EFFECTIVE PROFESSIONAL DEVELOPMENT
Guidance Report

About the Education Endowment Foundation

The Education Endowment Foundation (EEF) is an independent charity supporting teachers and school leaders to use evidence of what works—and what doesn't—to improve educational outcomes, especially for disadvantaged children and young people.

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FOREWORD

Supporting high quality teaching is pivotal in improving children's outcomes. Indeed, research tells us that high quality teaching can narrow the disadvantage gap.[1] It is therefore hugely encouraging to see a host of new initiatives and reforms that recognise the importance of teacher quality such as the Early Career Framework and the new National Professional Qualifications. These exemplify a growing consensus that promoting effective professional development plays a crucial role in improving classroom practice and pupil outcomes, and this guidance further reflects this, offering recommendations on how to improve professional development and design and select more impactful PD.

"We hope this guidance instils a closer focus on mechanisms and provides a new guiding set of principles to ensure that PD is as effective as possible in order to improve pupil outcomes."

PD has great potential; but it also comes with costs. We know that teachers engage in professional development activities whilst balancing multiple and, at times, competing commitments and time pressures. The need is clear, therefore, for PD to be well-designed, selected, and implemented so that the investment is justified.

To date, the research evidence has failed to provide a set of clear principles for how to design and deliver effective PD that improves pupil outcomes and ensures this investment is worthwhile. While reviews have pointed towards potentially impactful traits of professional development, conflicting findings and loose definitions have made providing clear guidance challenging.[2] This guidance is underpinned by a new review of evidence that seeks to move the evidence-base forward. It points to the role of *mechanisms* within professional development, the crucial elements that cause impact, and this guidance explains the impact these mechanisms may have, and how they may be incorporated into effective PD design. These findings offer valuable new insights that are not only important for the research community but also practically helpful for those who design and select PD.

This guidance will support schools in selecting external PD and designing and delivering their own PD as well as external providers in designing, delivering, and explaining their offering to schools. This guidance is also supported by a review of practice that reiterates the importance of good implementation and consideration of the school context.

Professor Becky Francis
Chief Executive
Education Endowment Foundation

What does this guidance cover?

Teachers make a difference. No matter the phase or school setting, it is the quality of teaching that can make the biggest difference to children's learning and to their ultimate success in school. As Rauch and Coe explain, it is 'arguably the single most important thing that teachers and school leaders can focus on to make a difference in children's learning'. What's more, the quality of teaching is not fixed: teachers can be improved, and they can be improved via effective professional development.[3]

Ensuring that teachers are provided with high quality PD is therefore crucial in improving pupil outcomes. However, to date, we have lacked clear answers on exactly how PD should be delivered.[4] As Mary Kennedy has explained, 'Education research is at a stage in which we have strong theories of *student* learning, but we do not have well-developed ideas about *teacher* learning.'[5] In addition, its quality in practice varies. A third of teachers in England typically take part in PD at least once a week but only 38% of teachers surveyed in

October 2018 agreed that 'time and resource allocated to professional development are used in ways that enhance teachers' instructional capabilities'. Moreover, substantially fewer classroom teachers (29%) agreed with this statement compared to headteachers (73%).[7]

This guidance report aims to address these problems by providing clearer guidance on what might work when designing and selecting PD with a view to improving PD practice and subsequently improving outcomes for children. It is based on a new, robust review of the evidence led by Sam Sims, Harry Fletcher-Wood, and Alison O'Mara-Eves which reviewed 104 evaluations of PD programmes from 2002 to 2020. The guidance also draws from the expertise of an advisory panel of current practitioners and academics including Helen Bellinger, Rob Coe, Phillipa Cordingley, Thomas Martell, Emily Perry, Sarah Seleznyov, and Adrie Visscher. A review of current practice, led by John Higton of CFE research, also informs the recommendations.

INTRODUCTION

Who is this guidance for?

This guidance is intended to support those who design and select professional development aimed at improving the attainment of pupils aged three to 18. Schools, early years settings, further education practitioners, and external PD providers will all find the recommendations useful, particularly senior leaders, departmental leads, and programme designers. While most of the evidence is not drawn from a special school context, many of the messages are, nevertheless, still likely to be useful and relevant for teachers in special schools.

The guidance does not provide advice on how to improve initial teacher training. Rather, it is focused on how to improve professional development for in-service teachers. The guidance also does not cover training for teaching assistants; instead, this is featured in the Making Best Use of Teaching Assistants guidance report. Additional audiences who may find the guidance relevant include governors, policymakers, and education researchers.

The guidance should be read in conjunction with other EEF guidance reports. Some of these—such as those based on literacy, maths, or science—provide subject and phase-specific recommendations on how to improve practice, whereas others offer guidance on universal themes—such as feedback, metacognition, and parental engagement. The guidance also sits alongside the EEF's '*Putting Evidence to Work: A School's Guide to Implementation*', and updates its messages on professional development. The implementation guidance also provides a range of other strategies to support effective implementation in schools.
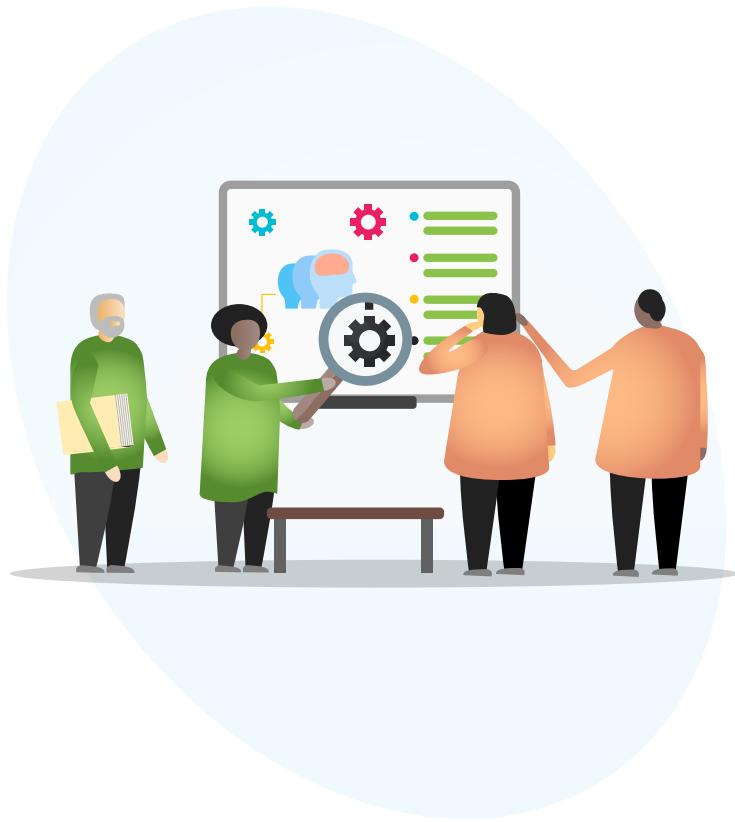
What is professional development?

'PD' may take a variety of different meanings in different contexts. In this report, we define teacher professional development as **structured and facilitated activity for teachers intended to increase their teaching ability.**[8] The emphasis on 'teaching ability' is key:

- The focus on teaching is intended to include a broad range of skills including communicating and modelling language, exploring ideas, instruction, and assessment. It excludes education technology programmes with only a very brief, token training element on how to use that specific tool.

- The focus on ability rather than merely teaching knowledge is intended to distinguish PD from new curriculum programmes with only a brief, token training element. In addition, it distinguishes PD from activities focused on simply providing teachers with general updates about school or setting business or policies.

This provides a narrow yet focused definition that perceives PD as structured activities aiming to improve outcomes in the classroom. **Box 1** provides further explanation of this definition.

Box 1: What is PD?

Professional development *is*...	Professional development *is not*...
School-wide, monthly twilight sessions on how to improve formative assessment in the classroom.	A briefing provided to practitioners on how to use new smartboards.
A training day provided by a nursery school headteacher on how to use strategies to improve children's language.	An information session for teachers on the new school admissions code.
A series of online webinars delivered by an external provider on how to improve behaviour management in the classroom.	Teachers receiving a new curriculum programme via email, complete with schemes of work and assessment materials.

SUMMARY OF RECOMMENDATIONS

1

When designing and selecting professional development, focus on the mechanisms.

- High quality teaching improves pupil outcomes, and effective professional development offers a crucial tool to develop teaching quality and enhance children's outcomes in the classroom.

- To improve pupil outcomes, careful attention should be paid to how PD is designed. In particular, those who design and select PD should focus on mechanisms.

- Mechanisms are the core building blocks of professional development. They are observable, can be replicated, and could not be removed without making PD less effective. Crucially, they are supported by evidence from research on human behaviour—they have been found, in contexts beyond teaching, to change practice.

- Examples of mechanisms include revisiting prior learning, goal setting, providing feedback, and action planning.

- Those who select PD should look for mechanisms in prospective programmes; those who design PD should include mechanisms in their design.

- Careful consideration is also required to ensure that PD is evidence-based, and that content is drawn from trusted sources.

2

Ensure that professional development effectively builds knowledge, motivates staff, develops teaching techniques, and embeds practice.
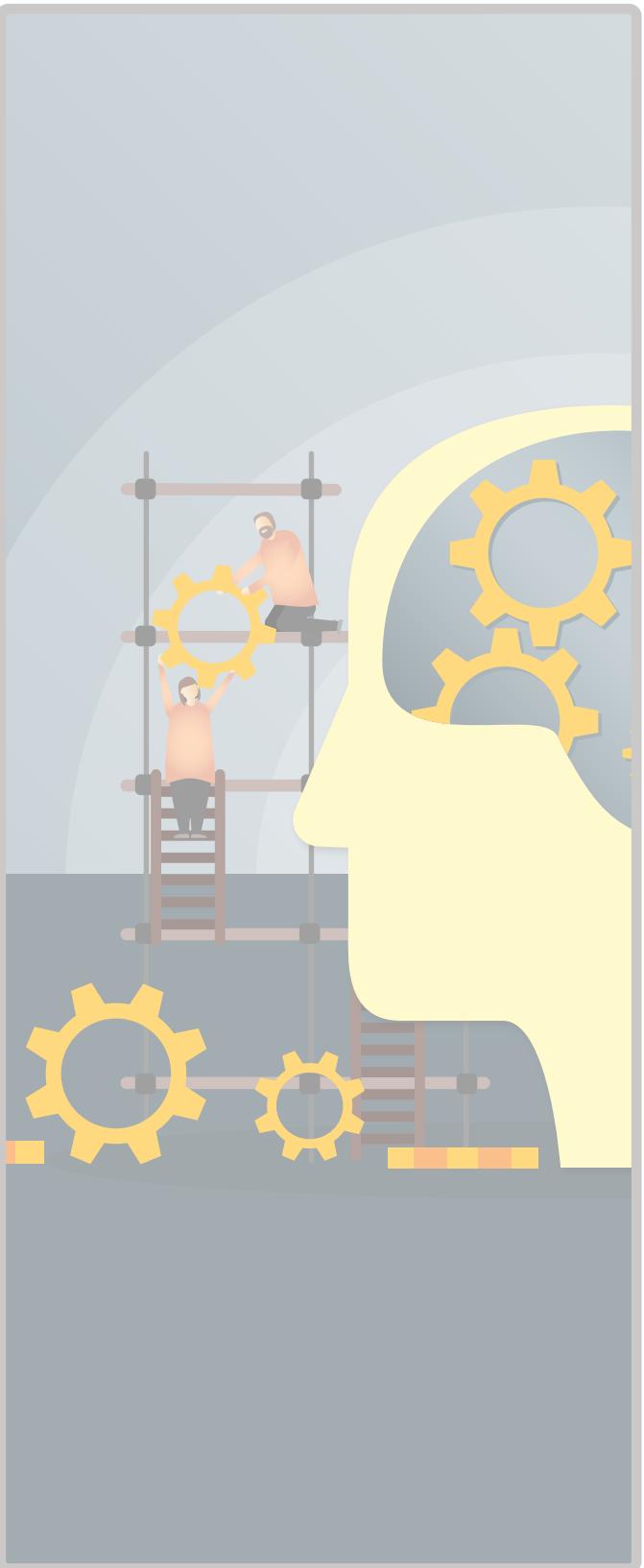
- The mechanisms that make up effective PD can be split into 4 groups, each of which fulfils a different role.

- PD may aspire to include a mechanism from each of these groups:

A. *Build knowledge*
   - Managing cognitive load
   - Revisiting prior learning

B. *Motivate staff*
   - Setting and agreeing on goals
   - Presenting information from a credible source
   - Providing affirmation and reinforcement after progress

C. *Develop teaching techniques*
   - Instruction
   - Social support
   - Modelling
   - Monitoring and feedback
   - Rehearsal

D. *Embed practice*
   - Providing prompts and cues
   - Prompting action planning
   - Encouraging monitoring
   - Prompting context specific repetition

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3

Implement professional development programmes with care, taking into consideration the context and needs of the school.

- Provide guidance on how participants can adapt professional development. Programme developers should signal to those selecting and delivering PD programmes where adaptations can be made, ensuring that the mechanisms are protected and prioritised.

- Ensure that professional development aligns with the needs of the school and is supported by school leadership. Gaining ongoing leadership buy-in can facilitate successful implementation.

- Recognise the time constraints faced by teachers and adapt professional development accordingly. Those designing and selecting PD should critically assess how a PD programme will fit in with the school routine.

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1

When designing and selecting professional development, focus on the *mechanisms*

Aleena is the headteacher of an all-through school who is determined to improve outcomes for children. She identifies professional development as a pivotal tool to do this so spends time researching different PD programmes and approaches. She attends conferences, conducts online research, reads evidence summaries from several trusted sources, and speaks to local headteachers.

One colleague at a conference suggests using a particular programme to improve Key Stage 2 pupils' reading outcomes. A local headteacher that Aleena consults explains how their school has embedded 'instructional coaching' throughout their PD activities. An evidence summary that Aleena reads also suggests a variety of general principles that PD should adhere to—such as ensuring teachers 'collaborate'.

This leaves Aleena with a mass of new information and potential opportunities. However, she remains unsure of how to proceed. The Key Stage 2 reading programme looks promising but won't meet the needs of all of her teachers. 'Instructional coaching' sounds exciting but it's difficult to get a clear grasp on exactly what this is and how it is delivered effectively. In addition, the general principles suggested by the summaries Aleena has read have not provided explicit, clear guidance on how to design and select the most effective PD.

Aleena therefore asks herself:

- *'When selecting PD programmes, or designing my own PD, what should I be focusing on?'*

The impact of professional development

High quality teaching improves pupil outcomes and effective professional development offers a crucial tool to develop teaching quality and subsequently enhance children's outcomes in the classroom. Indeed, the review underpinning this guidance found that professional development, on average, has a positive effect on pupil attainment across early years, primary, and secondary contexts.[9]

Professional development may also prove to be a particularly cost-effective strategy when aiming to improve children's outcomes. As James Zuccollo and Harry Fletcher-Wood note, the impact of high quality PD on pupil attainment compares to the impact of having a teacher with ten years experience rather than a new graduate. PD can also have similar attainment effects to those generated by large structural reforms, and while other intensive interventions may have a larger impact on pupil attainment (such as one to one tutoring), these interventions tend to be far more expensive.[10]

When designing and selecting professional development, however, knowing the impact of *all* PD is not necessarily that useful. It's like having an ailment and knowing that *all* medicines, on average, have a positive impact; it is more useful to know which specific medicine to opt for. This is particularly important when designing and selecting PD due to the varied effects that PD can have. While the average impact of PD is positive, the effects vary from very positive impacts on pupil attainment to negative impacts. So how can we make sense of this variation? Exploring the 'mechanisms' that make up PD is a good place to start.

Forms, programmes and mechanisms

PD may be thought of in three ways: forms, programmes, and mechanisms.[11] Defining these concepts in relation to each other allows us to draw out the key concept that may be the focus of good PD: mechanisms.[12] (See **Table 1**)

Table 1: Forms, programmes and mechanisms

Forms	Programmes	Mechanisms
Description		
A PD form is a type or category of PD. They are defined by a set of common characteristics.	*PD programmes are specific sets of activities and materials which are associated with specific people or institutions.* *Activities are sometimes clearly specified in a manual and resource pack, while the programme may have a specific brand name.*	*The core building blocks of a programme.* *They are observable, can be replicated, and could not be removed without making that PD less effective.* *Crucially, mechanisms are supported by evidence from research on human behaviour- they have been found, in contexts beyond teaching, to change practice.*
Examples		
Instructional coaching: experts working with teachers to discuss classroom practice on a one-to-one, regular, and sustained basis. Experts may observe the teacher in action, before encouraging focused practice of specific teaching skills. **Lesson Study**: observation of live classroom lessons by a group of teachers who collect information on teaching and learning and collaboratively analyse and discuss it **Teacher learning communities (TLCs)**: where teachers come together in groups, over time, to discuss and analyse practice, aiming to gain new knowledge and skills.	**Embedding Formative Assessment (EFA)** Developed by Wiliam and Leahy in partnership with the Schools, Students, and Teachers network (SSAT), EFA aims to improve pupil outcomes by embedding the use of five formative assessment strategies. Schools receive detailed resource packs to run monthly teacher-led workshops on formative assessment.	**Goal setting**: as part of the PD, teachers set and agree a goal. **Feedback**: The PD monitors and provides feedback to teachers and practitioners. **Action planning**: Teachers are prompted to conduct detailed action planning to ensure they change their practice. See a full list of mechanisms on **p.29**.
Is this a useful way to think about PD?		
Setting out broad types and categories of PD could be useful in providing schools and PD providers with different types to use. However, unfortunately, these forms are rarely clearly and consistently defined. For example, some argue that TLCs must include an analysis of pupil work, others not. Some argue that Lesson Study requires expert advisors; others not. When delivering instructional coaching, some encourage teachers to rehearse skills outside of the classroom; others in the classroom. This can create confusion and considerable overlap between forms. It can make it very challenging for leaders like Aleena to easily adopt them into their own context. So perhaps thinking about programmes is more conducive?	Identifying effective PD programmes can be very useful; they can be easy for schools to buy and deliver straight 'off the shelf' and may come with clear instructions. However, effective programmes may not be available to every school that wishes to buy them (due to resource constraints or geography). Programmes may also not be available to meet every need a school has. When external programmes are not available, school leaders can consider what mechanisms may be useful during their own PD design process.	Mechanisms provide exact, clear, building blocks for professional development. Those who design PD may adopt and use them, while those selecting PD programmes may look for them in potential programmes.

The importance of mechanisms

A key finding of the review underpinning this guidance was that the more mechanisms a PD programme had, the greater the impact on pupil attainment. The more 'building blocks' incorporated, the better the chance of success.

This does not mean to say that different forms are ineffective. But whatever form is being delivered, the more mechanisms that are included the more likely that it will positively impact pupil outcomes. It therefore makes most sense to focus on these mechanisms, which may be the determinants of success.[13]

In terms of programmes, it remains extremely useful for schools to purchase evidence-based, high-quality interventions that have been shown to improve pupil attainment. However, where these may not be available, focusing on ensuring the PD you design and select includes as many mechanisms as possible is a good bet.

The toothpaste analogy

A useful way to think about mechanisms is to think about toothpaste.

You're able to purchase a range of different toothpastes. There are different types, such as toothpaste targeted at whitening, or toothpaste targeted at reducing sensitivity (i.e forms); and there are different brands (i.e programmes) with very specific ingredients from specific companies.

However, the key mechanism that you will want in any toothpaste you use is fluoride, the specific, replicable, observable ingredient that prevents cavities. A toothpaste is more likely to be effective in reducing cavities if it includes fluoride.

When designing and selecting PD, we're looking to identify and incorporate the 'fluoride', the mechanisms that are likely to alter teacher practice and improve pupil outcomes.

The content of PD

An important caveat to encouraging a focus on mechanisms is that those who design and select professional development should still pay close attention to the content of PD. PD designers and commissioners should ensure that teachers are provided with evidence-based content.

There are a variety of trusted sources that offer resources to draw content from, or check content against, including:

- EEF guidance reports and reviews;

- the EEF Teaching and Learning Toolkit (which should act as a starting point, to then be built upon); and

- trusted brokers of evidence such as the Chartered College of Teaching, the Early Intervention Foundation, IES's What Works Clearinghouse, Deans for Impact, and Evidence Based Education.

A range of other trusted sources may include individual EEF studies (or other experimental studies), systematic reviews or summaries of evidence, and reviews of practice. The reference lists in the Early Career Framework and National Professional Qualification Frameworks also provide a useful starting point for exploring other resources in specific areas.

The Early Career Framework

The Early Career Framework (ECF) summarises the key knowledge and competencies that those entering the teaching profession should look to master. The contents of the framework—broken down into 'learn that' and 'learn how to' statements—are founded on a body of trusted sources of research evidence, all of which are cited within the framework itself. The statements focus on a range of topics from maintaining high expectations of pupils to using assessment effectively and providing high quality feedback.

Teacher training programmes have been developed from the ECF, the materials of which are publicly available via the Department for Education. These materials underpin a new entitlement for early career teachers to a structured two-year package of high quality professional development, replacing the existing one-year 'newly qualified teacher' induction.

National Professional Qualifications

National Professional Qualifications (NPQs) are a suite of training programmes accessible to teachers looking to further their expertise in school leadership or specialist areas of practice. The available programmes are Leading Teacher Development, Leading Teaching, Leading Behaviour and Culture, Senior Leadership, Headship, and Executive Leadership.

As with the Early Career Framework, the NPQ programmes are built on the contents of frameworks underpinned by a body of trusted sources of research. In addition to highlighting knowledge and skills that are integral to effective teaching and learning, some frameworks also include topics such as 'governance and accountability' and 'implementation'.

2 Ensure that professional development effectively builds knowledge, motivates, develops techniques, and embeds practice.

Darrell is a primary senior leader who has designed a range of PD programmes for teachers in his school. In all of these programmes, the central aim is to improve the outcomes of children in the classroom and to do this Darrell aims to ensure that all the training is founded in evidence. Consequently, he has conducted extensive research and is aware of the current debates surrounding the design of PD.

This research introduces Darrell to the concept of 'mechanisms'. He is excited to adopt as many as possible and use them throughout the programmes he designs and delivers. He recognises their potential in providing replicable, clear, and explicit building blocks. However, before designing new PD, Darrell requires more information.

Darell therefore asks himself:

- *'What exactly does each mechanism entail, and should I use a particular combination of them?'*

The more mechanisms professional development includes and effectively implements, the larger its likely impact on pupil attainment.[14] But what exactly do they entail, and how may they be ordered? The review underpinning this guidance identified 14 mechanisms, which may be split into four groups relating to the need to:

A. **BUILD KNOWLEDGE**
B. **MOTIVATE TEACHERS**
C. **DEVELOP TEACHING TECHNIQUES**
D. **EMBED PRACTICE**

In this recommendation, we will describe the mechanisms in these groups. This will support those who design PD to incorporate them into their practice. It will also support those who select PD to look for them when selecting a programme.

A. BUILD KNOWLEDGE

When designing and delivering PD, it is likely to be important to present new knowledge in ways that support understanding. As any teacher would with their own class, PD facilitators must pay close attention to how they structure and build the knowledge taught through the programme. Specifically, two mechanisms that are likely to improve PD are (1) managing cognitive load and (2) revisiting prior learning.

Mechanism 1: Managing cognitive load

When presenting new information as part of professional development—when teaching teachers new knowledge—careful thought should be applied to managing the cognitive load of participants. To avoid 'overloading' participants, programme developers and deliverers should either:

- remove less relevant content;

- focus only on the most relevant content;

- vary their presentation via the use of multiple examples; or

- employ strategies such as dual coding—the combination of verbal and visual instruction.

These strategies will support in managing the cognitive load of the participant.

As Sweller et al. (2019) explained, 'Human cognitive processing is heavily constrained by our limited working memory, which can only process a limited number of information elements at a time.'[15] Strategies that reduce the strain on these processes, which reduce the burden on teachers' thinking, can promote better learning.

The review of practice that supports this guidance identified examples of teachers using such strategies. As one primary headteacher indicated, the approach their PD takes is a 'drip-feed approach', where the amount of content is reduced and combined with examples and modelling to ensure that teachers can incrementally build knowledge.[16]

Mechanism 2: Revisiting prior learning

Another important consideration when structuring the knowledge taught to teachers in PD is the relationship with previous and future learning. PD is more likely to be effective where designers:

- revisit previous topics or techniques later in the programme;

- quiz participants on information provided in past sessions; or

- use tasks that require teachers to draw on past learning.

This draws upon research relating to retrieval practice, which theorises that recalling information makes it more likely that the learner will retain the learning.

"Topics are repeated about four weeks later and then four weeks after that. It's like, 'Do you remember why we do this? How has that happened? How have you found it? What problems have you found?' That's when we talk through [with the teachers]. We're deliberately going back over it."

Secondary school senior leader describing how they revisit prior learning when delivering PD content[17]

"I think you do have to recycle things that you've previously taught, definitely, because people forget. You get so many new ideas that some of the really good stuff gets left behind."

Early years and primary senior leader explaining the importance of revisiting prior learning[18]

The underpinning review identified this practice in a range of PD programmes, one being the Pacific CHILD programme. A U.S. PD programme, the Pacific CHILD programme provided 42 days of PD over two years to Grade 4 and Grade 5 English teachers in order to improve English language development. The programme had a positive impact on both reading comprehension scores and teacher knowledge and practice. Exemplifying this mechanism, the programme developers delivered a 'spiral curriculum' where teachers revisited the content in greater depth over the course of the two years.

Case study: *Building knowledge—English Mastery*

English Mastery is a curriculum and professional development programme that aims to train secondary English teachers to better teach English and use assessment effectively. Participating teachers attend induction training, regular webinar sessions, 'Assessing for Mastery days' (where they explore comparative judgement assessment), and receive in-school visits and coaching to support their development and teaching practice in English. Teachers also have access to an online bank of resources and tools.

Throughout this training programme, designed and delivered by Ark Curriculum Plus, careful attention is paid to how knowledge is built and the programme facilitators use a variety of strategies to manage cognitive load and revisit prior learning. For instance, they:

- explicitly define the knowledge teachers will grapple with in each session;

- refine and adapt tasks to minimise the risks of tangents and misconceptions and ensure that teachers are predominantly thinking about the key learning in the session; as well as

- discussion, reflection tasks, and other activities, such as multiple-choice questions for frequent, low-stakes testing to revisit prior learning.

B. MOTIVATE TEACHERS

Once teachers have built knowledge (using a method that manages cognitive load and revisits prior learning), they still need to be motivated to act upon that knowledge, and that is where three mechanisms may be used:

- setting and agreeing on goals;

- presenting information from a credible source; and

- providing affirmation and reinforcement after progress.

Mechanism 3: Setting and agreeing on goals

Across a variety of behaviours, reviews have demonstrated that setting goals substantially increases the likelihood of behaviour change.[21] When conscious, specific, and sufficiently difficult goals are set, they make it more likely that performance will improve.[22] It may therefore be fruitful for professional development facilitators to set or agree upon specific goals for teachers to act on.

For example, at the end of a professional development session on how to use specific strategies to improve early literacy, the facilitator could ask all early years practitioners to set a goal to run a parental workshop on literacy that term. Alternatively, after providing feedback on a Year 8 science lesson they have just observed, a coach could ask a teacher to set a goal; their goal is to include more explicit modelling of their own thinking in the next lesson in order to advance learners' metacognitive knowledge.

Setting these conscious, specific, and sufficiently difficult goals makes it more likely that teachers will fulfil them.

Mechanism 4: Presenting information from a credible source

Where information is derived from impacts how motivated teachers are to use it. The more credible the source, the more likely they are to change their practice.[23] PD facilitators should, therefore, think carefully about how they present and make the case for a particular change in teacher practice. Useful methods that make teachers more likely to follow suit may include:

- supporting a suggestion with published and robust research;

- featuring a prominent education academic to advocate for a change; or

- using an expert teacher to promote a particular practice.

This, of course, links closely to the need to ensure that the content of PD is evidence-based (see **Recommendation 1**). Providing content from trusted sources (such as EEF guidance reports, published trials of interventions, or other evidence brokers) is likely to be more motivating than offering instruction based on anecdotal or unsupported impact statements.

Mechanism 5: Providing affirmation and reinforcement after progress

Providing affirmation and reinforcement after a teacher has made an effort to alter practice—or shown progress in performing a new skill—may improve teachers' motivation to act upon professional development. This should come after the change has been attempted (rather than before).[25]

> "We have a process where we use congratulation and recognition cards on our college intranet and if somebody has done something really well, normally one of our executives or a member of the senior leadership team will write a staff card to that person so that they can acknowledge their recognition and celebrate it with their peers."

Senior leader from an FE college describing how teacher development and progress is recognised and reinforced.[24]

Case study: *Motivating teachers—Embedding Formative Assessment*

Evaluated for the Education Endowment Foundation by Dr Stefan Speckesser, Johnny Runge, Francesca Foliano, Dr Matthew Bursnall, Nathan Hudson-Sharp, Dr Heather Rolfe, and Dr Jake Anders.

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Developed by Dylan Wiliam and Siobhan Leahy in partnership with the Schools, Students and Teachers network (SSAT), Embedding Formative Assessment is a professional development programme that aims to improve pupil outcomes by embedding the use of five formative assessment strategies across a school. Schools receive detailed resource packs to run monthly teacher-led workshops on formative assessment, known as Teacher Learning Communities, over two years and teachers conduct peer observations focusing on the use of formative assessment strategies. Ongoing leadership support and training for effective implementation of the programme is also provided by SSAT.

The programme uses a variety of strategies that motivate teachers to change practice. For instance, the programme designers were very aware of the importance of 'credible source' and so ensured that the research underpinning the programme was shared with teachers. The initial training day evaluated as part of the EEF programme also featured a speech from Dylan Wiliam, which was very well received and motivating. As the evaluation report explains, teachers who watched this speech highlighted—

> "the powerful and engaging presentation of the programme's strategies and the underlying research, which contributed to a high buy-in and enthusiasm among participants. Some lead teachers said this had given them the required confidence to sell the project to teachers in their school."

The EEF tested the impact of the programme in a randomised controlled trial in 140 secondary schools. Students in the Embedding Formative Assessment schools made the equivalent of two additional months' progress in their Attainment 8 GCSE score, and this result had a very high security rating. Analyses based on a smaller sample of pupils (and therefore less secure) found that pupils eligible for free school meals in schools that received the programme made one additional months' progress in their Attainment 8 score while the additional progress made by children in the lowest third for prior attainment was greater than that made by children in the highest third.[26]

C. DEVELOP TEACHING TECHNIQUES

Effective professional development is likely to provide teachers with the techniques they require to improve practice. Following building knowledge, and then being motivated to act upon it, these techniques will provide the tools required to take action and change practice.

The review underpinning this guidance identified five mechanisms that develop teaching techniques:

- instructing teachers on how to perform a technique;

- arranging practical social support;

- modelling the technique;

- providing feedback; and

- rehearsing the technique.

Mechanism 6: Instructing teachers on how to perform a technique

Of course, at the centre of any effective professional development programme there is likely to be the delivery of well-thought out, clear, and guided instruction, which supports teachers in developing effective techniques. As discussed in Recommendation 1, this should be underpinned by evidence and drawn from trusted sources.

For example, a PD programme supporting Key Stage 2 teachers to improve their maths teaching will provide information to teachers on how to better teach maths, fully explaining the concepts and procedures required. This may include instructing teachers how to use manipulatives and representations, how to teach strategies for solving problems, how to use assessment to build on understanding, and more.[27] PD programmes that incorporate clear and considered instruction on techniques are more likely to positively impact pupil attainment.

Mechanism 7: Arranging practical social support

In various contexts, both within and beyond teaching, peer support may support development. Peers often share a common language, culture, and knowledge regarding the problems they face and are often able to provide emotional or informational assistance that supports a trainee in improving their practice.[29] PD that arranges social support is, therefore, more likely to improve pupil outcomes and this could be offered using a variety of methods. For instance:

- support could be provided via a coaching relationship, where an expert coach provides peer support and assistance;

- it could be offered via regular conference calls between a number of participating teachers who could discuss how they are finding the PD programme and

- at the most basic level, it could just be a programme requiring at least two teachers from each school, phase, or department to participate in training so that, subsequently, these colleagues can support each other throughout.

"So, we take all our books down there, staff talk about what they've done so staff can showcase the work they've done and it just gives an opportunity for staff to say, 'well, we've been looking particularly at vocabulary—look at my history books, look at what I've done here' or 'I've got this great idea' and it's just a sharing type of activity really. That's been really effective."

Early years and primary senior leader describing the social support they provide as part of their PD[28]

Mechanism 8: Modelling the technique

Modelling is the provision of an observable sample of performance, either directly in person or indirectly (via film or pictures), for a teacher to reflect on or imitate.[31] This can support in learning a technique.

For example, in a professional development programme designed to improve teachers' behaviour management, teachers may be shown videos of how to establish effective routines at the start of a lesson or this may be modelled to them by an expert practitioner.

Learning from these worked examples provides opportunities for teachers to observe problems and their solutions before they face them themselves.

"Modelling is a real strength within the history team so we would use a teacher to lead delivery, to give examples, and work with staff to deliver that training. I think we find that it is more authentic if it comes from someone who is teaching a full teaching timetable.

There have been occasions, obviously, where if something is happening well within the history department, such as how we work with our disadvantaged students, we will then deliver sessions to the rest of the teachers in smaller groups. It will usually be subject leaders delivering the sessions, and they will give examples and model what has been done within the department."
Senior leader in a secondary school discussing the value of modelling by expert teachers in their PD[30]

Mechanism 9: Providing feedback

Monitoring the performance of participants and offering feedback to support their improvement may also support better professional development outcomes and subsequent pupil performance. Supportive observations, with formative feedback, should be clearly differentiated from notions of high-stakes lesson observations linked to appraisal targets.

Numerous reviews have demonstrated the variable impact that feedback can have but, on average, it is associated with a positive effect on performance.[32] It may therefore be fruitful to incorporate it into professional development by using coaches or peers, for instance, to monitor and observe performance before providing written or verbal feedback and then expecting the participant to act on the feedback to improve.

Mechanism 10: Rehearsing the technique

Prompt practice and rehearsal of a technique, at least once in a context outside of the classroom, may support teachers in enhancing their skills and embedding habits.[33] For example, as part of a training programme for teachers on how to improve the provision of feedback to pupils, teachers could conduct a role play exercise where they practice providing challenging verbal feedback to pupils.

Case study: *Developing techniques—Pickering Community Infant and Nursery School*
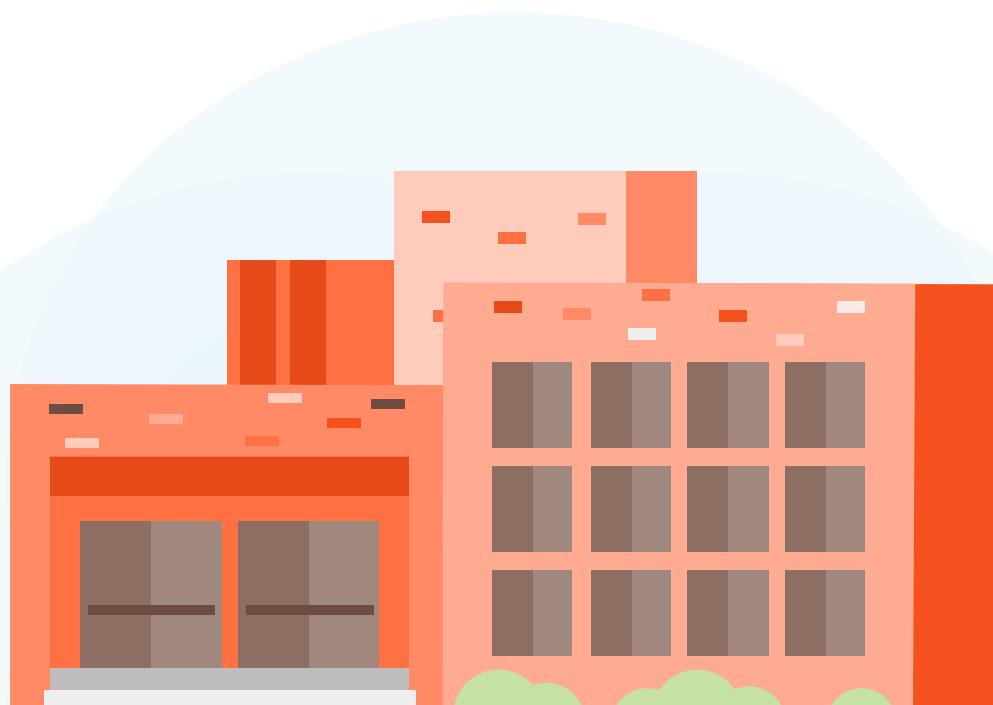
Providing high quality professional development with an emphasis on use and application of evidence has been a core feature of school improvement work at Pickering Community Infant and Nursery School.

A particular focus of their PD has been on improving the quality of adult-child interactions across Nursery and Reception. The PD has used a variety of mechanisms to develop practitioners' techniques to improve these interactions. For instance:

- **Modelling**—as part of training, an expert practitioner at the school modelled how to use the specific techniques of 'OWLing' (Observe, Wait, Listen) and 'Comment more, question less'.

- **Practical social support—**Early Years practitioners worked together in small groups, with the support of an expert member of the team to observe interactions between adults and children within the Early Years learning environment. The expert practitioner took on the role of coach to help colleagues make links between the training, the practical application in the classroom and what the impact of that was. Over time this support developed to focus more on the quality of the comments in developing language and sustained shared thinking.

One member of staff involved spoke of how the process so far had supported her in improving her practice. 'Working in this way', she explained, 'has been helpful because I find it easier to remember and understand if I can see something in action. It brought the PD to life and was easier to understand how it applies to my role and the work that I do.'

D. EMBED PRACTICE

Once teachers have built knowledge, been motivated, and been taught techniques, PD programmes then need to support teachers to effectively embed practice to ensure that they continue to change their behaviour and improve their teaching. Four mechanisms may be deployed to support this:

- Providing prompts and cues;
- Prompting action planning;
- Encouraging self-monitoring; and
- Prompting context specific repetition.

"I would say as well, a lot of the training, it's kind of relevant for that day and then it suddenly trickles away and it's lost in the noise, sort of thing. So, it has a big push on the day and then it fades and it's forgotten about."

Headteacher of an early years and primary setting noting the importance of properly embedding practice[34]

Mechanism 11: Providing prompts and cues

To ensure that teachers continue to alter and improve their practice, PD may choose to provide a series of prompts and cues that nudge and remind teachers to carry out certain behaviours.[35]

For example, having delivered an inset day and a series of webinars on how to embed metacognition and self-regulated learning into their curriculum and teaching, a PD trainer may prompt trainees with a fortnightly email or phone call to remind them to embed the lessons learned.

"We do that on probably a three-weekly basis or a monthly basis as well, so they have the PD but then we have these papers that get released or these research papers, and by papers I mean one page of A4 as a reminder—as a 'this is what we said, this is what to do, this is what it looks like in the classroom, and here's an example'. Then we keep all those examples on our intranet and we constantly refer back to them."

An external PD provider discusses the prompts they provide to participants after the training[36]

Mechanism 12: Prompting action planning

Action planning is where a teacher plans how they will perform a technique, and their plan includes at least one of the context, frequency, duration, and intensity of the technique. It can include lesson planning, where teachers may attempt to use a technique learned in PD, in a specific lesson.[37]

Producing an action plan makes it more likely that a teacher will use a technique they have learned during PD. It could be done in a variety of ways: for instance, as the final activity in a training session on improving secondary science teaching, participants could be asked to review the lessons they will deliver in the following week and identify where they can use models to help pupils develop a deeper understanding of scientific concepts.[38]

Mechanism 13: Encouraging self-monitoring

PD may be more effective if it establishes a method whereby teachers can monitor and record their own performance. For instance, teachers could be provided with reflective journals where they record their actions towards a specific goal and reflect on the success of them.[39]

As a more specific example, as part of a PD programme aimed at improving early maths teaching, teachers may be asked to deploy story books alongside mathematical talk in order to engage children in maths concepts.[40] Teachers could record when they do this, and their reflections on it.

Self-regulation theory posits that this type of recording and self-monitoring can make effective habit formation more likely—it forces teachers to pay specific attention to their actions and the effects of these actions.[41]

Mechanism 14: Prompting context-specific repetition

The final mechanism involves teachers rehearsing and repeating behaviour in the same context as it would usually be delivered—in the classroom. Repeating the same action in the classroom, at least twice, can support the embedding of practice.[42]

A teacher may, for example, receive training on how to deliver effective questioning in class. Ensuring that this is practiced, and repeated in the classroom, can help to embed a new, effective approach into a teacher's repertoire.

"That's the aim, isn't it? There's no point having the training if you're not seeing it in practice. It depends on what it is, but the techniques we're being taught— you'd expect them to be disseminated into the classroom."

Headteacher of an early years and primary setting discussing the value of practice in the classroom.[43]

Case study: Embedding practice—Manor Park Talks by Sheringham Childrens Centre [44]

Evaluated for the Education Endowment Foundation by Fatima Husain, Sarah Morris, Tanya Basi, and Tom Bristow.

Sheringham Nursery School and Children's Centre has been leading professional development programmes for local private and voluntary nurseries (PVIs) for many years, in its local neighbourhood of Manor Park (in Newham, London).

The Manor Park Talks programme, focused on supporting children's language and communication, included a strong focus on embedding practice. This was supported through:

Providing prompts and cues—the participants in the programme worked together to co-design a poster which summarised evidence-informed pedagogical techniques, like shared book reading. Reminders to refer regularly to the poster encouraged individual staff to continue using these techniques in their own practice.

Prompting action planning—each nursery in the project was given support to develop a brief action plan, focused on implementing the techniques from the poster. Peer support and management supervision meetings were used to support individual staff members in following the action plan.

Practitioners reported that they were 'more reflective of their own practice than before being part of the programme, finding opportunities for one-to-one interactions with children based on Manor Park Talks techniques'. There were indications that practitioners continued to deliver techniques they had learnt on the programme and that these were becoming embedded in daily practice.

Ensuring balanced PD design

The review underpinning this guidance[45] found early, tentative evidence that effective PD programmes are more likely to include a mechanism from all of the above four groups—building knowledge, motivating teachers, developing teaching techniques, and embedding practice. The authors suggest that a programme that features a mechanism from each of these areas represents a 'balanced design'. If one or more group is missing, the programme may fail for a particular reason, as summarised in **Table 2**.

Those who design PD may, therefore, aspire to include at least one mechanism from each of the four areas in their programme. Those who select and commission PD should explore potential providers to ascertain whether these mechanisms feature in their programmes.

Table 2: Ensuring balanced PD Design

Building knowledge	Motivating teachers	Developing teaching techniques	Embedding practice	Likely outcome
✓	✓	✓		If embedding practice is missing, a teacher may understand the content, be motivated to improve, and have the techniques to do so but—after a period of time—may revert to old habits.
✓	✓			When developing techniques and embedding practice are absent, this could lead to the 'knowing, doing gap'. Here, a teacher may be fully aware of what they need to do and be motivated to do it; unfortunately, they do not know how to do so, nor do they have the tools to deliver.
✓				Here teachers may have effectively built the knowledge but lack the motivation and skills to implement.
	✓	✓	✓	In this instance, while teacher motivation and implementation may be present, they may have misunderstood and misapplied the initial knowledge.
✓	✓	✓	✓	Where professional development features a mechanism from each group, it may be more likely to be effective.

A PD programme with a 'balanced' design

My Teaching Partner-Secondary programme (Allen et al., 2015) [46]

The My Teaching Partner-Secondary programme is a U.S. based programme, evaluated in 2015, that aimed to improve student-teacher interaction through offering teachers online coaching. The programme was generic, rather than subject-specific, and did not seek to improve teacher subject knowledge.

The core of the intervention was regular cycles of coaching. In each cycle, the teacher filmed a lesson and then a coach watched the video and highlighted the strong and weak elements of student-teacher interaction before the teacher watched the highlighted sections and met with the coach to discuss potential improvements.
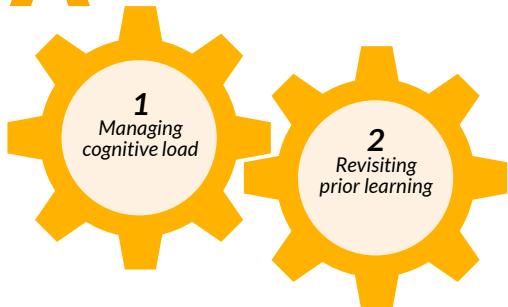
The programme resulted in substantial gains in student achievement across 86 secondary school classrooms involving 1,194 students, and these gains were demonstrated across subject areas.

The programme featured a 'balanced design' incorporating mechanisms from all four areas:

Building knowledge	Motivating teachers	Developing teaching techniques	Embedding practice
Coaches carefully managed cognitive load by only selecting certain video segments to review. The segments chosen were intended to emphasise specific dimensions of student-teacher interactions: relationships, classroom organisation, and instructional support. Coaches also revisited prior learning by focusing on each dimension more than once and revisiting each dimension in the second year of the programme.	The coach and the teacher set goals by agreeing ways to improve student-teacher relationships during their meeting. Coaches also encouraged teachers to keep pursuing successful actions via affirmation and reinforcement, highlighting teachers' strengths in the videos they reviewed.	During the introductory training session, teachers were introduced to the dimensions of high quality student-teacher interaction via high quality instruction. They were also shown modelling videos of effective teaching during this session and had ongoing access to a library of videos, annotated to highlight particular effective practices. Through highlighting videos and during meetings with teachers, coaches suggested areas of improvement via feedback.	Once the coach had watched the video, the teacher was asked to review the sections the coach had highlighted. Teachers were asked to observe and monitor their own behaviour and to consider the connection between their actions and students' reactions.

A BUILDING KNOWLEDGE

1 *Managing cognitive load*

2 *Revisiting prior learning*
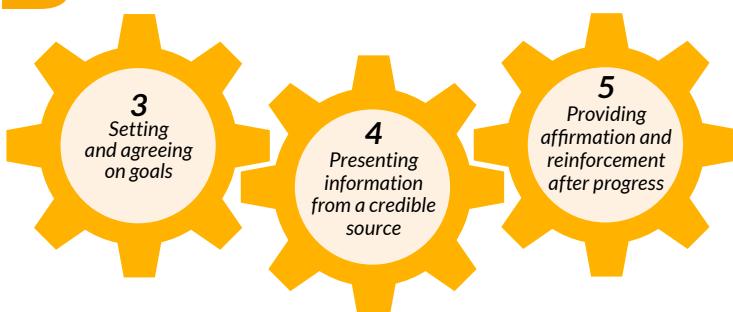
Reflection

Think about a PD programme that you have designed, selected, or participated in.

- Can you identify whether any of the 14 mechanisms were present?

- Can you identify where a mechanism could have been used to improve the PD?
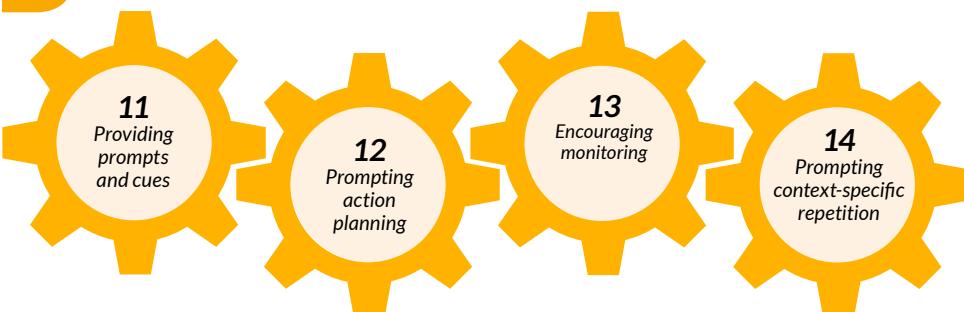
B MOTIVATING TEACHERS
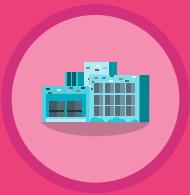
3 *Setting and agreeing on goals*

4 *Presenting information from a credible source*

5 *Providing affirmation and reinforcement after progress*

C DEVELOPING TEACHING TECHNIQUES

6 *Instructing teachers on how to perform a technique*

7 *Arranging social support*

8 *Modelling the technique*

9 *Monitoring and providing feedback*

10 *Rehearsing the technique*

D EMBEDDING PRACTICE

11 *Providing prompts and cues*

12 *Prompting action planning*

13 *Encouraging monitoring*

14 *Prompting context-specific repetition*

3 Implement professional development programmes with care taking into consideration the context and needs of the school

Sasha is a new head of department looking to introduce an evidence based professional development programme for teachers in her department. She has been interrogating programmes available to assess whether they include mechanisms that are likely to improve outcomes.

However, before she designs or selects new PD, she is keen to consider implementation. Sasha has participated in previous PD delivered in school, which has been well intentioned and, seemingly, evidence-based but was not executed well. Programmes did not always match the needs of the school, enjoy leadership support, or fit into the busy timetables of teachers. This makes her concerned about the reception of the next PD programme she selects.

Sasha therefore asks herself:

- *'What should I consider to ensure that professional development is effectively implemented in my school?'*

Ensuring that mechanisms are incorporated into professional development makes it more likely that the PD will positively impact pupil outcomes. However, when designing and selecting PD, the planning should not stop there. The implementation of professional development is also likely to make a substantial difference to the outcomes it achieves.[47] No matter how well thought out a PD programme is in terms of content and design, for it to succeed it needs to be feasible and appropriate to the school or setting context.

The implementation process from the guidance report '*Putting Evidence to Work: A School's Guide to Implementation'* can be a helpful starting point when considering implementation. But what other considerations need to be taken into consideration when delivering PD specifically? There are various contextual factors that may drive or constrain effective implementation of PD. This recommendation will explore the most critical factors.
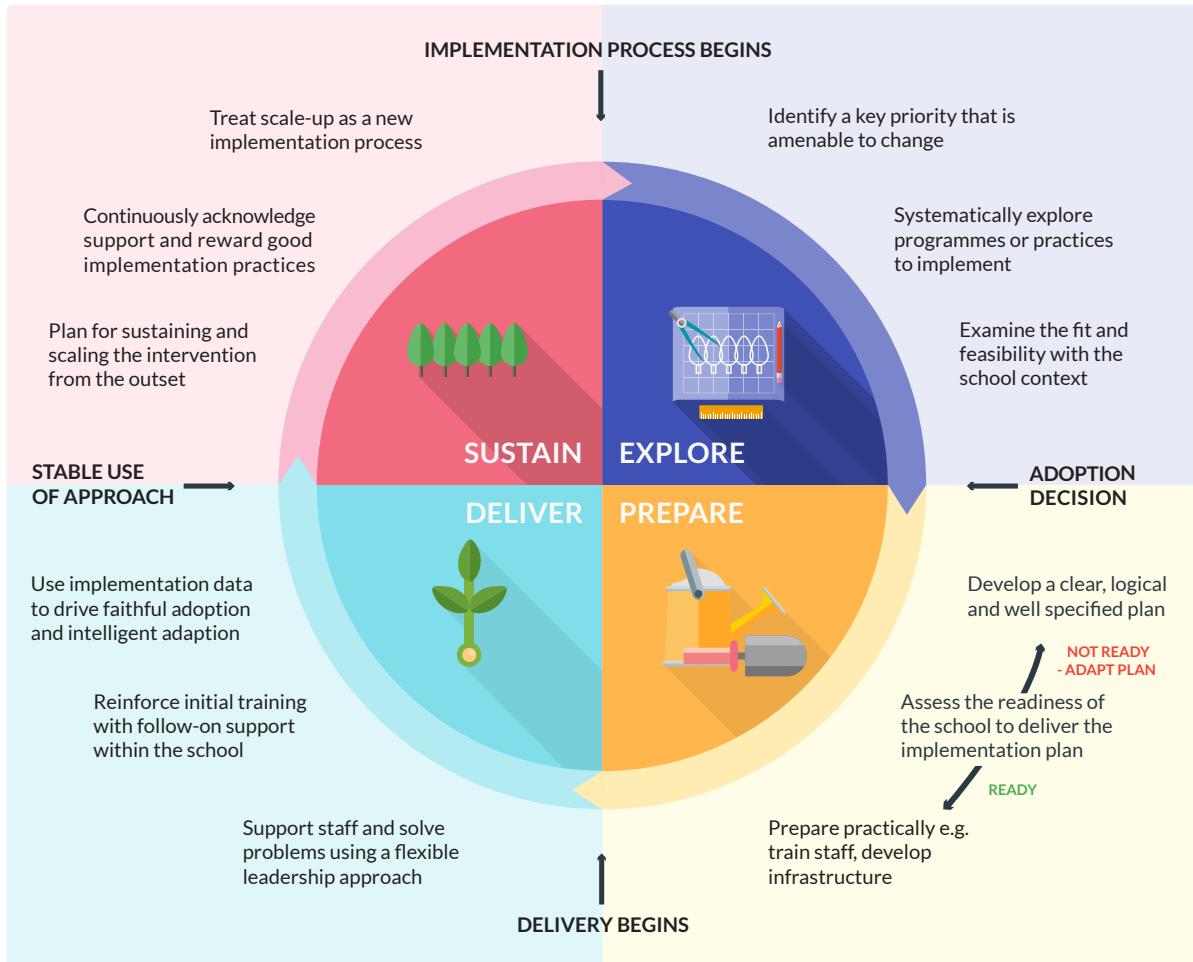
Those who design or select PD need to carefully consider how PD is intelligently adapted to suit the context it is delivered in. Moreover, consideration must be given to the alignment of the PD with school and setting priorities, ensuring that there is leadership buy-in and space for PD in teachers' busy routines.

The toothpaste analogy

If mechanisms are the equivalent of the fluoride in toothpaste—the element that makes toothpaste effective in reducing cavities—other contextual factors, such as alignment to school priorities, having leadership support, and the tailoring of PD to fit in with time pressures, are the mint flavouring: PD is made palatable and deliverable to the intended audience so that the mechanisms are given a chance to take effect.

Figure 1: The school implementation process diagram[48]

IMPLEMENTATION PROCESS BEGINS

Treat scale-up as a new implementation process

Continuously acknowledge support and reward good implementation practices

Plan for sustaining and scaling the intervention from the outset

Identify a key priority that is amenable to change

Systematically explore programmes or practices to implement

Examine the fit and feasibility with the school context

STABLE USE OF APPROACH

SUSTAIN

EXPLORE

ADOPTION DECISION

DELIVER

PREPARE

Use implementation data to drive faithful adoption and intelligent adaption

Reinforce initial training with follow-on support within the school

Support staff and solve problems using a flexible leadership approach

Develop a clear, logical and well specified plan

NOT READY - ADAPT PLAN

Assess the readiness of the school to deliver the implementation plan

READY

Prepare practically e.g. train staff, develop infrastructure

DELIVERY BEGINS

'One of the characteristics that distinguishes effective and less-effective schools, in addition to what they implement, is how they put those new approaches into practice.'

Putting Evidence to Work: A School's Guide to Implementation guidance report

Providing clarity on what to adapt

The general perception up until now has held that better implemented programmes (which usually means those that are faithful to the original model of implementation) tend to have greater impact.[49] However, there is a growing consensus that intelligent adaptation can increase the impact of a programme.[50] Adaptation can ensure that professional development better suits the context it is delivered in. So how should programmes be 'intelligently adapted'?

The review underpinning this guidance suggests that an adaptation is more likely to have positive effects where it makes small tweaks to tailor the programme to teachers' and students' needs or extends the programme.[51] Where an adaptation omits crucial elements of the programme, and particularly where it fails to incorporate the *mechanisms*, it is less likely to succeed.

It is, therefore, important to find a balance between fidelity to the original programme design and intelligent adaptation: the ideal is a **level of implementation that remains faithful to the mechanisms of the programme while also being contextually relevant and practical to implement**. However, programme guidance rarely specifies what can and cannot be adapted as part of a professional development programme.

Given the varied dynamics and challenges faced across schools and settings, those who develop PD should expect variation in delivery and should, therefore, identify and clearly signpost the type of adaptations that can be permitted and encouraged. This might even involve exploring the context of the school or setting on a more bespoke level as part of the design process or throughout the programme.

> *"Developers need to provide sufficient clear guidance about the purpose, goals and principles of the intervention, while maintaining the flexibility needed to ensure teachers can fit the intervention into their working patterns."*
>
> **Sims et al. (2021)**

Providing guidance on what can be adapted, while signalling clearly what the mechanisms are and their value to the programme, helps schools and settings implement effectively. Programme flexibility is also more likely to ensure leadership buy-in, which is also likely to be crucial for successful implementation.

> *"It's quite dynamic, the design of our training programmes. We don't sit still. We design, deliver, evaluate, tweak, and we're always thinking about the context we're delivering in. We might have a training module but, for example, an alternative provision setting comes to us and we will find out about the profile, and perhaps shine a spotlight on different priorities in the training. It's not about churning out the same thing each time."*
>
> **PD provider describing the design process of their programmes[52]**

> *"Anything that we do, we will always question it and we'll think how it's going to fit into our school, where I think a lot of schools unfortunately see the training and just think, 'We're going to do it fully. We're not going to think about our particular context.'"*
>
> **Headteacher of an early years and primary setting reflecting on the importance of adapting to the context[53]**

Alignment with the needs of the school or setting and support from leadership

PD is more likely to succeed when there is alignment between the aims of the programme and the priorities of the school or setting as well as support from leadership. At the same time, it is important to bear in mind that while alignment between an intervention and the school's or setting's current practice or aspirations are important for success, interventions that are too closely aligned will lack appeal as this may imply that there is little to learn.

Those who develop and select PD need to demonstrate its value to leaders, especially considering that often the decision to implement a specific programme will be driven by school and setting leaders. When a PD programme has leadership support, this allows teachers to prioritise the intervention and for resource to be dedicated to ensuring it is successful. Once secured, it is also important to maintain leadership support: clearly communicating what the requirements of the programme are and continually demonstrating its value can support with this. Programme providers may demonstrate value by helping teachers improve and by demonstrating this through case study examples of success.

More detail on building a leadership environment and school climate that is conducive to good implementation can be found in the EEF's guidance report *'Putting Evidence to Work: A School's Guide to Implementation'*.

"All staff have the same appraisal format and the same appraisal targets, so the CPD that we plan is linked directly to appraisal targets, and we have four focuses. And then staff can choose two of those, and we'd expect them to obviously reach that target by the end of the year."

Secondary senior leader describing how PD aligns with teacher appraisal targets[54]

"[Our PD] will usually be a whole-school need, so it will be something that perhaps is on the school development plan, or it might be that we've been on a subject leader course and actually we think that particular element would fit really nicely in our school.'

Early years and primary senior leader describing how the selected PD fits with a whole-school need[55]

Research in focus: The role of the leadership support in promoting teacher development

Kraft, M. A. and Papay, J. P. (2014) 'Can professional environments in schools promote teacher development?'[56]

While it is well established that, on average, teacher effectiveness improves with experience, there is large variation across individual teachers and across groups of teachers working in different schools. Much of the research that has shaped policy has focused on individual teachers rather than exploring the school context and its influence on teacher effectiveness. A study by Kraft and Papay published in 2014 examined the role of school context in explaining the variation in teacher improvement over time. They argue that the narrow focus on individual teachers ignores the role of the organisational context in which teachers operate, which shapes their career decisions and facilitates their success with students.

Their study analysed data from a district in North Carolina, one of the largest school districts in the USA, where teachers are largely representative of the country as a whole. Student achievement data was linked to teachers and then combined with data from the North Carolina Working Conditions Survey to look at the interaction between teaching experience and the professional environment, and its impact on student achievement in mathematics. The professional environment was measured based on the elements of order and discipline, peer collaboration, principal leadership, professional development, school culture, and teacher evaluation.

Their analysis found that teachers in some schools improved more and improved faster than teachers in other schools, with teachers improving at a much greater rate in schools with supportive professional environments. A key facet of this supportive environment was professional development—specifically, ensuring that leaders provided 'sufficient time and resources for professional development and use them in ways that enhance teacher's instructional abilities'. Evidently, ensuring leaders support PD is likely to support teachers in improving.

"The biggest pressure that obviously all teachers face is the volume of work they have to do just to do their basic job and when in that situation, quite often developing new skills and knowledge is not there at the top of your to-do list. If someone says, 'Oh, we've got a training day, you can either spend it marking your books or you can spend it going on this course', most teachers will go, 'Oh, I'm just going to mark my books.' So, you've got to engage them and make sure that they see the purpose in it."

FE senior leader describing the time pressures faced by teachers[62]

Time constraints and adapting accordingly

Those developing, selecting, and delivering PD should recognise that this takes place within the context of teachers working an average of 49.5 hours each week.[57] Schools and settings often allocate limited time for PD and any time given over to PD is potential time away from other activities seeking to improve pupil outcomes. Indeed, the review underpinning this guidance found that time was the most cited reason teachers gave for making adaptations to PD,[58] and this is unsurprising given that PD will require teachers to find time for additional planning and preparation, meetings and observations, or to attend training (all of which may require cover). Therefore, those developing, selecting, and delivering PD should consider time as a constraint and anticipate how the programme fits in with the school routine.

While it is important to consider time and make pragmatic adjustments in order to facilitate effective PD, those selecting PD programmes should also remember the importance of focusing on mechanisms over favouring a particular duration of programme. As Cordingley et al. explained, 'the crucial factor differentiating more from less successful programmes' is not simply the length of a programme, it is 'what the time is used for'.[59] Numerous reviews of professional development have failed to find a link between longer duration and greater impact,[60] suggesting that longer programmes are not necessarily more effective. In other words, schools shouldn't select PD based on the length of the programme on the assumption that longer equals better; once again, focus should be placed on the effective implementation of mechanisms.

Those who develop PD programmes must balance the desire to promote lasting and meaningful learning with the imperative to minimise the pressure they are placing on teacher time. Signalling where adaptations may be permitted without detracting from the mechanisms of a programme can allow schools and settings to implement programmes using their time strategically and efficiently.

> *"Three recent meta-analyses have found no link between longer professional development and impact—Basma and Savage, 2017; Kraft, Blazar and Hogan, 2018; Lynch et al., 2019)"*
>
> **(Zuccollo and Fletcher-Wood, 2020).[61]**

"We get 5 inset days of 6 hours. We release people if they're going off to external, but particularly that time to cascade information down, there's just not always the amount of time that people can do a quality job of cascading down. People are fighting for staff meeting slots all the time. They're forever coming to me going, 'Can I have a staff meeting slot?' I'm going, 'Well, you can, it will be July.'"

Headteacher of an early years and primary setting explaining that there is little time to disseminate learning from PD[63]

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