



Decomposition and recomposition: effects on novice teachers' enactment and transfer of behaviour management practices

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Foreword

The impact of effective teachers on the academic outcomes and life chances of young people is well-documented, and the role of teacher educators in developing the expertise of these colleagues cannot, therefore, be underestimated. Their work in enabling high-quality teaching practice is the very engine of school improvement.

Yet, only relatively recently have we begun to develop a body of knowledge which underpins the work of the most effective teacher educators. As the colleagues in school with the potential to influence the most teachers – and, subsequently, the most students – it is crucial they can work from a set of evidence-based practices.

For these reasons, this new research from Ambition Institute is an invaluable contribution to our understanding of how those responsible for the professional learning of our teachers can best aid their development. While this paper focuses on how early career teachers acquire and apply knowledge and understanding of behaviour management techniques, it has broader applications, and will be of great interest to anyone involved in coaching, mentoring or supporting colleagues to develop expertise in the classroom.

The wider implications of the research Ambition Institute present here come from one of the key findings about the relationship between decomposition and recomposition. Decomposition – the breaking down of teaching practices into manageable, bite-sized chunks – is now a common feature in coaching and mentoring early career teachers. However, there has rightly been increasing focus on the importance of contextualisation: how can we ensure colleagues are able to meaningfully adapt strategies and practices to suit their own students? This research suggests that the benefits of decomposition seem to depend on recomposition – the rebuilding of practices into meaningful sequences – to enable teachers to transfer and adapt their learning to live classroom environments. These findings reinforce the need for metacognitive approaches to professional learning, which value teachers as thinking professionals who become increasingly skilled in adapting evidence-based strategies to meet the needs of the children they teach.

It is therefore my pleasure to introduce this research from Ambition Institute. It is an important addition to our understanding of effective teacher education and to the professionalisation of teachers. It will be of real value to my work with our staff at the Greater Manchester Education Trust, and to all colleagues who are similarly privileged to contribute to the learning and development of our teachers: their work with and support for our young people has never been more important.

Sam Gibbs

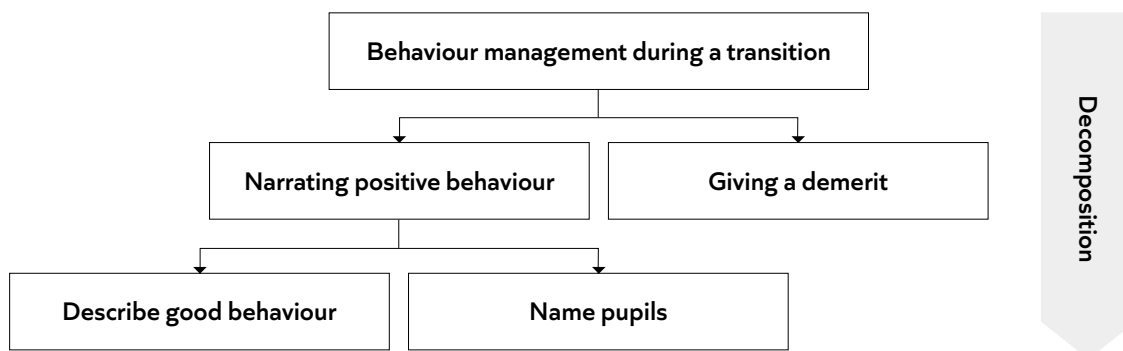
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What are decomposition and recomposition and why should teacher educators care about them?

The new Intensive Training and Practice (ITAP) element of initial teacher training requires teacher educators to break down (decompose) teaching into constituent practices. This is intended to make learning to teach more manageable for trainees. Instructional coaching also emphasises decomposing practice so that teachers and their coaches can focus on practising specific techniques. However, decomposing teaching in this way raises questions about whether teachers will be able to adaptively transfer what they have learned into the flow of classroom teaching. Teachers need to know when to use a certain technique, not just how to use it. This research looks at whether recombining the focal teaching practices into different sequences of teaching (recomposition) can help.

Decomposition is when a teacher educator breaks down sequences of teaching into constituent practices. For example, a teacher educator might observe part of

a lesson in which a teacher manages pupil behaviour while they get the class to transition from one activity to another. Providing feedback on the whole sequence at once might be overwhelming, particularly for a novice teacher. Instead, the teacher educator might break down (decompose) the sequence of teaching into constituent practices. A very simple example of this is shown in the graphic below. As shown, a teacher educator can break down a sequence to varying levels dependent on the novice teacher. This would allow the teacher educator to name each constituent practice. This helps draw novice teachers' attention to specific aspects of a practice, which may have gone unnoticed in the wider sequence. Decomposition would also allow the teacher educator to provide modelling, rehearsal and feedback on each constituent practice in turn. This would likely be more manageable than providing modelling, feedback and rehearsal on the whole sequence at once.



One risk with decomposition is that it decontextualises teaching practices, leaving teachers unclear as to when they should draw on a given practice. Returning to the example in the graphic above, teachers might become fluent in effectively narrating positive behaviour in their classroom and giving a demerit. However, they might be unclear as to when each of these would be the best response to pupil behaviour. Some teacher educators have therefore proposed that decomposition should always be combined with recomposition (Janssen et al., 2015).

Recomposition is when a teacher educator prompts a teacher to recombine the decomposed practices into new,

meaningful sequences of teaching. For example, it might make sense for a teacher to narrate the positive behaviour in their class as pupils begin to follow an instruction but then progress to give a demerit for one pupil that persisted in off task behaviour. In another classroom scenario, it might make sense for a teacher to start by giving a demerit for severe misbehaviour and then progress to narrating the positive as the rest of the class follow their instructions. **By recomposing teaching practices into such meaningful sequences, teacher educators are better able to explain why it would be appropriate for the teacher to use those practices at that point in the sequence.**

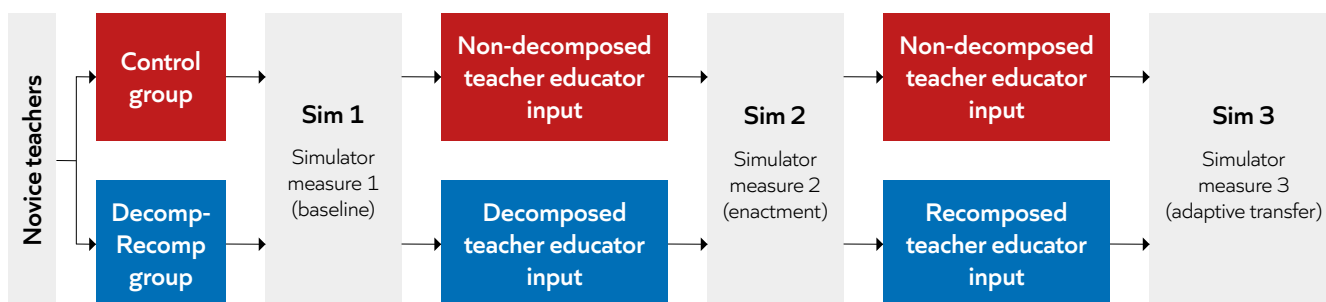
How did we research decomposition and recomposition in this study?

Ambition Institute set out to test whether decomposition-and-recomposition can support early career teachers in developing and adaptively transferring evidence-based teaching practices.

We recruited 144 initial teacher trainees and asked them to read an example school behaviour policy. The trainee teachers then took part in an online classroom simulator exercise. They were tasked with managing the behaviour of the pupils in the classroom as they led them through a transition from one classroom activity to another. We asked the initial teacher trainees to do this in a way that would minimise pupil time off task.

We randomly divided the 144 trainee teachers into two comparable groups. Both groups received input from a teacher educator. The first group always received input from a teacher educator on the whole, continuous sequence of teaching. The teacher educator did not decompose or recompose the constituent practices, so we refer to this as the 'Control' group. The second group received input from a teacher educator on a decomposed sequence and then on a recomposed sequence, so we refer to it as the 'Decomp-Recomp' group.

This graphic shows the overall design of the study:



Note. Sim = classroom simulator exercise. Decomp-Recomp = decomposition-then-recomposition.

Both groups first took part in the behaviour management exercise in the classroom simulator to determine a baseline (Sim 1).

They then received input from a teacher educator:

- > The **Control group** first received feedback on their attempt in Sim 1, followed by an explanation of how and when to use the constituent practices. The teacher educator modelled good practice and gave participants an opportunity to practice. **Crucially, this feedback, modelling and practice was on the whole continuous sequence of teaching. The constituent practices were not named.**
- > The **Decomp-Recomp group** also received feedback, modelling and practice. In contrast to the control group, the teacher educator **decomposed the sequence of teaching into constituent practices: naming each practice and providing feedback, modelling and practice on each practice in turn.** They also received an explanation of how to use each constituent practice but **not when to use them.**

Next, we asked all the trainee teachers to have a second attempt at the **same simulator exercise** (Sim 2) and measured how much they improved. The trainee teachers then received more input from a teacher educator:

- > As before, the **Control group** first received feedback on their attempt in Sim 2, followed by an explanation of how and when to use the constituent practices. The teacher educator modelled good practice and gave participants an opportunity to practice. **Crucially, this feedback, modelling and practice was on the whole continuous sequence of teaching. The constituent practices were not named.**
- > The **Decomp-Recomp group** also received feedback on their second simulator attempt, plus explanation of how to use the individual (decomposed) constituent practices. The teacher educator then **recomposed the constituent practices into a novel sequence of teaching: modelling the practices in a new context and in a different order. The teacher educator used the recomposition to explain when and why to use the constituent practices.** Participants then practised this whole, new sequence.

The table below shows the key differences between the inputs that novice teachers received:

	Control (non-decomposed)	Decomposed	Recomposed
Feedback, modelling, practice, and explanation of how and why (in theory) to use the practices	On a continuous sequence	On each practice in turn	On a continuous sequence
Explanation of when to use the practice	✓	✗	✓
Makes use of a novel sequence	✗	✗	✓
Constituent practices named	✗	✓	✓

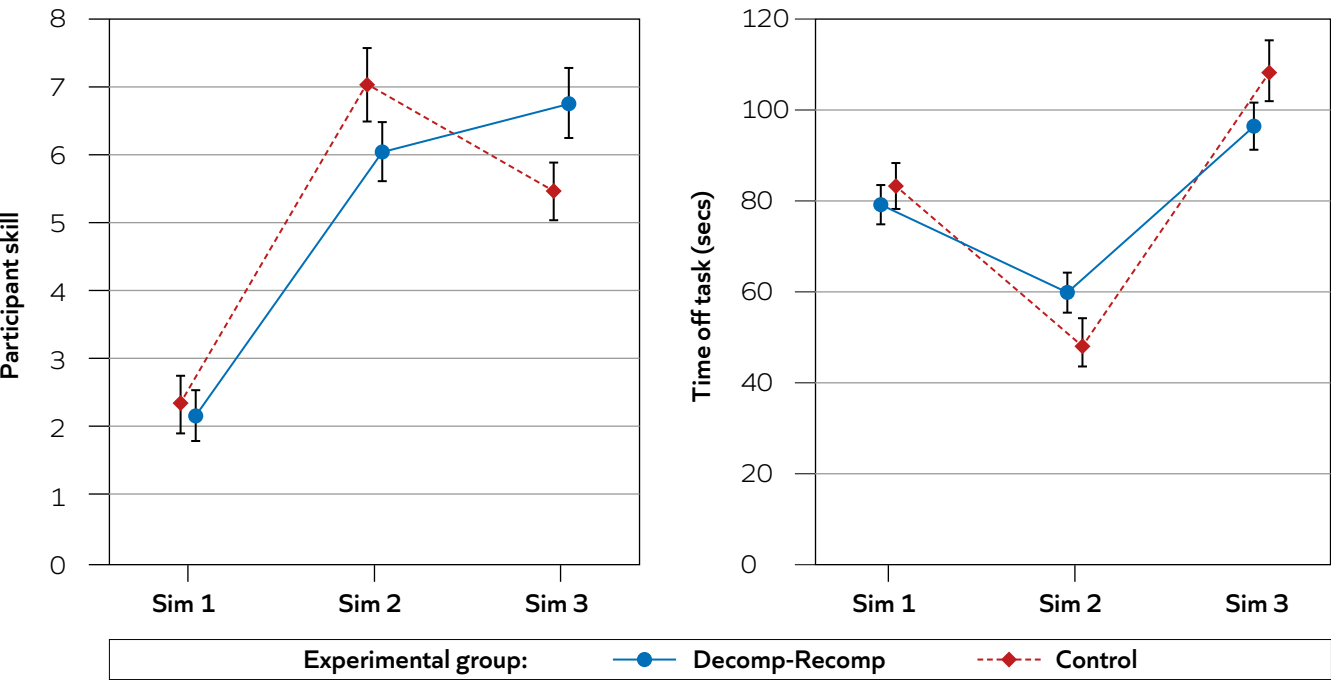
Finally, we asked all the trainee teachers to have a third attempt in the simulator (Sim 3). This simulator exercise was new for all participants. The trainee teachers had to apply the behaviour management practices in response to pupil

behaviour that they had not previously experienced and use them in a different order. The third simulator exercise therefore captured participants’ ability to adaptively transfer what they had learned.

What did we learn about decomposition and recomposition from this study?

This study provides the first causal evidence of the benefits of decomposition and recomposition for helping teachers enact and adaptively transfer teaching practices to novel classroom situations. We compared the Control and

Decomp-Recomp groups in terms of whether they used the right practices at the right time (‘participant skill’, left panel of the figure below) and how much time the avatar pupils spent off task (‘time off task’, right panel of the figure below).



In the left plot, higher participant skill reflects better performance. In the right plot, lower time off task reflects better performance. Both plots indicate the same pattern of results.

When we compared the outcomes in Sim 2 (requiring **no transfer**) we found that non-decomposed input from the teacher educator was superior to decomposed input. Trainees did a better job of enacting the practices and pupils spent less time off task.

When we compared the outcomes in Sim 3 (requiring **adaptive transfer**) we found that the results had switched: decomposed-then-recomposed input was superior to non-decomposed input. Trainees were better able to adaptively transfer the practices in a novel context.

What should teacher educators do differently as a result of this study?

Teacher educators should consider incorporating decomposition-and-recomposition whenever their goal is to support trainee teachers to adaptively transfer what they have learned back into real classrooms.

Recent reforms in England have made ITAP (Intensive Training and Practice) - which is built around the principles of decomposition and recomposition – a mandatory part of initial teacher training (DfE, 2021, p. 16). Our findings provide support for the theory underpinning this reform.

Wherever teacher educators use decomposition, they should consider accompanying it with recomposition.

Many practice-based teacher preparation programmes in the US are designed around careful decomposition (Grossman, 2018). However, these programmes place far less emphasis on recomposition. Our findings suggest teacher educators should use them together, to help novice teachers use the practices at the right time and for the right reason.

Our findings strengthen the rationale for coaching or mentoring approaches that employ cycles of classroom observation and out-of-classroom feedback, modelling and practice. Such a cyclical structure allows teacher educators to observe authentic teaching sequences in the classroom, decompose them with trainee teachers outside of the classroom, and then work with trainees to recompose them both outside the classroom and back in real classroom situations.

Our findings are also of relevance to debates about how best to design curricula for early-career teacher development. Teacher educators have historically swung back and forth between curricula built around larger, more authentic sequences of teaching and smaller, more granular breakdowns of teaching practice. Kennedy (2016) referred to this as a 'grain size problem'. Decomposition-and-recomposition provides a way around this problem by allowing teacher educators to flexibly decompose practice to whatever level suits their needs, and then recompose it into new meaningful sequences.

Caveats: While the participants in our study were in their first year of teacher training, we believe that this finding may also apply to early-career teachers more generally. Our findings apply primarily to aspects of teaching practice that require teachers to adapt in the moment, depending on the specifics of what is going on in their classrooms, like behaviour management or checking for understanding.

Department for Education [DfE]. (2021). *Initial teacher training (ITT) market review report*. <https://www.gov.uk/government/publications/initial-teacher-training-itt-market-review-report>

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Janssen, F., Grossman, P., & Westbroek, H. (2015). Facilitating decomposition and recomposition in practice-based teacher education: The power of modularity. *Teaching and Teacher Education*, 51, 137-146.

Kennedy, M. (2016). Parsing the practice of teaching. *Journal of Teacher Education*, 67(1), 6-17.



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