

BigKids: Choosing a Child's Next Exercise, Tested on Simulated Learners

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ABSTRACT

BigKids is a maths and English tutor for young children built around reasoning. Its tutor asks before it tells and never writes a child's sentence. This brief concerns the part that decides what a child does next. The planner was tested on simulated learners whose knowledge is visible, and scored on its own mistakes: lessons given out of order, exercises repeated too soon, runs of failure, and the share of exercises that ask for reasoning. Lessons given before the learner was ready fell by about three quarters, repeats fell by about a quarter, and the combined score moved from below zero to above it. Reasoning exercises remain only about a tenth of what a learner meets, and frustration is not yet low. No child's learning has been measured. The figures are in the full results paper, shared on request. The system is proprietary: nothing here says how a learner is modelled or how the next exercise is chosen.

1 The question

A child learns most from an exercise they will mostly get right with effort. A teacher finds it by watching. The question was how well a planner can find it from a child's answers alone, and how to tell a better planner from a worse one before any child uses it.

2 How it was judged

Simulated learners with known skills, their own pace and forgetting are taught for a run of days. The planner's mistakes are counted: a lesson given before the one it depends on; an exercise repeated too soon; a run of failures. Time near the right level of difficulty and the share of reasoning exercises count in its favour. One score combines them. The test is deterministic, so a change is judged on the same learners each time.

3 What was found

Table 1: Results in relative terms, on simulated learners.

Measure	Result
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Measure	Result
Lessons given before the learner was ready	about three quarters fewer
Exercises repeated too soon	about a quarter fewer
Combined score	from below zero to above it
Share of exercises that ask for reasoning	about a tenth; unchanged, and too low

The plan also reacts within a sitting when a learner begins to struggle or to coast.

4 Limits

The learners are simulated: the planner was improved against assumptions about how children learn, and no child's learning has been measured. One school year of maths is covered in depth. The tutor's behaviour was checked on scripted sessions. There is no comparison with another programme, and no result has been reproduced by a third party.

5 The figures

The measured counts are in the full results paper. It is shared on request to the author.