

HOW ICT CAN BE MEANINGFULLY INTEGRATED INTO THE CLASSROOM

Transitioning to technology-based education from centuries of “traditional” teaching methods in a relatively short timeframe has been one of the great challenges of modern education systems. Despite the introduction over the past decade or so of technology initiatives (such as Interactive White Boards, or IWBs, and one-to-one laptop and tablet programmes) there has not been a corresponding significant improvement in student learning (Howard & Mozejiko, 2015). A sophisticated use of ICT must be explicitly integrated into student education, since research shows that the technologies used are less important to promote learning than changes in the actual processes’ educators use to teach digital technology (Howard & Mozejiko, 2015).

This puts the responsibility directly back on teachers, who must be willing to experiment with various learning tasks and digital technologies to support student learning (Howard & Mozejiko, 2015). To ensure a meaningful and prosperous integration of ICT within the classroom, it is important that teachers are aware of the implications that ICT has on their practice. Teachers are still key to engaging students in meaningful and relevant learning experiences (Jacka, 2022) and it is important that teachers know how and when to incorporate technological tools. A solid understanding of the learning content and pedagogical strategies are a crucial component to effective incorporation of ICT in the learning environment.

Puentedura’s (2006) Substitution, Augmentation, Modification, and Redefinition (SAMR) model acts as a useful tool for incorporating a new ICT into the classroom. The SAMR model provides teachers with a framework for thinking about meaningful technology implementation in the classroom. Digital technologies are ever-changing and not always predictable; it is often unclear how yet-to-be-developed hardware and software will be used (Hamilton et al., 2016). Teachers do not always understand the inner workings of software and technological devices they use, and when these factors are combined with teachers’ individual pedagogical choices, beliefs and motivations, it can make integrating technology into the classroom a difficult process (Hamilton et al., 2016).

The SAMR model is a four-tiered approach to the selection, use, and evaluation of technology in K-12 education (Hamilton et al., 2016). The substitution level is when traditional teaching methods are replaced with digital methods, such as presenting examination questions digitally rather than in hard copy. There is, however, no functional change beyond this (Puentedura, 2006). Augmentation means that the replacement digital technology positively changes the function of the task or tool in some way (Hamilton et al., 2016). An example in a music classroom might be a musical interpretation for one instrument presented by the teacher augmented through students accessing digital recordings of its integration into an entire orchestral performance. The modification level is when digital technology demands a significant task re-design, such as the ability of interactive computer simulations to completely transform the theoretical teaching of physics (Hamilton et al., 2016). Finally, when

completely novel tasks are made possible through digital technology, the redefinition level has been reached. An example of this might be assigning to students the task of presenting their ideas in a novel way via a digital format such as video or PowerPoint rather than asking them to write an essay.

The SAMR model, however, has few connections to theory and prior research and limited evidence to support the differentiation of the different levels, which can lead to misunderstandings and confusion for teachers (Hamilton et al., 2016). It also cannot be assumed that all types of digital technology will have a positive effect on learning. When Mueller and Oppenheimer (2014) made a comparative study of students taking longhand vs digital notes (said by Puentedura, 2006, to be a good example of the substitution level) they found that this type of substitution had a negative impact on student learning. This further highlights the importance that good pedagogy and teaching practices have over the incorporation of ICT.

A sociocultural perspective posits that education and cognitive development are cultural processes (Mercer et al., 2019). Human intelligence is intrinsically social and communicative, which has implications for educational success lying in the nature and quality of social and communicative processes of education rather than individual capabilities, teaching skills, or resource qualities (Mercer et al., 2019). The quality of spoken interactions between teacher and students and among students can therefore be highly significant educationally (Mercer et al., 2019).

Technology can play a key role in supporting joint reasoning through exploring and evaluating different ideas (Mercer et al., 2019). One example of the way this can happen is using computer-based, collaborative activities where students can develop skills in thinking, expressing and sharing ideas together (Mercer et al., 2019). Interactive White Boards are also very useful to encourage discussion and interactions that are far more collaborative than by using more traditional white or black boards.

It is clearly very important to take a considered approach to how an educator integrates ICT into the classroom. My personal stance is that I would attempt to use a meaningful, measured, and thoughtful integration of digital technology into my lessons, with plenty of room for feedback and correction if necessary. Technology also allows data and work to be saved, revisited, modified or re-purposed at a later stage if necessary (Mercer et al., 2019). However, of most importance to me is the idea that ICT can be used to enhance good teaching practice without replacing it.

References

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