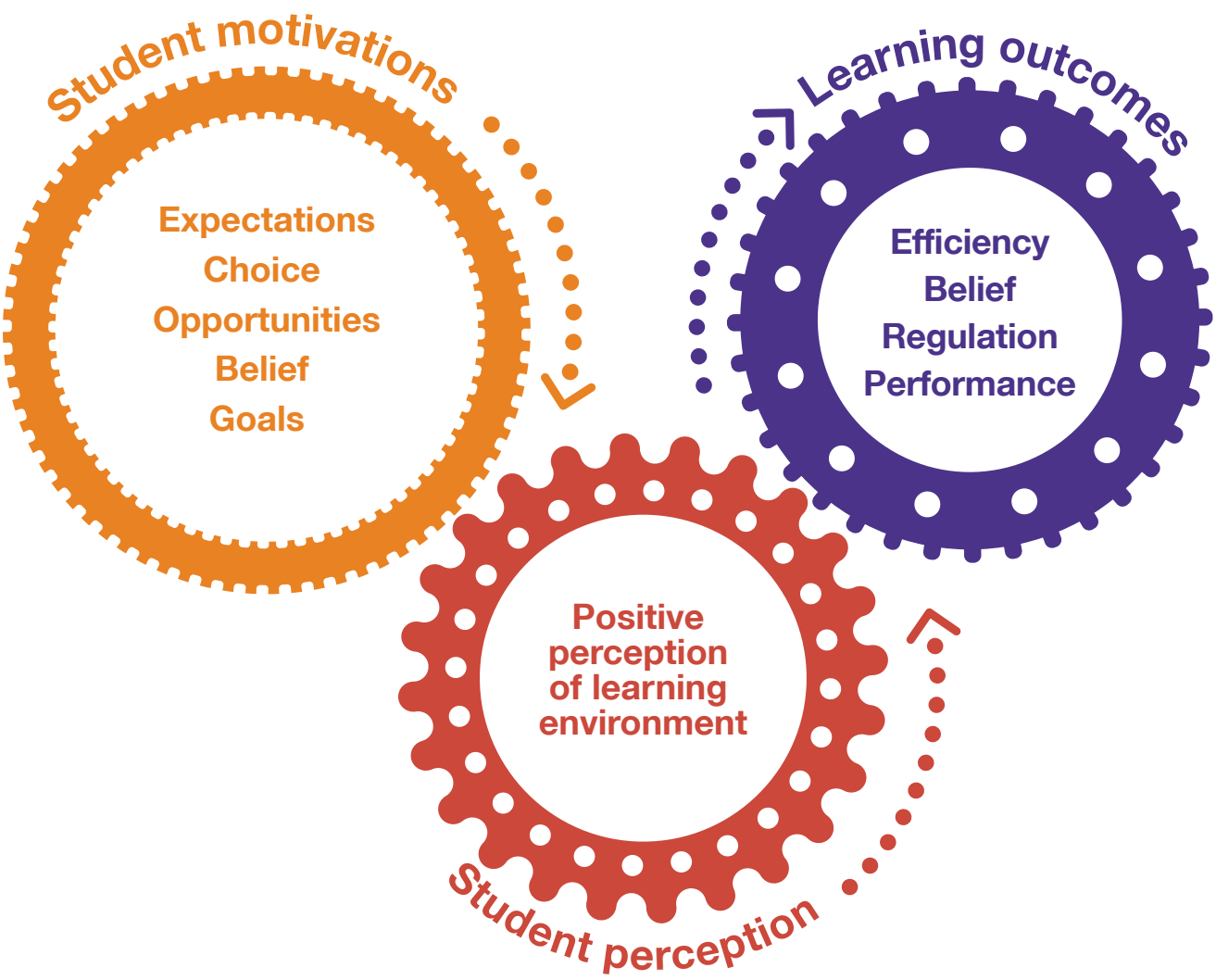
Byte-sized edtech research

How can educational technology motivate learners?

Figure 1 Based on Pintrich's Motivation Generalisations (2013)



- Motivational elements within educational technology (edtech) can be effective for learning, if designed carefully.
- Motivation is achieved in a variety of ways and can enhance learning.
- Game-based learning can provide highly motivating environments.
- 'Cognitive conflict' – deliberately providing contradictory information – can be a useful teaching strategy, promoting enquiry and deliberation.

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"Motivation is an internal state or condition that directs human behaviour towards a goal. It is widely believed that positive motivational states – often observed as enjoyment, affective engagement and situational interest – can have a positive effect on learning outcomes."

Canan Blake, 2019 (see also Ryan and Deci, 2009)

"Motivation interventions have demonstrated promising results for enhancing educational outcomes."

Lazowski and Hulleman, 2016

01 What motivates learners?

'Motivation' is an internal state or condition that directs human behaviour towards a goal.

Motivation can enhance learning – especially when it is nurtured within open, innovative, informal and independent learning environments. In 2003, Pintrich's research resulted in a list of the principles that motivate students in the classroom, which included aspects such as control over their learning, clear goals, and a belief in the value of their studies.

Conclusions: An understanding of motivation and the principles behind it can guide the design of effective edtech tools.

02 Can edtech boost motivation?

The role of motivation in learning is becoming ever more important.

This is happening, at least in part, because of a broad societal move towards open, innovative, informal and independent experiences both within and outside of the learning environment.

The numerous opportunities for learners to use edtech independently – via their personal devices, for example – highlights the need for careful design of motivational elements.

Conclusions: Designers of innovative educational tools may consider incorporating motivational triggers in their products.

03 Game-based learning

When people play games, especially on mobile phones, they can enter a state of absorption or "flow" (Csíkszentmihályi, 1990). This happens because technology can immerse users into a mixed-reality environment.

This intense focus can be seen as the highest state of motivation. Malone and Lepper (1987) link the intrinsic motivation seen in game-play with successful learning. They propose seven factors that promote intrinsic motivation: challenge, curiosity, control, fantasy, competition, cooperation and recognition. As technology has the potential to immerse users into a mixed reality environment, it can also provide highly motivating learning environments (Schwabe and Goth, 2005).

Conclusions: Game-based environments have substantial promise but there are still challenges, such as setting and assessing learning objectives to ensure desirable outcomes (De Freitas, 2006).

04 Conflict and confusion

Alongside motivation, 'cognitive conflict' impacts on learning. This is when providing "anomalous data or contradictory information" is used as a teaching strategy (Limon, 2001).

This "anomalous data or contradictory information" should be pitched close to but just beyond students' prior knowledge and understanding to ensure it does not result in 'cognitive overload'. D'Mello and colleagues (2014) asked whether confusion itself promotes "deep inquiry and effortful deliberation."

Conclusions: Technology may be able to improve learning using cognitive conflict as it can provide tailored information and instruction for individual learners.

EDUCATE is the UK's leading edtech research accelerator programme. Our mentoring and consultancy services combine world-class pedagogical research with best practice business intelligence to uncover innovative solutions in teaching and learning. Our vision is to create an edtech ecosystem which has evidence at its heart – understanding what truly works for learners and how to use technology to serve its users effectively.

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Read an in-depth summary of evidence by Canan Blake on this topic at: www.educateventures.com

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