

**Constructing challenge in the curriculum: teachers' views
of the difficulties and risks involved and ways of
overcoming them**



4 Copthall House,
Station Square
Coventry CV1 2FL

☎ +44 (024) 7652 4036

☎ +44 (024) 7663 1646

✉ info@curee.co.uk

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Introduction

CUREE was commissioned by QCDA to explore some of the emerging findings from the Challenge Research Review (2009) and from the annual survey on constructing challenge in the curriculum. For this study challenge is defined as:

Irrespective of ability, challenging young people in curriculum terms means designing teaching and learning to elicit from learners their best efforts (i.e. challenge needs to be motivating) and to enable them to think and act in ways that are transferable and/or discipline-specific; and which are progressively more complex, critical, creative and independent.

Focus groups were used to investigate three key issues:

1. An important component in the construction of challenge in the curriculum relates to diagnosing individual learner's starting points in order to pitch the level of challenge appropriately: what do they know and what can they do already? There is evidence that teachers find this difficult. What are the difficulties teachers experience in doing this and how can they be overcome?
2. Under challenge and over challenge: there is some evidence that teachers choose to avoid the risk of 'over-challenging' learners. What can we learn about the risk assessments that teachers make and how teachers are setting about managing these risks?
3. Knowing when to 'step back' and assume a more facilitative role: there is evidence that this is a difficult judgement for teachers. What do teachers see as the main problems and how can they be overcome?

Methodology

Because most of the studies in the curriculum challenge review were focused on mathematics, science or English (or a combination) and because we wanted to secure a consistent sample that would enable meaningful comparisons (e.g. between primary and secondary and between different subjects) we ran two focus groups in each of the core subjects; one for primary and one for secondary (a total of six focus groups).

We intended that each focus group would comprise eight experienced teachers with curriculum associated responsibilities (subject leaders, subject specialists etc.) from different schools within a particular geographical location. We also aimed to achieve a good geographical spread across the focus groups. As the table below shows, we succeeded in recruiting a total of 52 teachers from Southampton, Winchester, Dorset, London, Leicestershire, and Cumbria.

Subject and phase	No. of participants	Geographical location
Primary mathematics	6	Southampton
Secondary mathematics	6	Dorset
Primary science	9	Winchester
Secondary science	9	London
Primary English	10	Leicestershire
Secondary English	12	Cumbria

We aimed to achieve representative samples for all focus groups by bringing together teachers from a variety of schools. However, it should be noted that by chance many of the secondary science teachers taught in areas of deprivation and some came from schools in Special Measures where morale was low. A strong characteristic of the primary English specialists was that they saw themselves as leaders in terms of constructing challenge in the curriculum. The secondary English focus group included a teacher from a special school for learners with moderate learning difficulties and a teacher from a pupil referral unit.

Drawing on extensive experience of focus group research, we developed activities and resources for each of the research questions in order to engage and structure the focus group discussions. These activities are detailed in the Appendix. Our aim always when engaging practitioners in research projects is to make the data collection process useful for the practitioners as well as for the project.

In this report we synthesise across the data for each research question in turn, identifying patterns and trends in the process. We start with a summary of the main findings followed by a more detailed treatment of the three issues. At the end of the report we draw out the implications.

Summary of key findings

What makes diagnosing what students know and can do already difficult and how can teachers overcome the problems?

The challenges

Overall, our focus group participants considered that two of the biggest challenges to diagnosing what learners know and can do already were lack of time to:

- listen to learners' explanations in depth, and
- observe learners carrying out activities.

They lacked time mostly because they felt that they had too many learners in their classes. Other reasons given for not being able to listen to learners' explanations in depth included:

- a concern to be seen to be 'teaching' (i.e. imparting information, which resulted in them doing much of the talking)
- having to prepare learners frequently for exams, and
- forgetting to ask open or probing questions or not having a ready repertoire of such questions to ask.

When it came to observing learners carrying out activities, participants again felt the main problem was too many learners to observe. They also commented on how problems were caused by learners' lack of independent working skills.

A key challenge reported by the English and science teachers (both primary and secondary) in particular was learners' limited ability to communicate their thinking fully. This was particularly pertinent for those working in special schools and with children for whom English is an Additional Language. The challenge of structuring tasks in ways that reveal learners' prior knowledge was highlighted as a problem area by the secondary mathematics teachers.

Overcoming the challenges

The participants identified a range of ways of overcoming the challenge of finding time to listen to their learners' explanations in order to diagnose their starting points. These included resource based solutions such as smaller classes and more teaching assistants. They also included remembering to refrain from doing most of the talking and asking probing questions. Some (the primary English specialists) believed that teachers could be supported in developing a repertoire of such probing questions which they could use when planning for the enactment of the curriculum in the classroom. The teachers also suggested using written approaches for diagnosing what learners know and can do already and structuring their learners' thinking by requiring them to record, for example, 'What I already know'.

The secondary mathematics teachers approached the challenge of diagnosing individual learners' starting points within large classes by gathering monitoring data (e.g. simply asking learners 'Can you do this?') and gauging where the whole class was by assessing a few key learners (their 'barometers') through deep and extended questioning.

When it came to time to observe their learners carrying out activities to diagnose their starting points, the participants again felt that smaller classes and more teaching assistants would help. But some (the primary English specialists in particular) suggested developing learners' independence as EYFS staff do. They found it 'odd' that 'we have a tendency of taking more control as the children get older rather than less'.

In terms of overcoming learners' poor communication skills, the teachers felt the way forward involved teaching learners to think about their learning and articulate their thoughts from the very start of school. They thought that staff could be trained to expect extended explanations, to challenge monosyllabic answers and not to fill the silence but wait for a more extended explanation. Several teachers mentioned the value of using a 'think-pair-share' approach whereby learners are given 30 seconds to think independently, then time to discuss with a partner. One of the pair then verbalises their joint response, but can fall back on the partner for help.

Ways of overcoming the challenge of structuring tasks in ways that reveal learners' prior knowledge included identifying the prior knowledge learners might need for a particular task and identifying key questions designed to reveal prior learning whilst planning.

There is some evidence that teachers choose to avoid the risk of over-challenging learners. What are the risk assessments that teachers make and how do teachers set about managing the risks?

Each group of teachers reacted strongly to the evidence that teachers choose to avoid the risk of over-challenging learners. They put forward a wide range of views. The science teachers expressed concern about over-challenging because they were worried about the risk of misconceptions arising. The mathematics teachers 'were not afraid to challenge' whilst the primary English specialists felt that there was 'no such thing as over-challenge'. Thus there appeared to be some differences between the different subject specialists with teachers seemingly more confident about challenging learners in English and mathematics than in science. But it may be the case that working in areas of deprivation (as was the case for many of the secondary science teachers we spoke to) and being 'leaders in the field of challenge' (as was the case for our primary English specialists) also had a bearing on their view.

All of the participants considered that the risks associated with over-challenge included learners losing confidence, self-esteem, interest and enjoyment in the subject and becoming demoralised, disengaged and disaffected. The clearest risk was generally felt to be disruptive behaviour, occurring when learners could not do a particular task. But the science teachers felt there was also the risk of misconceptions arising.

As a means of guarding against the risks of over challenge, the key strategy the teachers seemed to be establishing was an ethos where being 'stuck' or initially failing at a task was 'Okay' (suggested by the primary English specialists). This was regarded as an important part of the learning process. The strategies suggested by the other focus group participants consisted of building up faith and trust in the teacher (by, for example, being upfront about the challenge) and stepping the challenge (by, for example, starting learners off on an easier task that they can succeed at before offering a higher challenge). Often, these teachers seemed to use a combination of the two.

Knowing when to step back and let learners work things out for themselves. What are the main problems and how can they be overcome?

Most of our focus group participants (but particularly the mathematics specialists and the secondary science teachers) felt that stepping back and letting learners work things out for themselves was problematic. The exceptions were some of the secondary English teachers who said it was easy and some of the primary English specialists who said it was both easy and problematic. These teachers said they knew when they should step back and adopt a more facilitative role, but they sometimes found stepping back hard to do in practice. Although most teachers found stepping back hard, they recognised that doing so was important because it enables learning.

The main problem the focus group practitioners had with stepping back was that they simply found it hard to let go – they couldn't resist directive support. A number also felt that time (by which they often meant curriculum constraints) was an issue – rather than taking time to develop independent learning they stepped in to try to help learners progress more quickly. Again, the science specialists seemed particularly concerned about misconceptions creeping in if they let learners try to work things out for themselves. Some of the teachers suggested that didactic teaching was easier than adopting a facilitative approach because they felt more in control. A few felt that their learners, particularly boys, were not able to work independently enough for them to let go.

For those teachers who did feel able to step back, the key seemed to lie in training the learners to become independent. They helped to make learners more independent by conveying expectations that learners would have time and space to figure things out for themselves. They made tasks 'safe enough to let go' by putting strategies in place to scaffold or structure the learning – in other words, they did not leave learners completely to their own devices.

Detailed findings

What makes diagnosing what students know and can do already difficult and how can teachers overcome the problems?

1.1 Overview of all the challenges

Overall, our focus group participants considered that two of the biggest challenges to diagnosing what students know and can do already were lack of time (largely because of large class sizes) to:

- listen to learners' explanations in depth, and
- observe learners carrying out activities.

However, the participants noted the importance of listening to learners' explanations and observing the learners carrying out activities, for example, 'It's not until you get onto practical investigations or start to probe them that you realise they may have the 'knowledge' but they don't really understand it.' (Primary science specialists).

A similar, related challenge, particularly for the mathematics specialists (both primary and secondary) was how large class sizes made it difficult for them to diagnose learners' individual starting points, making it possible for them to identify and build on only a few.

The English and science specialists (primary and secondary) identified a further key challenge in their subjects: learners' limited ability to communicate their thinking (particularly pertinent for those working in Special schools and with children for whom English is an Additional Language).

Other challenges the participants identified appeared to relate to specific phases and subjects:

- the secondary mathematics teachers felt that structuring tasks in ways that make learners' existing knowledge observable was difficult – they were uncertain about how to do this
- the primary English specialists noted that questioning skills were a problem area in their schools. They commented that less experienced teachers tended not to have a ready repertoire of more probing questions and some were working on this with their colleagues
- the secondary science teachers highlighted the pressure they felt under to get learners through the three GCSE modular examinations and coursework which they felt further limited the time they had available to listen to learners' explanations and observe learners carrying out activities, and
- some of the primary science specialists highlighted the difficulty they experienced when learners said something unpredictable that threw their thinking about what the learners knew or could do already.

1.2 Why the participants found listening to learners' explanations in depth a challenge

Between them, the participants identified three main causes of the problem:

- having too many learners to listen to in a short space of time
- curriculum constraints
- teachers being concerned about being seen to be 'teaching' (imparting information) which resulted in them doing most of the talking in lessons rather than the learners.

Having too many learners to listen to was seen as a problem by participants with large classes (30 plus). This applied to most of the participants working in mainstream schools. It was not perceived to be so great a problem by the participants from Special schools who had small classes. They felt having smaller classes helped them to get to know their learners well. The mainstream secondary English teachers for example commented that they felt under constant pressure to move quickly from group to group to assess them. The secondary science teachers commented that with large class sizes:

- 'There's no chance of in-depth conversations with any of them'.
- 'You tend to miss out talking to the well behaved learners'.
- 'We can't talk to them all individually – all we can do is get a rough idea of where the majority are at'.

All of the secondary science teachers felt that the time they had for listening to learners was particularly constrained at Key Stage 4 through having to “constantly” prepare the learners for each of the three modular exams for GCSE.

The teachers who commented on teachers' desire to be seen 'teaching' and therefore doing most of the talking in lessons explained that listening to learners can feel like 'wasted time'. Some were aware that asking open questions that required learners to 'explain how they know that (in mathematics)' for example was important, but said they did not always remember to ask such questions.

1.3. Ways of overcoming the challenge of finding time to listen to learners to find out their thinking

The participants made the following suggestions:

- smaller classes 'so you have time to prompt learners and allow them thinking time', 'other learners will have more patience in smaller classes because they will know that they will also get a turn'
- more team teaching
- more teaching assistants
- observing specific groups in rotation (asking, for example, 'what are you thinking now?' and making written observations to reflect on later)
- remembering/being reminded to refrain from doing most of the talking
- training teachers to ask probing questions designed to reveal the learners' thinking
- written approaches such as asking learners to produce e.g. a mind map at the end of the lesson (primary science) or 'writing down and showing your thinking and your working' (primary mathematics), and
- structuring the learners' thinking through using the Thinking Actively in a Social Context (TASC) wheel which requires learners to say 'What do I already know and what do I need to find out?'

1.4. Why the participants found observing learners carrying out activities a challenge

The participants identified two main problems:

- lack of time due to large class sizes which meant they moved quickly from group to group, and
- learners' lack of independent working skills.

1.5. Ways of overcoming the problems associated with observing learners carrying out activities

The participants made the following suggestions.

- 'Do less, but well' – for example, focusing on different groups of children in rotation and not necessarily aiming to observe all groups in one lesson.
- Deliberately setting up activities that would give them time to observe the learners and give the learners opportunities to show their skills to the teacher.
- Develop learners' independence as EYFS staff do – "this would provide teachers with more time for observation (and listening)". The primary English specialists commented that it was "odd that these [EYFS] practices [child initiated and independent learning] petered out as the children progress through primary school ... we have a tendency of taking more control as the children get older rather than less".

The participants also felt the following would help:

- smaller classes
- more team teaching, and
- more teaching assistants.

1.6. The challenge of diagnosing learners' individual starting points in large classes

The primary mathematics specialists said they felt guilty about not having the time to do more one-on-one work to assess their learners' prior learning. They listed a number of alternative strategies that they used including:

- arranging for the children to work in groups and pairs and then requiring them to feed back where they are at
- whole class response systems such as thumbs up/down and traffic lights to show levels of understanding
- teaching assistants feeding back what they have observed and heard to the teacher, and
- flexible grouping – involving children in deciding for themselves their own starting point and which group they should be in.

The secondary mathematics teachers felt that overcoming the challenge of large class sizes in relation to diagnosing individual learners' starting points involved compromise. One such compromise was making judgements about what learners knew and could do already based on superficial data that was easy and quick to gather:

"Sometimes you just have to go with simply asking them 'can you do this?' Although what you would really like to do is test understanding in more depth".

"Sometimes you just have to go with your impression of the understanding you think particular learners have and not feel the need to be necessarily forensic about it – you don't always have to use a test".

Another compromise was to "gauge where the whole class was by assessing a few key learners" through deep and extended questioning. One teacher referred to these key learners as her "barometers". The teachers agreed that "usually there are many learners at the same point" in any one class. The key students (the barometers) represented groups of learners within the class which they felt showed similar levels of understanding. So rather than finding out the extent of every learner's level of prior learning, the teachers would aim

to find out the extent of the prior learning shown by key learners as an indication of the level of others in the same 'group'.

1.7. The challenge of learners' limited ability or inclination to communicate

The participants identified a number of problems associated with communication skills:

- learners giving monosyllabic answers
- learners lacking the necessary vocabulary
- adolescent learners in particular being "very good at hiding what they know because they don't want to look a fool or too bright – they want to look average and blend in"
- lack of confidence – for example, "they know you will want to push them on, but if they are not very confident they would rather stay in their comfort zone", and
- learners not being interested in giving answers because they "just want to be told what the answer is and not have to work it out for themselves" (indicating learners' lack of independent learning skills).

1.8. Ways of overcoming learners' poor communication skills

Between them, the participants suggested the following strategies:

- teaching learners to think and articulate their thoughts from the very start of school
- training staff to expect extended explanations and to challenge monosyllabic answers – also training teachers not to fill the silence, but wait for a more extended explanation
- using a 'think-pair-share' approach to build learners' confidence whereby learners are given 30 seconds to think independently, then with a partner. One pair then verbalises their joint response, but can fall back on the partner for help
- giving learners keywords to use and asking them to say what they already know about the keyword
- sometimes requiring written rather than verbal explanations, such as using a picture as a stimulus and asking learners to write on post it notes what they already know, or producing a mind map at the end of a lesson, and
- asking learners to say what they would tell younger learners about the topic so that they would understand it.

1.9. Overcoming the challenge of structuring tasks/tests in ways that reveal learners' prior knowledge

This was highlighted as a problem area by the secondary mathematics teachers. One teacher commented on a published scheme of mathematics text books which she had particularly liked using because the books clearly explained the prior knowledge learners needed for each topic. This took the form of 'to do this you need to be able to do this and this ...' and gave examples for the learners to work through that helped her to identify where they were at. She felt having the necessary prior knowledge and tasks designed to reveal prior knowledge already worked out was very helpful to her because she felt there really wasn't time for teachers to work it all out for themselves. What she did do however was identify some key questions in advance designed to reveal prior learning as part of her planning, which she felt "was time well spent".

1.10. Overcoming the challenge of teachers asking the kind of questions that will reveal what learners know and can do already

This challenge was identified by the primary English teachers. They saw that the way forwards lay in teachers working together to develop a repertoire of challenging questions, planned out in advance that would help the more able children to develop their thinking and involve the quieter children. One teacher explained his experience:

“We have worked in our school on asking probing questions and not simply accepting a child’s first response. We have a lot of early career teachers who we have trained in open questioning, but when we observe their lessons, questioning is still an issue. Inexperienced teachers find it hard to think on their feet, which is why it would be helpful to have a repertoire of questions planned out in advance”.

As experienced teachers themselves, they felt they already had that repertoire of probing questions and also the confidence to handle an unpredictable answer but that they needed to build these skills in their colleagues.

There is some evidence that teachers choose to avoid the risk of over-challenging learners. What are the risk assessments that teachers make and how do teachers set about managing the risks?

2.1. Did the focus group participants choose to avoid the risk of over-challenging learners?

Each group of teachers reacted in a different way to the evidence that teachers choose to avoid the risk of over-challenging learners. They put forward a wide range of views:

- the secondary science teachers seemed concerned about over-challenging their students (partly because they were worried about over loading their learners and partly because they were worried about misconceptions creeping in – see 2.2) At the same time, several of them felt they did not challenge students enough
- whilst the primary science specialists felt that it was important that learners were supported out of their comfort zone, some felt they under challenged at times and were concerned about this
- the primary mathematics teachers sometimes felt under external pressure to over challenge; they felt they needed to remember to exercise their own professional judgement about what individual learners need in terms of challenge
- the secondary English teachers felt they did their best to challenge learners and stretch them as much as possible
- the secondary mathematics teachers said they “were not afraid to challenge” and said they were more concerned about under challenging and that they constantly “raised the bar” even in low attaining groups
- the primary English teachers felt “there was no such thing as over challenge”.

Subject differences in these responses suggest that teachers may set out to challenge learners more in English and mathematics than in science perhaps because it is easier for teachers to offer more open-ended activities or gradually step the challenge in English and mathematics than in science. But it may be the case that working in areas of deprivation (as was the case for many of the secondary science teachers we spoke to) and being “leaders in the field of challenge” (as was the case for our primary English specialists) also had a bearing on their view.

2.2. The risks associated with over-challenge

The following risks were common to all the focus group participants. They all involved some form of reaction from the learners:

- loss of confidence (learners feel they aren't achieving/will never succeed) and lowered self-esteem, confirmation of self-doubt ("I can't do it", "I've never been any good at Shakespeare" etc)
- loss of interest and enjoyment in the subject, with learners developing a negative view of the subject
- learners becoming demoralised, feeling inadequate, defeated, upset or stressed (through finding the work too hard or not achieving a good mark)
- disengagement (learners 'switch off')
- breakdown of trust in the teacher (feeling "the teacher is not a good teacher" or that they are being "set up for failure") and damaged teacher-learner relationship, and
- disaffection, alienation and disruptive behaviour.

Some additional risks were specifically identified by the mathematics and science subject specialists:

- "misconceptions arise and learners become confused because the basics haven't been embedded" (primary and secondary science teachers)
- missing out important steps; learners not having time to consolidate and embed learning, then having to "fix what you have broken" (primary mathematics specialists), and
- "if challenge involves acceleration (moving onto work which is for other years) then there would be progression problems" (secondary mathematics teachers). These teachers said they were particularly careful not to equate challenge with acceleration because of the danger of missing out steps. They preferred to "dig deeper than climb higher" in order to ensure deep foundations of understanding were laid".

A few of the teachers also associated some teacher-related risks with over challenge. These included that teachers may:

- worry about their subject knowledge – "will the children meet the challenge and out run them?" (primary teachers)
- lose morale because the learners don't achieve so well (secondary teachers).

Although they identified a range of potential risks, the teachers generally felt that deterioration in behaviour was an especially big risk when challenging learners. The risk of disruptive behaviour was felt to be particularly high by the teacher who worked in a learner referral unit where "the vast majority of learners have difficulty in accessing the curriculum because they feel 'thick' – they find it easier to 'kick off' than engage with the task". The participants suggested that bad behaviour among more able students was not so hard to manage.

Some pointed out how poor behaviour is just an indication that the learners cannot do a particular activity. They felt it important that teachers recognized in these situations that it is the curriculum task that is the problem rather than the behaviour. One teacher summed this point up in these words:

"Many teachers (particularly inexperienced ones) tend to see the problem as behaviour rather than the cry for help that it really is. They see it as an excuse and

don't see that they may have to re-explain or change their approach. They may not be willing to change their teaching because they don't want to admit that they presented the task/activity in the wrong way".

2.3. Ways of guarding against the risks associated with over-challenge suggested by the participants

Creating an ethos of "it's okay to be stuck"

The key appeared to be the teacher establishing an ethos which makes clear that:

"It's okay to be stuck... It's ok if I get something wrong... If I'm stuck I know where to get resources to help... If you haven't got stuck, then you're not learning" (primary English specialists).

The primary English specialists (who saw themselves as ambassadors of challenge) in particular strongly emphasised this point. They believed that "learning is about taking risks" and that "people (children and adults) who take risks and succeed feel much better for it". They felt it important to help learners see that there "is nothing wrong with failing sometimes". To do this, they sometimes "modelled failure". This sometimes took the form of working through problems with their learners to demonstrate that they did not always know the best or "right" way of doing something. At the same time, they promoted a positive mindset – that, "if something doesn't work, then find another way". They knew that they had successfully achieved such a classroom culture when they heard learners telling each other "going wrong is okay". They felt that "once they realise that [it's okay to fail], learners will easily get over any failure they experience and go on to succeed and achieve".

In a similar vein, the primary mathematics specialists pointed out that more able learners had the potential for damaged self-esteem and poor behaviour etc as much as less able learners if they felt over challenged because "they are used to getting it right". Although there was the potential for challenge to have a negative impact, the teachers felt it important that these learners also sometimes experienced getting things wrong (presumably within a supportive classroom climate similar to that created by the primary English specialists).

Other strategies

Between them, the participants also suggested a number of other strategies for guarding against the potential risks they identified. These broadly seemed to fall into two types: building up faith and trust in the teacher and stepping the challenge. The teachers appeared to use combinations of these strategies.

Building up faith and trust in the teacher

The kind of strategies the participants suggested included:

- being up front – teachers presenting tasks they know to be highly challenging in a positive way, by saying, for example, "This is way above what we'd normally do in Key Stage 3, but I thought you'd be up for it" is likely to get the students "excited about it"
- being honest – for example, after noticing that learners have found a task too challenging, explaining that "I thought you'd be able to do it, but I can see that you've found it really hard, so let's start again ... " and then breaking the task down into smaller chunks to show they can do it, and
- reminding learners of what they have done well at and enjoyed in the past, and positive reinforcement as they achieve different stages of tasks.

Stepping the challenge

The kind of strategies the participants suggested included:

- having a progression of skills/activities for all abilities planned out before the lesson, so that once learners have successfully completed a task, the teacher can offer higher challenge by asking learners to “have a go at this ...”
- allowing learners to choose between easier and harder activities and “over time they will start pushing themselves and choose to move to the more challenging tasks”
- starting learners off on a task that they will be successful at before moving onto higher challenges
- having a balance of activities over a week or unit; starting with the basics, then giving the learners lessons with more freedom and open challenges
- providing some scaffolding such as a diagram to stick into their books which they can label, or drawing the graph axes for them
- encouraging learners to work together and help each other, but also set challenges for each other, and
- judging when to step in and how to provide effective help. For example, one teacher said, “I’ll pause the class and say ‘Who’s got some ideas on how we could break this down?’”

Knowing when to step back and let learners work things out for themselves. What are the main problems and how can they be overcome?

Most of our focus group participants (particularly the mathematics specialists and the secondary science teachers) felt that stepping back and letting learners work things out for themselves was problematic. The exceptions were:

- half of the secondary English teachers who felt it was easy
- half of the primary English specialists who felt it was both easy and problematic (because they knew when they should step back, but they sometimes found actually stepping back hard to do in practice), and
- a minority (two) of the primary science specialists who felt it was easy; the rest felt it was both easy and problematic. (They felt much depended on the experience of the teacher, and how well the teacher knew the child and the child’s level of ability).

They recognised the importance of stepping back however:

“When you DO step back then you get the clearest understanding of where learners’ understanding is, but it is hard to do” (primary mathematics specialist).

“It is important to step back as much as possible because it helps learners learn and find some of the magic themselves” (secondary mathematics specialist).

3.1. The problems the focus group participants associated with stepping back and letting learners work things out for themselves

One of the main problems seemed to be that they simply found it hard to let go – they couldn’t resist helping:

“Teachers by their nature want to be helpful and ‘teach’” (secondary English teacher).

“I’d like to say it’s easy, but when you see children aren’t on task then you just can’t help yourself – you step in to move them on” (primary English specialist).

“You feel guilty ... As a teacher, you want to teach and not leave them to struggle. But you need to achieve the right balance between letting them get stuck and start to figure things out for themselves then step in at the right time” (primary science specialist).

“Because I love maths I really want them to understand and love it so I tend to get too involved – you feel like you are failing the learners for secondary school if they don’t get the basic understanding, but you can end up over doing your involvement” (primary mathematics specialist).

“It’s hard not giving them the answers or telling learners ‘yes that’s right’. We know it’s important to let children have that uncomfortable feeling of not knowing or getting it wrong, but it is hard to do. They need to learn not to need reinforcement and that getting it wrong sometimes is OK” (primary mathematics teacher).

A number also felt that time (by which they often meant curriculum constraints) was an issue:

“If we had unlimited time then we could say, ‘we’ll focus on this again tomorrow’ and catch up later, but in Year 6 there is no ‘we’ll catch up next year’ so the time pressure grows” (primary mathematics specialist).

“If I stood here for five more minutes they’d get there themselves, but I need to move on” (secondary mathematics teacher).

“We are so drilled into thinking all learners must make progress in every lesson” (secondary mathematics teacher).

“The pressure mounts as exams get close – you start teaching them what they need to do for the exam, especially the lower ability group” (secondary English teacher).

“The pressure of feeling the need to move on through the curriculum stops you from having too many open-ended problems which would enable you to step back more” (primary mathematics specialist).

The science specialists seemed particularly concerned about misconceptions creeping in:

“When learners think they have worked something out, we don’t want to have to correct them later” (secondary science teacher)

“Science is very abstract and factual ... we can’t let learners wander down an irrelevant path” (secondary science teacher).

“In science you need to step in quicker because of the mess they could make if you didn’t!” (Primary science specialist).

Some of the teachers suggested that didactic teaching was easier:

“It can be difficult for teachers to stop talking” (primary science specialist).

“Stepping back means setting yourself up to be responsive to where students get to ... you have to be alert and awake enough to respond to the learners in appropriate ways” (secondary mathematics teacher).

“You have to know your learners and their personalities very well before you can step back which is only possible in a small group” (secondary science teacher).

“You fear lessons going wrong and deteriorating behaviour if you let go” (secondary English teacher).

A few felt that their learners were not able to work independently enough for them to let go:

“The teacher needs to be on top of the class all the time, giving them set times to do a task etc to ensure they do the work. Boys are particularly difficult to let go of” (secondary English teacher).

“Their ability to read is limited – this is a barrier to them working on their own” (secondary science teacher).

3.2. What helped teachers to step back

For those teachers who did feel able to step back, the key seemed to lie in training the learners to become independent learners.

They helped to make learners more independent by creating expectations:

“I say ‘I’m going to let you get on with this, but I will be back in five minutes to see how you are getting on’ (primary science teacher).

“I do not accept ‘I can’t do it’ as an excuse... I ask them to explain what it is that they can’t do and this seems to help them figure things out for themselves” (secondary English teacher).

“If you say it once and then ask them to get on with it, they know they have to listen to be able to do the work. If learners know that you will go over it again and again, then they won’t bother listening” (secondary English teacher).

They made activities safe enough to let go:

“I provide groups with a handout that explains the task then let groups work out the task for themselves” (secondary English teacher).

“I get learners to explain the activity to each other then I stand back and let them get on with it” (primary science specialist).

They also put strategies in place to scaffold /structure the learners' learning:

"I put a list of key words on the board and ask learners to highlight the words in the text. I find it helps them gain a better understanding than just reading the text does" (secondary science teacher).

"I say that by the end of the lesson I want you to be able to tell me one thing you have learned ... or present your findings to the rest of the class" (primary science specialist).

Conclusion

We focused on the issues surrounding diagnosing learners' starting points, ensuring learners are challenged, and teachers stepping back and assuming a more facilitative role because the Challenge Literature Review (2009) had found that teachers:

- find diagnosing learners' starting points difficult
- may avoid over-challenging learners because of the risks involved, and
- experience difficulty with assuming a more facilitative role.

In addition, the survey evidence revealed that around 25% of learners felt that they were not being challenged by their school curricula.

How did teachers perceive these issues on the ground? How were they tackling these problems?

Diagnosing starting points

In many of the studies included in the literature review, teachers were clear about the need to design tasks and resources that were appropriate to learners' starting points. This meant teachers knowing what individual learners knew and could do already. Amongst other things, the review highlighted the importance of questioning as a key diagnostic tool.

Consistent with the review studies, focus group participants reported that large class sizes made it difficult for them to find time to listen to learners' explanations in depth to find out what they already knew. They also thought it important to observe learners carrying out activities so that they could see what they could do already, but commented that as well as large class sizes, learners' lack of independent working skills made it difficult for them to do this. Also consistent with the review, the secondary mathematics teachers in particular described how they approached the challenge of large class sizes by forming rough groups of learners in their mind. They said that they tended to assess a few key learners orally – one from each virtual group – who they referred to as their "barometers", through deep and extended questioning. They then extrapolated from this to the rest of the class.

Some of the focus group participants (the primary English specialists in particular) were actively supporting less experienced colleagues to develop a repertoire of probing questions designed to reveal prior learning. A few of the focus group participants also suggested written approaches for diagnosing what learners know and can do already. But it was not just a case of asking suitably probing questions. The English and science teachers specifically commented on learners' limited ability to respond effectively and communicate what they were thinking. Ways of overcoming learners' poor communication skills suggested by the participants included training teachers to expect extended explanations and not to fill the silence, and requiring learners to think and share their thoughts together in pairs before

verbalising their response. The primary English specialists suggested that the development of these skills – i.e. learners’ ability to reflect on their learning and to articulate such thoughts – should be encouraged from the Foundation Stage.

Challenging learners

There was some evidence in the review that teachers worried more about over-challenging their learners than under-challenging. Little is known about how pervasive this view is amongst teachers. Our focus groups revealed an apparent difference between subjects, with mathematics and English teachers seemingly more confident about offering learners ‘high challenge’ than the science teachers, who seemed to be concerned about “misconceptions” arising if they challenged learners too much.

The review found that when teachers challenged learners, they found that some learners were reluctant to do things they knew they couldn’t do or couldn’t do well. The review noted how gifted and talented learners in particular found it hard when they experienced failure at these times. But the review also highlighted how learners need to experience periodic challenge and even momentary failure in order to develop higher levels of self-efficacy (capacity to reach their goals) and task persistence.

The focus group participants were able to contextualise and illustrate the fears they had about the likely impact on learners of tasks they found too hard. These included loss of confidence, self-esteem, interest and enjoyment, breakdown of trust in the teacher and becoming demoralised, disengaged and disaffected. Disruptive behaviour was seen to be one of the clearest indicators of learners finding work too hard. The focus group teachers felt it important that teachers recognised when poor behaviour was actually a cry for help.

The review noted a number of ways of supporting learners to complete highly challenging tasks and activities. These included:

- mixing easy tasks with more challenging activities
- giving learners opportunities to select the tasks they tackled so that they varied the level of challenge themselves
- increasing scaffolding
- more feedback and praise, and
- peer support.

Among the strategies offered by the focus group participants, the most important appeared to be establishing a ‘safe to fail’ ethos where being stuck or initially failing at a task was recognised as an important part of the learning process. This was the approach used by the primary English specialists who viewed themselves as leaders in the field of challenge. The strategies offered by the other focus group participants were consistent with the review findings, and included ways of stepping the challenge (e.g. starting learners off on an easier task that they can succeed at before offering a higher challenge). The focus group participants also thought it important to build up faith and trust in their practice as teachers by being upfront about the challenge.

We noticed that none of the focus group participants appeared to use peer support for supporting learners in completing highly challenging tasks in their own classrooms. By contrast, our review of the literature highlighted the effectiveness for pupils of all abilities of:

- structuring group work so that pupils are interdependent and thus provide each other with both support and challenge

- structuring group work so that all participants have identified roles in fulfilling group tasks, and
- explicit teaching and modelling of group work skills.

Taking on a more facilitative role

The review noted that one of the key judgments teachers had to make related to the development of learners' independent inquiry and problem-solving skills. But, the review noted, teachers may be uncomfortable with this approach, especially when learners make mistakes during the process.

Although they recognised stepping back was important because it enabled learning, and they knew they should step back, most of the focus group participants said they found adopting a more facilitative role was hard to do in practice. Consistent with the review findings, their problem seemed to be they felt uncomfortable about letting go – they were concerned that their learners wouldn't progress quickly enough. They also felt that their learners were not able to work independently. In science the concerns went deeper: teachers feared that misconceptions would arise if they let learners try to work things out for themselves.

There was evidence in the review that teachers who adopted a more facilitative role had deliberately and gradually handed over ownership and responsibility to their learners. Similarly, the minority of teachers who said they did let go (mostly secondary English teachers), felt able to do this because they had put strategies in place to scaffold or structure the learning and their learners' independence.

Implications

The focus group evidence suggests that teachers with an interest in challenge are focusing their efforts towards a number of strategies where additional support and recognition could reinforce and/or enhance progress. These include supporting teachers in:

- both designing probing questions to draw on in lessons and strategies for deploying them
- structuring tasks and tests in mathematics in ways that make learners' existing knowledge observable and in identifying the mathematics skills needed in advance of tackling a topic
- training learners to be independent (which would help both with teachers' ability to let go and observe learners, and with exam preparation) and in structuring activities in ways that allowed for learning that is increasingly independent of the teacher
- developing learners' communication skills right through school – including training teachers to support learners in rehearsing and giving extended answers through open questioning, and strategies such as think-pair-share
- developing learner observation skills (building on EYFS practices)
- making use of written approaches for diagnosing learners' starting points (such as 'Thinking Activity in a Social Context' – TASC, or requiring learners to write a guide explaining a concept to younger learners)

- identifying whether poor behaviour is the result of learners feeling over-challenged and being prepared to re-explain or change the approach used
- establishing an ethos where it is safe to fail and the message that being stuck is an important part of the learning process, and
- ensuring curriculum materials in general are more specific about the prior knowledge and skills needed and common patterns in misconceptions.

It might also be helpful to encourage practitioners and curriculum planners to consider together common obstacles for setting an appropriate level of challenge and ways of overcoming these.

The practitioners who attended our focus groups found the process extremely helpful.

Recommendations

There are two areas where we think the focus group evidence taken together with the evidence from the literature review suggests additional development, so we offer the following more direct recommendations for practitioners.

We recommend that teachers concerned about over challenge or interested in offering greater challenge:

- explore tools and resources for designing curriculum experiences through structured group work as an explicit strategy for enhancing challenge. Examples of research based tools and resources based on the work of Rupert Wegerif and colleagues can be found on the GTC's Research for Teachers website (www.gtce.org.uk/teachers/rft/achieve1106/)
- consider, in the context of science in particular, the importance of asking learners to talk through their ideas about scientific concepts and make their potentially alternative thinking explicit. Ways of doing this are illustrated in the forthcoming GTC Research for Teachers summary 'Students ideas about science' based on Rosalind Driver's book, *The Pupil as Scientist?* (First published 1983, reprinted 2008). See: www.gtce.org.uk/teachers/rft/

Appendix –Tools used at the focus groups

Question 1

An important component in the construction of challenge in the curriculum relates to diagnosing individual learner's starting points in order to pitch the level of challenge appropriately: what do they know and what can they do already? **There is evidence that teachers find this difficult. What are the difficulties teachers experience in doing this and how can they be overcome?**

1. Participants (working in 2 groups of 4) to identify from the statements below (which are possible reasons for why they might find diagnosing learners' starting points difficult) their top 5 in order of difficulty and sticking the statements on the chart provided. (Participants can add/write in their own statement(s) if they wish).
2. Each group to explain the 'story' of their chart – give reasons/examples.
3. Facilitator to take the top 2 statements from each chart (i.e. the ones that caused the most difficulty) and ask the other group to think how they might be overcome.

Possible reasons for what might make finding out what students know and can do already difficult

- Lack of time to observe students carrying out activities
- It's difficult finding the time to listen to students' explanations in depth
- It's difficult structuring tasks in ways that will make students' existing knowledge observable
- It's difficult to know what questions to ask / how to structure questions in ways that elicit learners' existing knowledge
- Students have limited ability to communicate their thinking / don't explain all their thinking so it's difficult to infer the steps they took immediately preceding the reasons they give
- I don't know what to do/say when a student says something unpredictable that throws my thinking about what s/he's doing and can do
- Students think very differently from each other – with such a large class size it is difficult to diagnose all their starting points – I can only identify and build on a few
- I feel too constrained by the requirements of the curriculum/the need to get students through examinations
- I don't feel I have a deep enough knowledge of the subject/topic I am teaching (e.g. fractions, electricity, narrative writing) to help me infer reasons for students' answers
- I'm not confident about being able to adapt the curriculum to respond to different starting points

(These statements were identified from the study by Norton and McCloskey (2008): Teaching experiments and professional development *Journal of Mathematics Teacher Education* 11, pp. 285-305)

Question 2

Under challenge and over challenge: there is some evidence that teachers choose to avoid the risk of over-challenging learners. What can we learn about the risk assessments that teachers make and how teachers are setting about managing these risks?


1. Facilitator to explain that we want to test a finding from our literature review about challenge **that teachers are more concerned about over-challenging than under challenging** by asking the participants to brainstorm in pairs what could go wrong (i.e. the risks) if they were to over challenge learners and record their ideas on post its.
2. Facilitator to gather in the post-its and group them if there are a lot (with the help of the participants) into similar types.
 - Go through each of the identified risks or types of risk in turn (starting with the risks most frequently commented upon) and ask for an example
 - Participants to say what they might do about each risk.

Question 3

Knowing when to step back and assume a more facilitative role: there is evidence that this is a difficult judgment for teachers. What do teachers see as the main problems and how can they be overcome?

Knowing when to step back and let learners work things out for themselves

1. Facilitator to offer each participant a wrapped chocolate from a box and ask the participants to ‘place their bet’ on the imaginary roulette board (a 4-point Likert scale). Placing their bet commits them for the duration of the activity to a particular viewpoint and the participants will be asked to justify the way they bet.

Easy to do	Knowing when to step back and let learners work things out for themselves 	Problematic
Very easy to do		Very problematic

2. Starting with the ‘problematic’ side of the scale the facilitator asks the participants who bet in that way to give their reasons / state what the problems are in their view. **Ask for examples to provide some context.**
3. Then the facilitator asks those who bet on the easy to do options to say why / how they find it easy to step back and let students work things out for themselves. How do they set it up – i.e. overcome potential problems? **Ask for examples to provide some context.**