# DEVELOPING ONLINE LEARNING WITH THE 'RIPPLE EFFECT'

## Rebecca Ferriday

*Cardiff University (UNITED KINGDOM)*

## Abstract

Online learning can often be a passive and somewhat 'linear' experience, with students working through content at a pace and level pre-determined by the curriculum to which they are aligned and with little or no opportunity to differentiate.

The 'ripple effect' highlighted in this study adheres to the following format: a specific theme or concept is introduced to students. This theme can be likened to a pebble being dropped into water. Ripples emanate from this pebble (or theme) in concentric rings, with each ring examining the central concept at a deeper level of cognition than the level before it.

Cardiff University's School of Healthcare Sciences (HCARE) has developed a number of online, self-study resources for physiotherapy students based upon this ripple effect. Students are introduced to a concept, and are then invited to choose their own pathway through the resource in order to learn more about this central conceit, only stopping when they feel that their desired level of understanding has been reached.

Key information that students *must* be aware of in order to complete their course of study is presented within the first two or three 'rings' of learning – any subsequent, deeper rings contain supplementary information and activities that students are not required by the curricula to know, but may choose to access in order to gain a deeper level of understanding beyond the knowledge that is required. This allows study to become self-directed and for students to take 'ownership' of their own learning.

Keywords: self-directed learning, ripple effect, differentiation, online learning.

## 1 INTRODUCTION

Ever since the early days of technology-enhanced education, eLearning products and technologies have been sold by using the term 'interactivity'. On examination of a variety of eLearning solutions, it seems clear that this term means different things to different people. However, for the purposes of this paper, the Oxford Dictionary (2015) definition of 'interactivity' will be used [1]:

> 'Allowing a two-way flow of information between a computer and a computer-user; responding to a user's input'

Historically, much online learning cannot really be categorised as 'interactive' inasmuch as it provides students with little more than a passive, one-way experience. Even in this era of Web 2.0, virtual worlds and Augmented Reality (AR), text-heavy PowerPoint presentations, lengthy word-processed documents and – in the spirit of including multi media – interminably long films or audio files are uploaded to Learning Management Systems (LMS) with alarming regularity the world over. The provision of online learning materials has become no more than a 'box ticking exercise for many practitioners who have traditionally practiced their art in the classroom or lecture theatre. Many find it hard to transfer their classroom skills to online provision, so perhaps cannot be blamed for assuming that an online repository of presentations and texts will be sufficient.

In direct opposition to this provision of passive online learning is compelling evidence to suggest the importance of encouraging student control over the learning process, both in shared 'traditional' learning spaces and those online [2] (McLoughlin and Lee, 2010). There is little or no student control (or, indeed, interaction) when presented with online materials consisting of screen after screen of text. In order for self-regulated learning to come to fruition, learners need not only to be able to choose and personalise what tools and content are available, but to have access to the necessary scaffolding to support their learning. The ripple effect introduced in this paper provides such a form of scaffolding and the two-way interaction makes learning an active and truly interactive experience.

The UK based Committee of Enquiry into the Changing Learner Experience (CLEX, 2009) concludes that [3]:

"Web 2.0, the social web, has had a profound effect on behaviours, particularly those of young people whose medium and metier it is. They inhabit it with ease and it has led them to a strong sense of communities of interest linked in their own web spaces, and to a disposition to share and participate."

While this indicates that digital-age students want an active learning experience (and, ideally, one that is social, participatory and supported by rich media), current research also points to a growing appreciation of the need to support and encourage learner control over the whole / entire learning process [4] (Dron, 2007). This can be hard to do for a variety of reasons – teaching staff feel threatened by eLearning, often seeing it as a digital 'replacement' for teachers. They perceive online learning as a concept – or even a language – that is somehow separate to them and their understanding of teaching and learning. They have concerns about what they often see as a relinquishment of control, or are concerned that students, bereft of on-going teacher support, will move off-topic – or not engage at all. However, contrary to this, because they use technologies in all aspects of their studies, today's learners rarely see eLearning as a separate or special activity. Moreover, they are adept at blending personal and institutionally owned technologies with traditional approaches to learning in ways that are unique to them [5] (Conole and Creanor, 2007).

Logic would dictate then, that in order to tick two important educational boxes – those of self-directed learning and the development of active, participatory and truly two-way online materials - a framework needs to be developed that allows students to personalise their learning-to 'self-differentiate'- effectively.

## 2    DEVELOPMENT OF A RESOURCE USING THE RIPPLE EFFECT

The first resource developed with this framework examined the subject of injury aetiology, with five common causes of injury: *surfaces, climate, footwear, protection* and *equipment* introduced as the initial 'stones' from which ripples would emanate. The software used to develop the resource was *Adobe Captivate*, supplementary films were taken from *YouTube* and embedded activities were developed using the free-to-use Internet-based application *Padlet* (formerly *Wallwisher*).

Overarching information was imparted via bite-sized chunks of text (nominally, one or two short paragraphs) illustrated and consolidated via complementary images and short films. This would effectively form the first and second 'ripple'. An activity would then go on to form the third ripple. Ripples were signposted on screen via clearly labelled buttons directing the student around the resource (see figure 1). 'Back' buttons were also added throughout, so students were able to move backwards and forwards around the resource. In doing this, learners developed individual pathways through the resource. This meant that the standard linear and 'on rails' method of interaction and navigation was done away with.



Figure 1: Screen shot of Injury Aetiology resource

A diagram showing the navigation of one of the topics introduced in the injury aetiology resource and its subsequent ripples can be seen below (see figure 2). The diagram shows ripples emanating from one of the resource's central conceits; *surfaces*. Here, the red ripples closest to the theme highlight mandatory content as they cover key information relevant to summative assessment. Ripples highlighted in green refer to optional content.
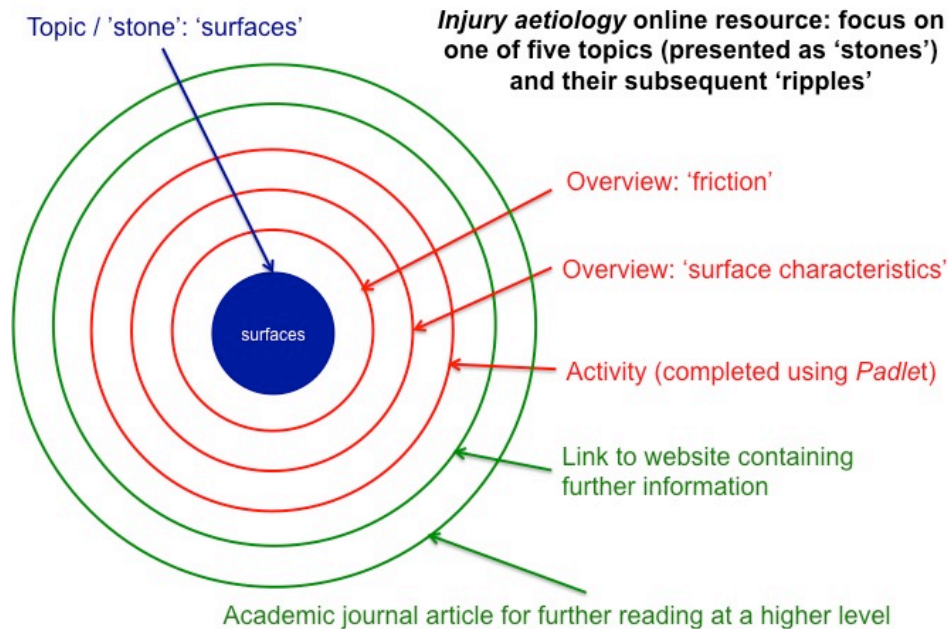


Figure 2: Overview of ripples emanating from a core theme

In order to provide an opportunity for interaction by way of reflection and the sharing of ideas and content, an activity based around a shared digital noticeboard was created using *Padlet* (see figure 3).
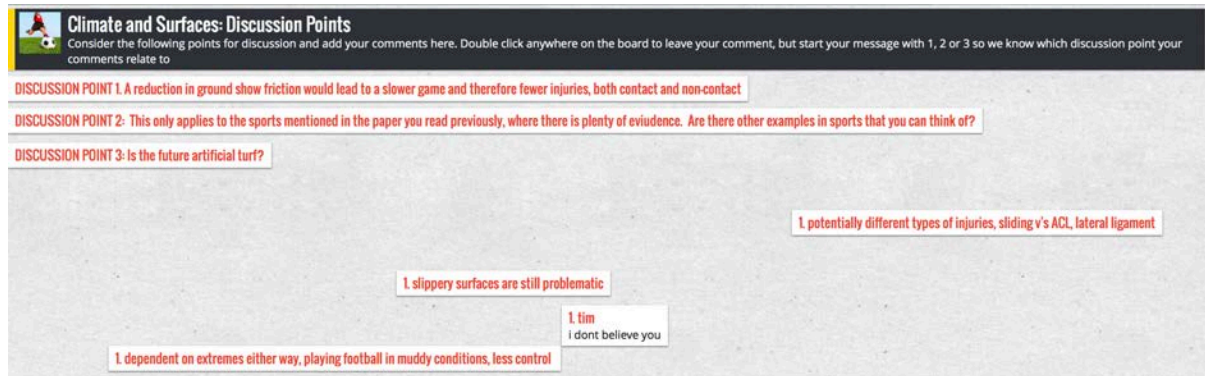


Figure 3: Screenshot of online discussion board using 'Padlet'

Students were invited to take part in an on-going, asynchronous discussion. Opportunities for sharing curated resources and for on-going peer learning were developed without any teacher input: students started to use this digital noticeboard to share links, films, articles, and anecdotal experiences organically and in doing so developed a small but flourishing community of practice. At this point it would be useful to identify that the term "community of practice" is of relatively recent coinage, even though the phenomenon it refers to is age-old. The concept has turned out to provide a useful perspective on knowing and learning, with a growing number of people and organizations in various sectors now focusing on communities of practice as a key to improving their performance [6] (Wenger, 2011).

Further ripples were developed in order to present students with an opportunity to link to relevant web sites, readings and academic papers. Students were told that working through these particular ripples was not a mandatory requirement of completing the resource, nor of their overarching course of study, and that, though still relevant to the topic, the content of these 'outer ripples' would examine the central tenet in more depth, at a higher and more critically reflective level, and, as a result, would be more text-heavy and therefore akin to the more passive elements of eLearning highlighted at the start of this paper.

## 3 STUDENT FEEDBACK

The injury aetiology resource was published to a local server. This generated a Uniform Resource Locator (URL, also commonly referred to as a *web link* or *hyperlink*), which was given to students along with instruction relating to how to work through the resource and an indication of which ripples were mandatory and which were optional.

One week after the URL had been given to students, a second noticeboard was set up (again using *Padlet*) and students were invited to leave anonymous feedback after working through the resource. They were asked to share comments relating specifically to their experiences of working through the resource, whether they felt they had learned anything relevant to their course of study, and the level at which they had stopped using the resource. The noticeboard was made available to students for two weeks and then taken offline.

Of the 38 students who undertook the *Injury Aetiology* activity, only 12 (a little over 30%) left feedback. A selection of comments follows:

> 'I knew we could do as much as we wanted, and that I had to go as far as the noticeboard task. There were a few comments on there about the articles, which I wasn't going to read but I felt that I had to. Not so sure whether thats *(sic)* a good or a bad thing!'

> 'I liked the sporting bloopers film in the surface caracteristics *(sic)* section. really *(sic)* funny. But it did make me think more about how protection and footwear can make a big difference to your chances of getting an injury on different surfaces.'

> 'Nice to be able to go into things in more depth if you have time or you want to. Soime *(sic)* areas I knew more about than others, so I went into the bits I wasn;t *(sic)* so sure about in more detail.'

> 'Not so much to read here. That was good bt *(sic)* I didn't know if I had covered enough. The academic readings were a bit too much after the first bits, with less to read. Maybe some questions to test your knowledge? (I don't want to suggest more to do really though!)'

> 'The discussion board was good – better than a forum on Learning Central *(Cardiff University's Learning Management System)*. I learned a lot from the links other people had put on there.'

## 4 CONCLUSION AND AREAS FOR FUTURE DEVELOPMENT

The low-key research carried out so far is only a starting point, and it is clear at this stage that much more rigorous research is required to ascertain: 1. Whether the ripple effect improves levels of student satisfaction with online learning and 2. If there are links between access to optional areas of this resource and summative assessment results.

To this end, it is intended that six more student groups will be given an opportunity to work through the online *Injury Aetiology* resource in the course of the next twelve months. They will be invited to leave feedback after completing the resource, though it is proposed that, in order to produce richer and more detailed data, they will be asked specific questions by way of an online survey.

Academic staff working in HCARE have attended a live demonstration of the *Injury Aetiology* resource in order to understand more about the structure of the resource and how the same framework can be used to develop further online activities. Responses to this demonstration have been positive, and at the time of writing, six members of staff are currently looking at content for their own subject areas with a view to developing online resources using the ripple effect for their students.

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