to implementation. Guidance report. Available at: https://educationendowmentfoundation.org.uk/education-evidence/guidance-reports/implementation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