

In with the in crowds

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Abstract—Internet technologies and the means and scale of sharing and communication that they afford have resulted in greatly altered social forms that have value in learning, but that also present new and sometimes harmful consequences and require new forms of social literacy in order to exploit them effectively in learning. This paper explores the nature of those social forms and their relationships with learning, identifying both benefits and risks in their adoption. It provides a set of research problems that must be solved in order to make better use of these emerging forms.

Index Terms—social media, groups, networks, sets, colectives, collective intelligence, education, learning

INTRODUCTION

HERE used to be only one way to learn from others in a learning community: to be co-present with them, but even then learning diffused at a distance. Story-telling, apprenticeship and other formal and informal processes of learning allowed knowledge to grow and spread through time and, slowly, through space, as communities splintered and swelled. Agorum, gymnasia, schools, colleges, universities and other gathering places and technologies adapted for learning, allowed people to come with a specific formalised purpose of knowledge acquisition, to gain knowledge, and then to go and spread that knowledge further. In parallel, as our information and communication technologies developed, writing, drawing, sculpture, theatre, music and other replicable arts of communication allowed us to expand our reach beyond the immediate here and now but, in the process, separated us from their originators. The crowd became spectators and the spread of knowledge through ICTs became an increasingly one-to-many activity. This process was amplified as high-cost, high-distribution media (books, newspapers, radio, cinema, TV) became available through dedicated publishers, that effectively put the means of distribution beyond the reach of all but a few. Those few were, of economic necessity, vetted by publishers and media companies who acted as filters, channelling and editing the production of knowledge for easier and usually profitable consumption. Meanwhile, schools, universities, training departments and other organisations made use of these media and other technologies available to make the acquisition of knowledge more effective. They gathered resources, technologies, learners and the learned together in one place in order to learn more efficiently. The combination of contingencies resulting from the necessities of physics, economics and technological constraint resulted in a highly evolved system of pedagogies, tools, spaces, media and methods that could make effective use of available resources for learning. Through generations of refinement and use, we have become very literate in using individual and the social form of small groups and publication for learning.

AND THEN THE INTERNET HAPPENED.

Early attempts to use the emerging Web replicated the traditional one-to-many and group-oriented modes of formal learning: virtual and managed learning environments automated institutional and organisational processes and pedagogies, and they continue to do so. The Web made it easy to apply group-based ways of learning over geographic and temporal distance that were formerly difficult or infeasible due to cost, but in most cases they directly transferred a method and approach to learning shaped by millennia of experience, with only marginal changes to pedagogies and learning designs to match. But the Web added capacities, affordances and scale that enabled new modes of engagement.

The 1990s saw an explosion of network accessible content and, to cope with that, the growth of search engines and directories that attempted to track and manage this information. The first generation used either automation or armies of human editors to attempt to organize and to make sense of the rapidly growing torrent of data flowing around the Web but they were slow, unreliable and prone to abuse. Towards the end of the 1990s a new breed of search engine emerged, spearheaded by Google, that made use of implicit recommendations of those linking to other sites (Brin & Page, 2000). This was the first and remains among the most successful of approaches to using the crowd to help the individuals in that crowd to learn, a very different kind of use of other people than traditional closed publishing or group models of learning. This is an example of collective intelligence (e.g. (Segaran, 2007)) or, more simply, a 'collective', a cybernetic combining of individual actions through an algorithm to affect the actions of those and other individuals, in an endless feedback loop of self-organising emergence.

The increasingly read/write Web opened opportunities for mass-cooperation, beyond simple collaboration. Blogs and, to a lesser extent, other read/write technologies such as wikis and link sharing sites were the vanguard of a new breed of social software, moving beyond self-publication of the traditional one-to-many mode and the closed circles of group dialogue. The result was intricately linked and tagged networks of comments, trackbacks, and blogrolls that formed patterns, mined and re-presented collectively by sites like del.icio.us, technorati.com and Diigo. Towards the middle of the 2000s social networking technologies appeared, with sites like Friendster, Orkut, Bebo, MySpace and Facebook reaching massive populations. These social adjuncts soon began to be used in informal learning and to a lesser degree in formal contexts as means for seeking and providing help or information in timely and distributed ways. Networked learning is about connections that fuzzily extend through individuals and their artefacts, without the hierarchies, exclusionary membership, temporal restrictions and intentional collaboration inherent in traditional learning groups. Pedagogically, this resembles traditional social forms for informal ad-hoc learning but the scale and automation involved, especially when combined with collective processing, provides new adjacent possibilities and has led to many attempts to exploit the wisdom of such

crowds in more intentional and directed learning (e.g. (Downes, 2008; Siemens, 2005)).

In parallel with the growth of network-oriented tools, a range of tools like Twitter, Wikipedia, YouTube and Flickr enabled not only networks but a different and still looser kind of social form to emerge. They allow for a different kind of social engagement than those of the network or group - an impersonal, interest-oriented aggregation where people are the engine of learning, but not the object of engagement. Tags, hashtags and categories or topics in wiki pages and online help forums came to act as means of aggregating the actions of individuals who may or may not have any personal networked connection with each other but that benefit from one another's presence and actions. The flagship learning technology of this set-oriented way of interacting with crowds was Wikipedia, a farmed crowd-based tool that now vies with Google as the most significant online learning system in the world today. A composite of the one-to-many top-down and the many-to-many bottom-up, sets are intentional aggregations of people and their creations for some purpose but, unlike the group, one can be a member of a set without ever knowing it and, unlike the net, can learn from or share with others without ever being connected to other individuals. When algorithmically combined in a collective sets come into their own, forming (often with nets) the basis of collectives such as recommender systems and collaborative filters, tag clouds and reputation management systems.

RISKS AND RESEARCH AGENDAS

While the emerging crowd forms of nets, sets and collectives are responsible, singly and in conjunction, for satisfying the needs of more learners than almost any technology so far invented - apart from language and writing, we have not yet begun to fully exploit their potential. A range of research imperatives and needs for new literacies and learning designs emerge, some of which are discussed below, others that we have explored elsewhere (e.g. (Anderson & Dron, 2011; Dron & Anderson, 2009a, Dron & Anderson, 2007)).

Stupid crowds

To paraphrase Nielsen (2012) "the crowd does need to know what the crowd knows" Any system that feeds back what the crowd has done to the crowd creates known risks. Issues like confirmation bias (notably in the form of filter bubbles, where we see what we expect and want to see), preferential attachment (the so-called Matthew Principle whereby the rich get richer and the poor get poorer) and path dependencies (where sub-optimal solutions may emerge because of what happened earlier) threaten the efficacy of crowd function. Crowds also tend to be highly susceptible to gaming and intentional subversion (e.g. Google bombing, where organised groups can use the PageRank algorithm to artificially inject malicious or pecuniary biased content). Most large-scale systems using collectives are not designed with learning in mind and tend to use and magnify implicit or explicit preferences/actions rather than target learn-

ing needs. Wikipedia is a notable exception that circumvents many of these problems by top-down structuring and mindful farming of user behaviours. Some have tried to use the crowd to enable more useful patterns for learners to engage (eg. (Brusilovsky, Chavan, Farzan, Nejd, & De Bra, 2004; Drachsler, 2009; Dron et al., 2000)) but few have achieved large-scale success. Slashdot is, arguably, an exception, but has limited value due to the need for strong technical skills to take advantage of it.

Institutional mismatches and barriers

Institutional learning was and is designed for groups and tends to fit poorly with net and set modes of learning, further collectives, as decision-making agents, may act against the intentions of teachers. While the Web and similar technologies can provide a helpful adjunct and resource space, the informal fuzziness of nets and sets often collides with the top-down, guided, objective-oriented focus of traditional educational forms (Dron & Anderson, 2009b). This issue also affects efforts to provide structured courses beyond the institution such as large-scale MOOCs (Downes, 2008; Kop, 2011) or immersive learning contexts where it is all too easy to become lost in social space.

New frontiers

While the likes of Google Search and Wikipedia have achieved phenomenal success in supporting the discovery, dissemination and creation of new knowledge, they are no substitute for the long-term planning and carefully designed pedagogies that (we optimistically hope) are the basis of intentional formal learning. Although some have naively tried to aggregate learning paths in order to provide a map of learning territories (thus magnifying both successes and mistakes, often leading to sub-optimal learning) or applied ontologies to a subject area that map knowledge paths (that reflect experts' taxonomies but offer no guidance on the best ways to learn a topic), there are as yet no *effective* means for collective generation of long-term or effective learning paths. Learning is not just about finding new facts and gaining new competences but about developing ways of thinking and ways of being. A focus on the 'what' without paying attention to the accompanying process and ways we change and integrate knowledge as it is lived is a blinkered and dangerous perspective that opens up opportunities for naysayers and accusers to rightly bemoan the de-skilling and Googlization of learning (Brabazon, 2007)

CONCLUSION

To build systems, human, machine and cyborg, that make effective use of the new adjacent possibles that emerge in an age of mass sharing and communication we need to create soft and hard technologies, processes, methods, procedures and tools that move beyond traditional modes of group learning. It is not that there is anything fundamentally wrong with those older modes, and old technologies never die (Kelly, 2010), but with each new development the adjacent possible expands, enabling different ways of thinking, needs for new literacies and ways of understanding the social forms that emerge, different op-

opportunities for moving beyond what we already do. Learning and especially formal education instantiations have for too long remained stuck in individual and group contexts – there is much to be learned and gained in expanding these contexts. The fields are young and the problem landscapes are changing as fast as we can find solutions but the promise of new forms of learning engagement, already accounting for much of both intentional and informal learning on this planet, makes it a worthwhile and compelling venture to pursue.

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