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Symposium

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Using research to enhance CPD: teacher professional learning and school improvement through research and evaluation.

Title

Teacher Assessment in Primary Science (TAPS): use of a self-evaluation tool for school development

Key aims and outcomes

The Teacher Assessment in Primary Science (TAPS) project is funded by the Primary Science Teaching Trust (PSTT) and based at Bath Spa University's Institute for Education. It aims to develop support for valid, reliable and manageable teacher assessment, which can have a positive impact on children's learning. The TAPS team developed a pyramid-shaped school self-evaluation tool (final version March 2015). An online interactive pdf version was released in August 2015 which included examples of practice from a range of schools (Earle et al 2015); this is now available at the new PSTT website: https://pstt.org.uk/resources/curriculum-materials/assessment.

This paper discusses preliminary findings relating to use of the TAPS pyramid by examining feedback forms from TAPS presentation events. The symposium will explore use of the self-evaluation tool in more depth through case study presentations by two teachers.

Review of the relevant research

Gardner et al (2010) argue that teacher assessment has greater validity than testing because it can be based on a wider range of evidence. This is particularly relevant for practical and collaborative inquiry-based science education (Harlen and Qualter 2014). However, the reliability of teacher assessment is often questioned, since summative judgements are complex and there may be limited opportunities for moderation (Black et al 2011). Wiliam (2003) argues that, whilst teacher assessment can become more reliable, there is inevitably a 'trade off' between reliability, validity and manageability. If teachers do not have an explicit view of what constitutes effective assessment in science, then it becomes difficult to decide how to make improvements in practice (Gardner et al. 2010), thus a focus on developing assessment literacy could be key (Johnson 2012).

The Nuffield Foundation (2012) recommended that the rich formative assessment data collected by teachers in the course of ongoing classroom work in science should also be made to serve summative reporting purposes. They developed a pyramid model whereby assessment information flowed from classroom practice to whole school reporting. The TAPS team employed a Design-Based Research methodology to operationalise this model into a school self-evaluation framework. Research collaborations with local project schools, the Primary Science Quality Mark (PSQM) and

PSTT College Fellows allowed the team to consider and exemplify elements of teacher assessment at pupil, teacher and whole school levels (Earle et al 2015).

Initial TAPS findings included case studies which demonstrated a wide range of practice (Davies et al 2014), and analysis of the PSQM database which suggested that schools often had separate processes for formative and summative assessment (Earle 2014).

How the research was carried out

The symposium will focus on two elements of the TAPS project: early findings from an analysis of TAPS event feedback forms (discussed in this paper) and case study presentations from two teachers involved in the project (presented during the session).

Feedback forms were collected from 13 TAPS presentation events from June 2015 to March 2016. These included keynote presentations at cluster meetings, networks and conferences across the south of England with an audience of largely primary school science subject leaders. 267 feedback forms were collected from the 13 events. Whilst delegates had the option to not include their name, it is recognised that those who had negative views may not have completed a form and thus the data could be skewed to a positive response. Nevertheless, the wide range of events and large number of forms provides a basis for discussion regarding early feedback for the TAPS pyramid. A more extensive study into the impact of TAPS is currently underway.

The feedback forms included the following questions:

1. Have you seen the TAPS pyramid before? Yes/No
2. If yes: Have you used it to support science assessment in your school? How?

If no: What is your initial response? Do you think you would use it to support science assessment in your school? How?

3. How useful has it been/do you think it will be? Please rate the overall usefulness of the TAPS pyramid tool from 1 (not at all useful) to 5 (extremely useful).

For those teachers who had not seen the TAPS pyramid before, the responses contained ideas for ways that they *might* use the pyramid, however, those who had seen the pyramid before were able to describe if and how they had used it back in school. Since the focus of this paper is to consider actual use of the pyramid, then the analysis was carried out on the subset who had encountered the TAPS pyramid before. Of the 267 forms, 29% stated that they had seen the TAPS pyramid before, so the qualitative analysis focused on these 78 forms. Responses were coded to the question: 'Have you used it to support science assessment in your school? How?' A brief comparison was also made of the teachers' numerical rating of the TAPS pyramid tool where 1 represented 'not at all useful' and 5 represented 'extremely useful'.

Findings

Teachers new to the pyramid on average rated its usefulness as 4.2 and those who had seen the pyramid before averaged at 4.4 (Table 1). Both ratings are very positive but it is likely that this is inflated due to those with negative responses not completing forms, however, it is the slightly higher rating given by those who had seen the pyramid before which is most interesting. It could be argued

that this signifies the TAPS pyramid is more than just a 'nice idea'. When presented with a new framework, the teachers generally rated it as useful, but having had time back in school, the ratings are still high, suggesting that the TAPS pyramid is a tool which could support the science subject leaders in their role.

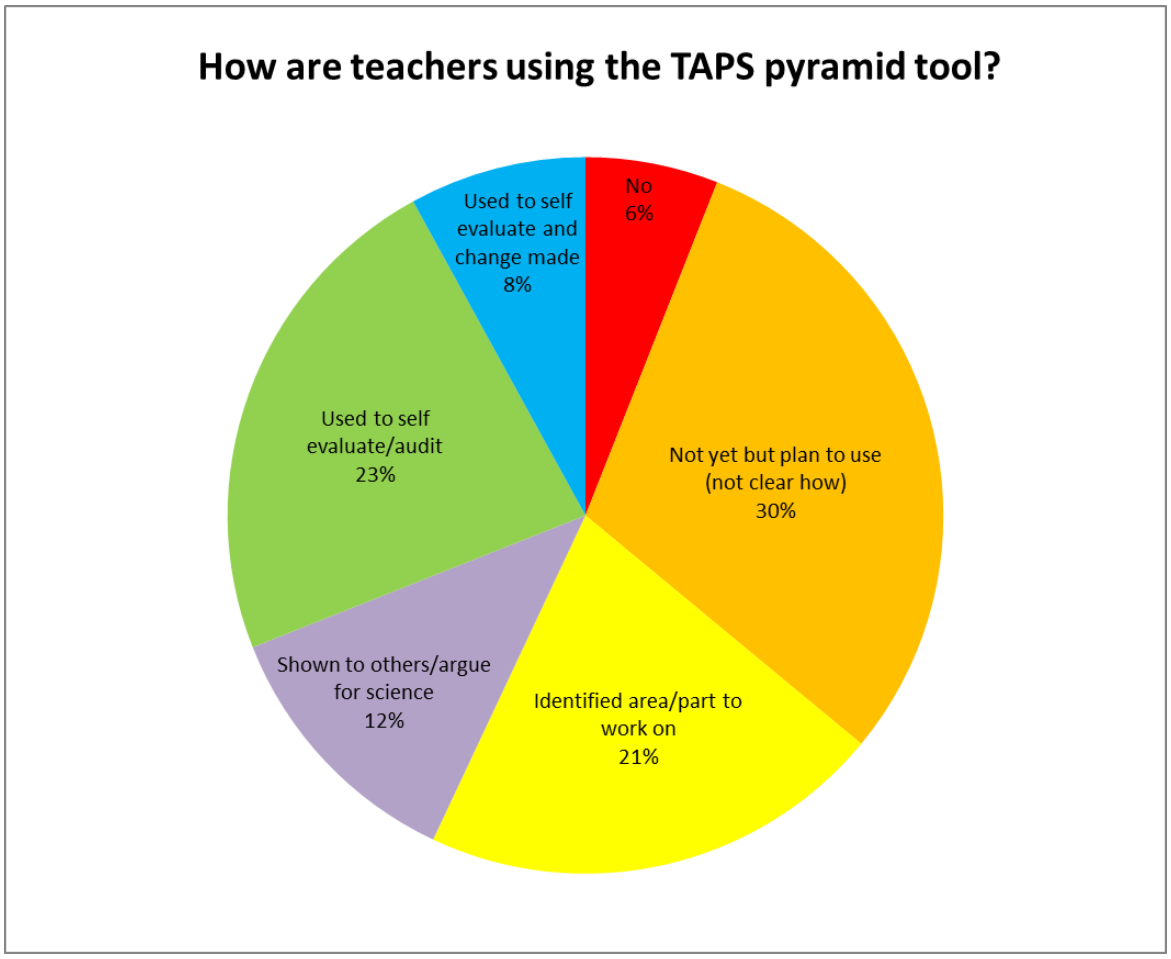
Table 1: Comparison of usefulness rating

	New to TAPS pyramid	Had seen TAPS pyramid before
Number of forms (N=267)	189	78
% of total number of forms	71%	29%
Average rating of usefulness of TAPS pyramid tool (from 1'not at all useful' to 5 'extremely useful')	4.2	4.4

Nevertheless, a positive rating of 'usefulness' tells us little about whether the TAPS pyramid tool has been used to support developments, or how it is being used. For this we turn to a more detailed analysis of the written answers (and the case studies within the symposium presentation).

For those who had seen the TAPS pyramid before, the 78 responses to: 'Have you used it to support science assessment in your school? How?' were coded into 6 categories (Chart 1).

Chart 1: How teachers who had seen the TAPS pyramid tool before reported using it (N=78)



The 6% who said they had not used the TAPS pyramid included: *"I wasn't sure where to begin, what to tackle first"*. This kind of uncertain response also appears in the 'not yet but plan to' category, for example, *"I'd like to use it now and feel that I understand it more this time around"*. It appears that the TAPS pyramid tool is complex when first encountered and that time is needed to explore it fully: *"not used yet- like it a lot but haven't had the time to fully explore or share it with colleagues"*. The stage of development of the pyramid may have had an impact on whether it was used, for example, the interactive pdf with examples did not go online until August 2015: *"I have seen it before but not used it but now it is interactive I fully intend to use it and pass on the website to colleagues and encourage them to use it"*.

A fifth of responses had identified a specific area to work on, for example: *"give the children more responsibility for their assessment", "identify progression across the school", "help me plan an inset".* 12% had shared it with their headteacher or other staff, with some using it to support an argument for science to have more of a focus or: *"have used it to suggest to staff that lots of different ways of recording and assessing science is okay".*

A quarter of responses discussed how they had used the TAPS pyramid tool to complete an audit or school self-evaluation. One respondent explained that they were: *"Identifying things we do well vs those we need to do more of/some of (!) eg we don't do much peer and self assessment compared with teacher feedback".*

The real test of the tool is to ask whether the self-evaluation had led to any change in the school assessment processes; 8% of responses were placed in this category because they described something which had changed:
"we discussed the pyramid during a science staff meeting following up the previous best practice meeting. It helped us to identify major gaps in our approach to science. We've since started Science Before and After entry/exit cards across the whole school which will provide great evidence for future moderations"
"I used it during the summer term to identify areas for development. I identified the need to report to parents and to continue to look at progression - we will report differently this year."

Further research will need to examine whether these changes are sustainable and whether the majority of respondents who had planned to use the TAPS pyramid to develop school assessment processes, did then go on to change school practice.

Implications for the teaching of STEM subjects

The science subject leaders who have provided feedback in this study appear to find the TAPS pyramid self-evaluation tool useful. Some have shared it with other members of staff or senior leaders, most have or plan to use it to complete a school self-evaluation and a small number have made changes to assessment practices. This early study points to the need to provide more time and further training for science subject leaders to be able to plan and implement changes to develop teacher assessment in primary science.

References

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