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Computer based mathematics assessment: Is it the panacea?

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Over the past 10 years, Mathematics *Computer Based Assessments* (CBA) have become increasingly popular across Australian primary schools. Commercial firms have identified teachers as eager consumers in this market. These firms are acutely aware of the friction points for teachers, including the challenges around creating their own formative assessments, and time-consuming marking. This has led to the development of several CBA formative assessment 'programs'. Yet, for these programs to be the panacea their advertising suggests, schools must be confident they provide valid, formative data, teachers can easily interpret and apply in their classrooms.

Currently in Australia, there are very few comprehensive formative whole number place value assessments for Years 3-6 students. To address this, a Rasch analysis-based methodology was used to develop a valid and reliable whole number place value paper-and-pen assessment, called the *Place Value Assessment Tool* (PVAT) (see Rogers, 2014). While the PVAT provided a detailed picture of student knowledge in the construct, the time taken to mark (5-7 minutes per student) was seen as a potential obstacle for teachers. To address this, the researcher investigated if a comparable online version of the test could be created.

This paper describes the trial of the Place Value Assessment Tool (PVAT) and its online equivalent, the PVAT-O. Both tests were administered, using a counterbalanced research design, to 253 Year 3-6 students across nine classes in a Melbourne primary school. Each classroom teacher was surveyed to ascertain their preferred mode of test administration, and the reason(s) for this preference. The findings show that while both forms of the PVAT are valid and comparable, the online mode was preferred by seven of the nine teachers. These teachers described how student responses could be instantaneously marked by the online data-base, and used to guide their classroom instruction the following day. As the demands on a classroom teacher's time have never been greater, this is clearly an appealing feature of the CBA mode.

Conversely, one of the teachers who preferred the paper mode described an overall distrust in the reliability of technology, worried student results would be 'lost'. The other teacher believed she was missing an opportunity to exercise her professional judgment and 'see' student misconceptions when responses were marked by the online database. This lack of transparency in the marking process, is a major constraint of CBA.

This research explores the challenges CBA presents to the fidelity of the formative assessment process. It emphasises the need for teachers to be supported through Professional Development (PD) programs aimed at developing their assessment literacy skills. This PD will empower teachers to seek quality, empirically proven assessments, and assist them to accurately interpret CBA data. Finally, despite the possibilities CBA offers, this paper highlights the importance of teachers continuing to be involved in physically marking, moderating and analysing formative assessments.

Reference

Rogers, A. (2014). *Investigating whole number place value assessment in Years 3-6: Creating an evidence-based Developmental Progression*. [Unpublished PhD thesis]. RMIT University.