

Ofsted's Research Review – Computing

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Ofsted's research review for computing is part of a series looking at what some of academic research into teaching and learning has to say about the subjects on the school's curriculum. The reviews are presented in an accessible way, with teachers and school leaders in mind as their audience. Ofsted are upfront about the principles they use when selecting the research that's considered in each review, including alignment with cognitive science, the current inspection framework, and a subject-based curriculum, and so it should be unsurprising that the reviews support rather than contradict the criteria used by Ofsted in school inspections, including subject 'deep dives'.

Provision

Moving away from the research-led brief for the review, Ofsted take the opportunity to clarify curriculum expectations. They emphasise that computing at Key Stage 4 is part of the national curriculum entitlement for all pupils in local authority schools, and explain that academies should offer a curriculum of at least equivalent breadth and depth. I hear that a number of schools have subsequently revised their Key Stage 4 curriculum to include at least some computing (typically IT and digital literacy) for all. On the other hand, Ofsted interpret the EYFS framework rather narrowly, missing the references to technology that are present, and thus offer scope for early computing, and the crucial connection between the characteristics of effective learning as outlined in Development Matters and the subsequent development of computational thinking.

Ofsted cite our own research at Roehampton into curriculum time, supporting a view that an hour a week is insufficient to cover the computing curriculum at Key Stage 3 - in some secondary schools, it's even less than this. I'd say that heads of department might use this to argue for at least as much time as history or geography are allocated in lower secondary.

Ofsted also use Roehampton's research to observe that whilst access to computer science at GCSE has improved, there remain inequities. These are most obvious in the case of girls choosing to study computer science beyond Key Stage 3, by which point many girls no longer find the subject interesting. I think there's much that could be done to reinvigorate the content and teaching of the subject: an emphasis on creativity and problem solving could do much to make it more appealing for all pupils: both girls and boys.

Taking seriously the entitlement of all to learn some computing at Key Stage 4, increasing curriculum time for younger year groups and potentially increasing GCSE class sizes are all well and good, but Ofsted themselves acknowledge the challenge in recruiting and retaining computing teachers.

Curriculum

Ofsted seem keen to move away from the notion of IT (or even computing) skills, instead seeing the curriculum as developing both declarative and procedural knowledge, with the skilful use of technology being underpinned by both. Whilst the need for a 'knowledge rich' curriculum in computing is clear, I'm not sure there's enough regard here for the intrinsically practical nature of computing.

The report acknowledges the centrality of programming to computing, whilst recognising that this is, for many pupils, particularly difficult. Ofsted advise helping pupils to develop their mental models of computation ('notional machines'), as well as scaffolding the mental schema needed to organise this knowledge.

Rather surprisingly, to me at least, Ofsted express a degree of scepticism about block-based programming, such as in Scratch, which does not seem supported by much of the academic research. They seem to take a view that the choice of language should be determined by the aims of the curriculum, which gets interpreted rather narrowly as GCSE specifications. A more learner-centric position would be to continue with more accessible, and perhaps more engaging, block-based programming until the foundational constructs of programming are so well understood that the additional working memory demands of Python, or other text-based, syntax is unproblematic.

The review's section on computational thinking is rather underdeveloped, which is a shame as I think many teachers would benefit from clearer advice here. A clear framing of computational thinking as the search for automatable solutions to problems would certainly help, and rightly move computational thinking away from vague, generic skills.

Pupils' engagement in computing is likely to follow its application to contexts which they find meaningful. These could be linked to other subjects pupils study, or could be taken from interesting, real-world problems, or could be open-ended projects, perhaps with a creative focus or linked to making others' lives better. The review acknowledges the role of contexts in teaching computing, but their examples (code breaking in the second world war, the internet and digital mapping), whilst important, might be rather less engaging than, for example, gaming, 3D animation and digital photography.

On the other hand, I think Ofsted are right to introduce a note of scepticism around the idea of the 'digital native', urging teachers not to make assumptions about the technology skills (or indeed, procedural knowledge) of children and young people. Whilst the breadth of computing at GCSE is ill-served by current qualifications, Ofsted rightly affirm a need for a broad curriculum covering digital literacy and IT alongside computer science.

Pedagogy and assessment

Ofsted's review gives good, if rather unsurprising advice on the teaching of computing. It advocates explicit instruction, at least for novices, emphasising the need for new ideas to be taught clearly, rather than expecting pupils to discover these for themselves. It also emphasises the power of worked examples in teaching computing, including the use of 'sub-goal labelling', where the teacher explicitly identifies the stages in problem solving or the particular parts of an algorithm. I was surprised that the popular PRIMM (predict, run, investigate, modify, make) approach to programming did not receive a mention here. Pupils' activities should be aligned with the objectives of the lesson, and indeed curriculum - any planning should begin with what pupils should learn, rather than what they should do. Interestingly, Ofsted acknowledge the power of storytelling, and how this can link abstract ideas to concrete examples in computing.

Ofsted also advocate the use of textbooks, although I think many teachers remain unimpressed by the quality of many current offerings here. They also suggest a degree of caution in the use of unplugged activities, i.e. those which teach computing concepts away from actual computation, as these appear rather less motivating for pupils than those of a more practical nature, and can even introduce misconceptions.

Ofsted offer rather limited advice on assessment of computing - they mention the use of multiple choice questions, such as Project Quantum (bit.ly/quantumquestions; free registration required), and Parsons's

Problems (coding jigsaw puzzles), but those looking for advice on how to assess programming and other practical aspects of computing would need to look elsewhere.

Systems

Ofsted rightly identify the challenge of teachers’ subject knowledge in computing, and the need for senior leaders to provide computing teachers with sufficient subject-specific professional development.

They also recognise the challenge posed by school infrastructure to high quality computing teaching, urging that “perceived risks are weighed up and not used to limit the computing curriculum, unnecessarily denying pupils access to important knowledge and opportunities”.

Conclusion

I think there’s much to be welcomed here: there’s a clear view that computing should be an entitlement for all, up to the end of Key Stage 4; that computing deserves the curriculum time needed to do it justice; that computing teachers should be entitled to subject specific professional development; and that technology and policies should not get in the way of effective teaching.

I’d have liked to see more emphasis on the practical, creative nature of the subject, some advice on how to assess practical computing most effectively, and a recognition that lessons and resources should serve the learner, not just curriculum aims.

Partnership and Placement Annual Review

Following each placement, the Head of Partnerships produces an overview of the quality assurance data gathered, including the findings from Internal Moderation visits, External Examiner visits, placement evaluations and outcomes data. This scrutiny of our QA findings informs our improvement planning, including changes to placement requirements, structure and documentation; these priorities and actions are detailed in our Placement and Partnership Annual Review. A summary of the priorities for this academic year, and the actions we are taking to address these, is in the table below:

Priorities 2022-23	Actions
Further strengthen mentor understanding of the taught course	<ul style="list-style-type: none"> Redesigned Subject Specific Guidance, to indicate when topics are covered on the taught course. Students now upload highlighted Subject Specific Guidance page to Abyasa to support consistency of completion. Students now indicate (tick) each week to confirm they have made links to the taught course in their Abyasa reflections. Mentors confirm on Weekly Review form they have made links to the taught course in the Weekly Review meeting. Mentor pre-meeting agenda provides an opportunity for mentors to discuss links that will be made to the taught course in the reflective conversation, and for CTMs/SBMs/RMs to share best practice.
Further links to CCF in mentoring conversations	<ul style="list-style-type: none"> Reflective Questions replace the Exemplification Resource, demonstrating what reflection looks like across the Foundation, Developmental and Consolidation phases of a student’s programme. Students now indicate (tick) each week to confirm they have used the Reflective Questions to inform their Abyasa reflections. Mentors confirm on