

Mastery learning

Moderate impact for very low cost, based on moderate evidence.



Mastery learning breaks subject matter and learning content into units with clearly specified objectives which are pursued until they are achieved. Learners work through each block of content in a series of sequential steps.

Students must demonstrate a high level of success on tests, typically at about the 80% level, before progressing to new content. Mastery learning can be contrasted with other approaches which require pupils to move through the curriculum at a pre-determined pace. Teachers seek to avoid unnecessary repetition by regularly assessing knowledge and skills. Those who do not reach the required level are provided with additional tuition, peer support, small group discussions, or homework so that they can reach the expected level.

How effective is it?

There are a number of meta-analyses which indicate that, on average, mastery learning approaches are effective, leading to an additional five months' progress over the course of a school year compared to traditional approaches. Unusually however, among the evidence reviewed in the Toolkit, the effects of mastery learning tend to cluster at two points with studies showing either little or no impact or an impact of up to six months' gain. This clear split and wide variation implies that making mastery learning work effectively is challenging.

Mastery learning appears to be particularly effective when pupils work in groups or teams and take responsibility for supporting each other's progress (see also Collaborative learning and Peer tutoring). It also appears to be important that a high level of success is set. When pupils work at their own pace, as opposed to working as a part of group or whole class, it appears to be much less effective (see also Individualised instruction). Mastery learning may also be more effective when used as an occasional or additional teaching strategy as the impact decreases for longer programmes of over 12 weeks or so. Schools may wish to consider using mastery learning for particularly challenging topics or concepts, rather than for all lessons.

Lower attaining pupils may gain more from this strategy than high attaining students, by as much as one or two months' progress, so mastery learning appears to be a promising strategy for narrowing the gap. However, it should be noted that teachers also need to plan carefully for how to manage the time of pupils who make progress more quickly.

How secure is the evidence?

Overall, the evidence base is judged to be of moderate security. There is a large quantity of research on the impact of mastery learning, though much of it is relatively dated and findings are not consistent. In addition, most meta-analyses examining mastery learning use statistical techniques which may inflate the overall effect size so some caution is needed in interpreting the average impact. Having noted these concerns, a more recent study in the US found that mastery learning approaches can increase learning by up to six months in maths for 13-14 year olds, which is consistent with several older studies.

In February 2015, the EEF published an evaluation of the Mathematics Mastery programme, based on two randomised controlled trials conducted in English schools. On average, pupils in classes where the approach was used made one additional month's progress compared to similar classes that did not. It is possible that this estimate is more relevant to English schools than some older studies. An alternative explanation is that the Mathematics Mastery programme did not include some of the features of programmes that were previously associated with higher impacts. For example, although additional support was provided to struggling students, classes did not delay starting new topics until a high level of proficiency had been reached by all pupils.

What are the costs?

Few additional resources are required to introduce a mastery learning approach. Professional development and additional support for staff is recommended, particularly in the early stages of setting up a programme. Estimates are less than £80 per pupil, indicating very low overall costs. Additional small group tuition and one to one support are also likely to be needed. This may not result in additional financial cost if schools use existing staff resources, but teachers should think carefully about the impact of this extra support in terms of the extra time and effort it will require.

What should I consider?

Before you implement this strategy in your learning environment, consider the following:

1. Overall, mastery learning is a learning strategy with good potential, particularly for low attaining students.
2. Implementing mastery learning effectively is not straightforward, however, requiring a number of complex components and a significant investment in terms of design and preparation.
3. Setting clear objectives and providing feedback from a variety of sources so that learners understand their progress appear to be key features of using mastery learning effectively. A high level of success, at least 80%, should be required before pupils move on.
4. Incorporating group and team approaches where pupils take responsibility for helping each other within mastery learning appears to be effective.