Education Endowment Foundation

SUMMA Innovación en Educación

Synthesis

Digital technology[i]

Moderate impact for moderate cost, based on extensive evidence

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By digital technology we mean the use of computer and technology assisted strategies to support learning within schools. Approaches in this area vary widely, but generally involve:

1. technology for students, where learners use programmes or applications designed for problem solving or open-ended learning; or
2. technology for teachers, such as interactive whiteboards or learning platforms.

How effective is it?

Studies consistently find that digital technology is associated with moderate learning gains: on average, an additional four months' progress. However, there is considerable variation in impact.

Evidence suggests that technology approaches should be used to supplement other teaching, rather than replace more traditional approaches. It is unlikely that particular technologies bring about changes in learning directly, but some have the potential to enable changes in teaching and learning interactions. For example, they can support teachers to provide more effective feedback or use more helpful representations, or they can motivate students to practise more.

Studies suggest that approaches which individualise learning with technology (such as one to one laptop provision where pupils work through learning activities at their own pace, or individual use of drill and practice software) may not be as helpful as small group learning with technology or the collaborative use of technology.

There is clear evidence that digital technology approaches are more beneficial for writing and mathematics practice than spelling and problem solving, and there is some evidence that they are more effective with young learners.

Latin American Evidence[ii]

Most studies on digital technologies in Latin America use both mixed and exclusively qualitative methodologies, mainly those with a focus on action research. In general, digital technologies are recognized as an innovative tool that contributes positively, not only to students' learning, but also makes the teaching-learning process more attractive. It is argued that its implementation must be accompanied by relevant pedagogical training in order to generate positive results. Some case studies highlight the difficulty faced by teachers in developing ICT experiences in the school context, because of preconceptions, undeveloped ways of evaluating ICT learning and inability to definewhat achievement means with digital technologies.

These studies claim that the proper use of ICT can improve the teaching-learning process, but it should be implemented correctly. This means that the use of digital technologies must be accompanied by training with these tools and, equally importantly, they require the commitment of teachers in the use of ICT to enrich their pedagogical practices. In addition, there are some limitations regarding the application of these strategies, for example, costs that are associated with the use of digital technologies; each student having access to a computer or tablet means a cost for students' schools or families.

Although nowadays ICT seems to play a fundamental role in and out of school, there is a need to develop more empirical studies in Latin America and the Caribbean to know the effect that digital technologies have on academic success.

How secure is the evidence?

There is extensive evidence of positive effects across age groups and for most areas of the curriculum. However, the variation in impact and the range of technologies available suggest that it is always important to monitor the impact on learning of any new approach.

The pace of technological change means that the evidence is usually about yesterday’s technology rather than today’s, but average effects have remained consistent for some time, suggesting that the general message of – on average – moderate positive impact is likely to remain relevant.

What are the costs?

The total costs of using digital technologies – including all hardware – can be high, but most schools are already equipped with hardware such as computers and interactive whiteboards.

Digital technology approaches often require additional training and support for teachers which can be essential in ensuring the technology is properly used and learning gains are made.

Costs are therefore estimated as moderate.

What should I consider?

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

1. Effective use of digital technology is driven by learning and teaching goals rather than a specific technology: the technology is not an end in itself. You should be clear about how any new technology will improve teaching and learning interactions.
2. New technology does not automatically lead to increased attainment.
3. How will any new technology support pupils to work harder, for longer, or more efficiently, to improve their learning?
4. Pupils' motivation to use technology does not always translate into more effective learning, particularly if the use of the technology and the desired learning outcomes are not closely aligned.
5. Teachers need support and time to learn to use new technology effectively. This involves more than just learning how to use the hardware or software; training should also support teachers to understand how it can be used for learning.

SUMMA (2019) Latin American Evidence, Digital technology.