

App generation

Through extensive research, Gardener and Davis found that technology has key benefits to the development of student's cognitive mastery. The success of improved development relies heavily on the way the technology is used. The term 'digital natives' is often used to describe the way students can easily master the use of technology, but it does not reflect the students ability to learn with technology.

The key benefits highlighted were that digital devices were personal, inviting and appeal to a variety of senses. Personal in the sense that the individual user is increasingly in control of what is received and when it is received. This promotes independence in learning and requires decision making to determine importance. The devices invite activity in the sense that it is easy and straightforward to transmit content as well as to receive it. This allows for shared learning and provides a variety of ways to receive feedback. Digital devices can readily and actively involve the visual and tactile senses, as well as the auditory, hence catering for a variety of learning styles.

When using Apps successfully in education they need to promote:

- *identity formation*: students are deliberate and thoughtful about their own image and how they want others to perceive them, audience aware
- *intimacy*: make wider, deeper connections in their own learning as well as to the broader community , students are able to explore ways to relate to others
- *imagination*: open up new ways of creating and producing, develop new skills.

The Torrance Test of Creative Thinking (TTCT) was used in an American study over the last twenty years to examine creative thinking in young people. The study showed a decline in elaboration, which includes the ability to elaborate on ideas and engage in detailed and reflective thinking, as well as the motivation to be creative. So why, when young people are exposed to a variety of communication and creation tools, is there a decline in elaboration and creativity? Discussion with a number of camp directors found that children's creativity was hindered by the search for 'correct answers' and 'documented procedures'. This, and precise scoring rubrics, also echoed the observations that Howard noted among his students in recent years.

MIT Media Lab research found digital tools achieve greater outcomes when support and collaboration are present. Digital devices make possible a degree of individuation that would have been virtually inconceivable in earlier years. New media offers two fresh opportunities. One is the chance to initiate and fashion one's own products. The second opportunity entails the capacity to make use of diverse forms of understanding, knowing, expressing, and critiquing in terms that Howard has made familiar, our multiple forms of intelligence.

The study showed student's cognitive development, learning, is most productive when they build their own forms of meaning and construct knowledge that they personally value. This reflects the claim of cognitivists that one learns by taking the initiative, making one's own often

instructive mistakes along the way, and then, on the basis of feedback from self and others, altering course and moving ahead. This is also supported by Hattie's learning effects.

Apps should be enabling. They should be open enough to offer multiple forms of expression, and the responses from adults and other users should not be constrained. Apps should offer a new avenue for individuals to explore different pathways, to record their own forms of understanding, and to solicit reactions from others.

It is a teachers responsibility to provide nudges in the direction of flexible use of apps, to offer initial scaffolds in the form or use of apps but then to remove these as soon as feasible. They should guide the implementation of spaces and monitor the times in which students should put the device aside and fend for oneself.

As Whitehead saw it, 'genuine learning begins when one is excited, moved, inspired, or stimulated by an early encounter with a question, phenomenon, or mystery—this is the time of romance. But one remains stuck at this point, or becomes bored or alienated or anxious, unless one can begin to acquire tools that allow one to gain a firmer understanding of the initially seductive phenomenon' (1967). Gardner and Davis believe that apps can and should facilitate the initial romance; present multiple ways of attaining precision; and, in the end, provide ample opportunities to make novel as well as expected use of what has been learned.

Apps, or the device, should provide students with a chance to create their own answers, to raise their own questions, and to approach them in ways that are their own.

Gardner, H, Davis, K., (2013) **The App Generation – How today's youth navigate Identity, Intimacy and Imagination in a Digital World.** Yale University Press, London.