Adjusting to Different Learning Techniques in the Digital Age

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Abstract
Over the last decade, there has been a growing trend in the application of digital media as an educational resource. Whilst such a shift towards non-textbook based sources creates many opportunities, the impact of digital media on deep learning and reflection remains relatively unexplored creating both unexpected advantages and pitfalls. The abundance of relatively limitless amounts of information and data may require educators to evaluate and guide students towards relevant sources. In this essay, I discuss recent findings on the impact of digital media on deep learning and its potential in third level education.

Introduction
Gone are the days when the Encyclopedia was the go-to source, now vast sums of human knowledge and experience are available on demand via electronic devices that would have been dismissed as mere science fiction just twenty years ago. However, such a rapid shift to digital media raises several important issues in how we process information and the ability of our brains to reflect and conceptualize what we have read. There is a danger in making a “Faustian” pact whereby we sacrifice key aspects of learning and knowledge for speed and accessibility. In his article Nicholas Carr (Carr, N, 2008) mused in “Is Google making us stupid?” While the article did generate a great deal of controversy, a key concept was our changing approach to information, both sourcing and processing. This rapid change, while seemingly beneficial, can affect our ability for reflection and deep learning.

The Digital media age and education provision
There are many pros and cons in using digital media as a source for learning. Observing the obvious global trend in internet reading; many traditional textbook providers have already began the transition to various digital media platforms. In addition to the obvious advantage of availability, online resources often allow for a more extensive and tailored user experience. The inclusion of hyperlinks in the body text allows students to rapidly access references or
explore topics that are more complex by linking back to previous material. Many e-book providers include both teacher and student interfaces that contain downloadable material or chapter related quizzes to allow the student to reflect and self-assess their progress. The question of digital media is also a socio-economic one, E-books tend to be cheaper and allow for more variation in book sources. It is also much easier for students to avoid the “edition” hurdle, where the constant updating of textbooks results in planned obsolescence and deviations from the recommended course material. The most obvious example and success story is the appearance of MOOCS, or online digital courses that are typically free to access; do not require huge amounts of resources and allow study at the students pace. For example, one of the most prestigious research institutions, MIT, now offers a variety of online digital courses with no user cost. Wikipedia again is also an example of the success of digital media, whereby information and linked is provided to all users free of charge. Such developments should not be understated, and are perhaps one of the greatest achievement in providing global education for all regardless of economic background.

**Digital media and impact on deep learning**

In spite of the benefits, several concerns have been raised about the efficacy and long-term impact of digital media as a tool for deep learning, memory and comprehension (Leu & Zawilinski, 2007). By its very nature and abundance, digital media tends to encourage skim reading compared to traditional print sources. It is much easier to scroll through text while only superficially reading the contents when compared with print media. Even features that at first glance would appear positive have been shown to have a negative impact on learning. For example the ‘‘hyperlinkification’’ observed in online material can serve as a distraction and not a tool for deeper learning (McPherson et al, 2005). Such material has an inherent danger of drawing the unsuspecting user down an information black hole where the initial aim and focus of study is forgotten resulting in superficial learning and information fatigue. Building upon this is the perhaps more obvious intrusion of advertisements and pop-ups into the digital domain. While seemingly benign, the presence of such advertisements (in addition to ethical concerns) is much more difficult to ignore than in print media and can negatively impact learning by distraction and breaking of train of thought (Moje & Pugh, 2009). Online reading has the temptation of internet access where one can browse unrelated sites and content either as a reward or as an actual distraction after only a short time studying.
What the research shows

Thus far, there has been relatively low number of studies on the impact of digital vs traditional sources of information. In addition, many of those studies have been performed on preschool students whose relative plasticity and adaptability to learning may not be comparable to third level education, however even in those studies an overreliance of sounds, animation and activities was shown to reduce attention and learning (Reich et al, 2016).

In a study by Schugar (Schugar et al, 2013), it was found that students using on-screen reading relied less on traditional learning strategies such as note taking and summarization compared with those using printed media. Such findings may be indicative of issues in long-term learning. Indeed the type and quality of answering to exam type questions was found to be fundamentally different depending on the study source. Studies by Kaufman and Flanagan (Kaufman & Flanagan, 2016) found that those who studied digital text did well in scoring when asked specific questions whereas those using print media did better at answering abstract questions more reflective of deep learning. In a study, involving students in Norway Mangen (Mangen, Walgermo & Bronnick, 2013) reported a significant difference in test scores, with those reading the printed version generally reviving higher grades than those using a digital scan of the same text. Thus, the nature of the words as well as their meaning can have implications for what we understand. An interesting suggestion from this study was that paper provides spatio-temporal markers to the reader. Touching paper and turning pages aids the memory, making it easier to remember where you have read something. Thus, the learning process contains a tactile and visual element that is hard to reproduce using a digital platform. In their report Hooper and Herath (Hooper, V & Herath, C. 2014), note that online reading had a negative impact on cognition, concentration and recall rates; however an interesting take home message was that we tend to recall better when reading something in our down time and when not work related.

Merging Digital media and Constructive Alignment, an integrated approach

The concept of constructive alignment was initially coined by John Biggs as a proactive approach to course design whereby the intended learning outcomes and teaching methods are aligned with the process of student assessment (Biggs, 2003). At the most basic level the process consists of two interdependent components, the constructive phase, referring to how students approach learning and the alignment phase, referring to what the teacher does in
order to ensure student assessment is accurately reflected by the stated intended learning outcomes and teaching methods employed. Several years of research and supporting analysis have gradually resulted in a paradigm shift with constructive alignment emerging as one of the current dominating concepts in educational theory with empirically verifiable results (Boyle, 2007; Hoddinott, 2000). One major advantage if this approach is that incorporation is entirely context dependent and can take varies guises depending on the subject area. However, a unifying ideal is that constructive alignment should facilitate the acquisition of deep knowledge and understanding while avoiding rote surface learning found in courses implementing traditional didactic methods (Biggs & Tang, 2011). Taking into consideration there would appear scope for educators to approach digital media under the guises of constructive alignment, both in the design and implementation of various courses. One key factor into the success or failure of such an approach would be the selection of what digital means should be used by the student during the learning process. There is a danger here for the educator to view all sources as equal and allow the student to carte blanche choose what digital sources to use. To paraphrase, not all sources and created equal. Overcoming these pitfalls will require the engagement of the educator in selecting what online sources or e-books are to be used based upon the intended learning outcomes. Such sources should be clearly stipulated as “optimal” reading along with what online resources are available. With the advent of more resource material associated with course books, it should be possible to add self-examination questions that complement each lecture. The online platforms of many of the main publishing houses already contain book related quizzes and flash cards, resources that can and should be used by educators to taper and align online content to learning outcomes. In addition the educator should be aware that today’s digital students are constantly bombarded with information and thus may require help in deciphering what is necessary and even how to approach studying in third level. In this regards, training in information searching and retrieval, library facilities and study techniques should be provided early on in education.

Reflections

As stated by Boud, ‘Reflection is an important human activity in which people recapture their experience, think about it, mull over & evaluate it. It is this working with experience that is important in learning’. There is no reason why digital media cannot assist in reflection and deep learning; however, it should be approached with clear aim or purpose. Simply allowing students to access digital media or books without guidance of the educator is simply not going
to suffice and will only hamper deeper learning. Indeed, digital media should be embraced by the educator as a complementary method of learning. Several examples already exist at IMH where digital media is used to complement existing course structures. The use of LISAM as a cross-platform communication tool is widely used for the majority of courses. However, features such as quizzes and collaboration spaces tend to be overlooked as a learning tool and could in fact be better utilized. A feature of the platform is the possibility to add links and web pages. This creates a possibility for the teacher to create their own personalized "digital classroom" where the contents of the courses can be supported by relevant educational link. The addition of quizzes could also be provided to allow the student to assess their own progression during the term. A key point however is to use the platform as a support and not a replacement for a recommended course text book. Training and optional courses in LISAM for new instructors would be beneficial. Free to use platforms such as Socrative also allow for a more interactive gauge of students’ knowledge. In my own classes, I have used Socrative to build anonymous POP quizzes that can be used to determine if a topic is understood or whether more focus is required. Thus using digital media tools as a complementary tool but not a replacement for traditional text based sources should be beneficial in improving learning.
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