Cambridge Assessment Network

The following blog is a written version of a presentation made by Simon Child, Head of Assessment Training for Cambridge Assessment Network at the Cambridge Assessment Summit of Education. It explains how knowledge of key assessment concepts can support teachers to make evidence-based decisions in order to optimise the use of technology in education.

For more on this topic, check out our assessment training webinar E-assessment: expectations, impediments and lessons learnt 07 Oct 2020 12:30 - 14:00 (UK time)

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How can professional learning in assessment improve classroom interactions with technology?

The introduction of technology in education has introduced new possibilities for transforming teaching practice. The fast-paced nature of change, however, also presents significant challenges for educational practitioners, as they have to navigate the choices available to them. This is particularly true when considering the role of technology in supporting good assessment practice, which is underpinned by complex concepts such as validity, reliability and fairness.

Technology promises positive and sustainable change in educational assessment for both formative and summative purposes. These promises include, but are not limited to, the following:

- Increased precision of assessment, by reducing the gap between assessment purposes, design and outcomes
- A wider range of assessable constructs, for example so-called *21st century skills*
- Effective use of data, for example to help transitions between educational stages
- Increased fairness, equity and social justice

There is an ever-increasing range of flexible assessment solutions and learning environments that make bold claims in terms of improving classroom interactions. However, whilst flexibility is often a good thing, it means that educational practitioners are responsible for optimising the use of technology in their assessment context. This has created an urgent need to support teaching practitioners in justifying their assessment-related decisions.

At Cambridge Assessment, we believe that professional learning in assessment should focus on developing principled knowledge and skills in relation to key concepts, with the overall aim of empowering educational practitioners to build their reflective and decision-making capacities. This knowledge supports practitioners in reflecting on how planned technological innovations in assessment can best align with different assessment purposes.

To illustrate this idea, let me take you through a worked example:

Activity – the concept of 'threats to validity'

A 'threat to validity' is something about the development, operationalisation, or process of assessment that means that the construct that you are interested in is not being measured precisely.

Construct underrepresentation
Essential aspects of the construct not being captured

Construct-irrelevant variance
Uncontrolled factors that influence assessment performance

1) Think about the potential 'threats to validity' for the two assessment approaches
2) Does the new innovation remove any 'threats to validity' or introduce new ones?

One of the key concepts in assessment is what is known as a *threat to validity*. A *threat to validity* is something about the development, process or delivery of an assessment that means that the knowledge, skills, or understanding that you are interested in is not being measured precisely. There could be many reasons for this, but we generally categorise two main types of 'threat':

1) Factors affecting student assessment performance that are not linked to their ability in the area of interest (what we call 'construct-irrelevant variance').

Factors relate to the testing environment, item bias, or marking reliability, amongst many others.

2) Factors related to the design of the assessment that mean that the knowledge, skills and understanding we are interested in are not being covered fully (what we call 'construct underrepresentation').

An (extreme) example of construct underrepresentation would be if we were interested in students' abilities in converting fractions to decimals, but only asked questions related to multiplications and division.

With a firm understanding of the concepts of 'construct-irrelevant variance' and 'construct underrepresentation' it is possible to look at technological innovations in assessment with a critical eye.

To take a straightforward example - think about a teacher that is thinking of changing a classroom topic test from a paper-based assessment to an on-screen equivalent. How does this remove (or perhaps introduce) *threats to validity*?

The movement to on-screen testing will potentially increase the precision of the assessment, reducing construct-irrelevant variance. Data from previous versions of the test could be used, for example, to check the quality of the items and content coverage. The movement to

on-screen may also increase the potential to use the data from the test to track progression of students over time.

However, there may be new factors introduced that influence student performance on the test, such as typing speed, familiarity with using computers, on-screen reading accessibility and so on. These could be new ‘threats to validity’ that should be carefully considered before technological innovations are implemented on a larger scale.

Giving practitioners the tools to understand, critique, and justify their assessment-related decision-making is a key element in supporting the development of effective classroom practice. Practitioners should be empowered to use their acquired knowledge of key assessment concepts to develop new insights in their working contexts. This will support them to make evidence-based decisions, in order to optimise the use of technology in education.