Stanford University/Rural Education Action Program

Evaluating the impact of computer-assisted instruction and learning in China

The use of information and communication technology (ICT) for teaching is a promising approach for improving learning outcomes, particularly for disadvantaged children in developing countries. In many countries, large investments have been made to integrate ICT into education systems. For instance, as part of its 12th Five-Year Plan, China's central government earmarked funds to provide a computer room in every rural school.

Despite the popularity of ICT use in education, researchers have so far found significant variability in the impact of ICT programmes on students' academic achievement. A recent 3ie systematic review[1] on education effectiveness found that computer-assisted learning (CAL) programmes have had mixed effects on learning outcomes, and in some contexts the effects have been negative.

3ie supported a research team to examine some of the key factors that influence the effectiveness of CAL programmes in improving children's English language test scores in China. By exploring the mechanisms involved in making a CAL programme effective, this impact evaluation addressed existing knowledge gaps.

Main findings

- The researcher-implemented CAL programme was effective in improving test scores in English. However, the same programme was ineffective when implemented by the government.

- Schools in the government-implemented programme were more likely to use existing English teachers to supervise the CAL programme and replace English classes with CAL sessions. This substitution could have been one of the reasons that the programme did not have an impact.

- The computer-assisted instruction (CAI) programme was more effective than the CAL programme in improving students' English language test scores.

- Both the better-performing and worse-performing students benefited similarly from CAI.

- However, better- performing students benefited more than worse- performing students from the CAL programme.

Assessing programme impact

The research team carried out two randomised evaluations among fourth- and fifth-grade school students in Haidong, Qinghai Province. The team compared the impact of a government-implemented CAL programme with a similar programme implemented by the research team. It also examined the relative effectiveness of a CAI programme, where ICT is integrated into everyday teaching, by comparing it with a CAL programme run by a supervisor who did not teach English.

As part of the CAL programme, software was designed to improve students' basic competencies in English. An animation-based game interface was used to to make it interesting for the students. During each session, two students shared one computer and played educational games that matched the material covered that week in their regular English classes.

The CAI programme provided teachers with an English teaching plan that linked each unit in the standard curriculum to a unit in the software package. The goal of the English teaching plan was to provide English teachers with suggestions for various interactive computer-based activities they could organise during their classes. Activities included role-playing, word puzzle games and various competitions that encouraged students to engage in learning English.

Lessons for future research, policies and programmes

The researchers suggest that the lack of effective monitoring may also have made a difference to the impact of the programme. Government officials had carried out almost no follow-up checks with school officials or teachers while the programme was being implemented. The findings suggest that although CAL can play an important role in boosting English language learning, the impact of the programme depends on the quality of implementation.

The effectiveness of the CAL programme also depends on a student's level of knowledge in the subject. If a student is not performing well in English, they may not be able to benefit from a CAL programme without receiving instructions from an English teacher. This may be the reason the CAI programme, which required teachers to closely engage with students, worked equally well for all students.

Endnote

[1] Snilstveit, B, Stevenson, J, Menon, R, Phillips, D, Gallagher, E, Geleen, M, Jobse, H, Schmidt, T and Jimenez, E, 2016. *The impact of education programmes on learning and school participation in low- and middle-income countries: a systematic review summary report, 3ie Systematic Review Summary 7*. London: International Initiative for Impact Evaluation (3ie).