The Distant Crowd: Transactional Distance and New Social Media Literacies

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Introduction

Sociality is not just a cultural phenomenon but is embedded in our genes as eusocial creatures (E. O. Wilson 2012). Learning is an innately social activity, and the processes of teaching, the passing of knowledge from one generation to the next, are well-adapted to our eusociality. The size and nature of the groups we have evolved to form has, so far, been codetermined by exigencies of our situated existence as, initially, bands of hunter-gatherers, evolving into agricultural then industrial societies. Dunbar (1996) suggests the size of such groups is naturally limited. Though his research has been challenged on multiple fronts (Russell, Shelley, and Killworth 1987; de Ruiter, Weston, and Lyon 2011), the vast majority of close social ties for any single individual are limited to a relatively small number of other individuals, and our learning generally occurs in relatively small groups. Larger organizational forms such as cities, nations, universities, or corporations are mainly constituted as hierarchies and networks that maintain close personal contact at a manageable number for any given person. The focus of this paper is on describing how, after countless millennia of gentle evolutionary change, the Internet is challenging us to discover new forms of sociality and, with it, new forms of social literacy to help us become more effective learners and citizens.

Transactional Distance

Transactional distance measures the psychological and communications gulf between learner and teacher and is determined by the relationship of dialog and structure in a learning transaction (Moore 1997). Dialog reduces that distance but, as structure and teacher control of the process increase,

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dialog diminishes (Saba and Shearer 1994; Dron 2007). Moore formulated the theory of transactional distance when most formal distance learning occurred using transmittive technologies such as books, study guides, tapes, television, and radio, sometimes supported by one-to-one technologies such as telephone, mail, or two-way radio. As networked media matured, especially the Internet and World Wide Web and as many-to-many communication technologies became easier and cheaper to use, the relevance of Moore's theory became clearer and its application broader. Technologies such as discussion forums, virtual learning environments, Web meeting tools, and immersive spaces largely replicated classroom methods in which it was easy to observe increasing and decreasing transactional distance across a wide range of pedagogies ranging from instructivist to social constructivist forms of teaching and learning. The theory has been used and validated many times (e.g., Lowe 2000; Zhang 2003; Dron, Seidel, and Litten 2004; Stein et al. 2005).

Groups

The pedagogies of formal learning have, until recently, been primarily concerned with either information transmission with high transactional distance (lectures, books, and so on) or dialogic learning with low transactional distance (classes, tutorial groups, apprenticeships, mentoring, seminars, etc.). This has codetermined the methods used, leading to the evolution of a range of institutional, theoretical, and methodological forms that emphasize traditional social groups. Groups, as used in formal learning, have a number of distinctive characteristics. Typically they offer closed membership and an intentional and often formalized process of joining and initiation. By and large, they are hierarchical, led by a teacher. They nearly always have both implicit and explicit rules of behavior. Mostly, they are time-limited and have a clear purpose and direction, shared goals and common practices. There is usually a purposeful progression through time involving a staged sequence of activities, often marked by a formalized schedule or timetable. When social interaction forms part of the pedagogical form, the emphasis is often on collaboration, of working together to achieve some set of learning outcomes. For many centuries we have embodied these features in the technologies that we have created to support formal learning: schools, faculties, courses, timetables, joining procedures, assessment regulations, and so on. We have continued that process in the use of online technologies. A typical learning management system, for example, embodies moderation of forums, differentiated roles, closed course group areas, assessment management systems, drop boxes for assignments, group scheduling, access-controlled course materials, and so on. Such structures not only embody but also reinforce the closed group structures that they represent and support.

By contrast, the read-write Web that has become dominant in recent years is an inherently social space in which the different social forms of *nets* and *sets* play a significant role, and, when actions of individuals are combined algorithmically, *collective* intelligence emerges.

Nets

The social form that most characterizes tools and environments such as blogs, shared bookmarks, media sharing, and social networking systems is the network. In a network, connections between an individual and others do not require people to join a distinct group, do not involve hierarchies, do not involve fixed rules, are seldom limited by time, and seldom have a defined purpose. Social networks emerge from the bottom up, and we may not even be explicitly aware that we are part of them. While a group contains and is constituted by a collection of individuals that makes it an identifiable entity, every individual's social network is different from every other individual's social network. Networks are, at least in principle, unbounded, and we only ever have a partial view of them, connecting with other nodes that are, in network terms, "nearby." Networks are and have always been powerful social forms in, at least, informal learning. We learn with and from our friends, acquaintances, coworkers, and communities. Networked learning is about connections that fuzzily extend among individuals and their artifacts, 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 (Siemens

2005; Downes 2008), most recently in the emergence of massive online open courses (MOOCs).

Sets

When we learn from a Wikipedia page (as readers or contributors), or share or pick up something useful via a Twitter hashtag, or contribute to or discover how to fix our computer or play an instrument using a public forum, a YouTube (http://www.youtube.com/) video, or curated objects in Pinterest (http://www.pinterest.com/), we are rarely teaching or learning with those we know. All we have is a shared interest, a commonality, typically discovered via a search engine. We are learning with and with the aid of other people, but we do not appear to become members of distinct groups and we make no direct connections with other people, although what we share may be a catalyst that triggers such engagement. This is about sets of people with common attributes but without (necessarily) explicit social connections of the sort implied by group or network membership. As with nets, we can be a member of many sets without knowing it: the set of people with a particular gene, for instance. Equally, we may know that we have a particular characteristic (an interest in bookkeeping, Lady Gaga, or a particular hair color, say) without necessarily recognizing it as significant to others. The set is a distinctive and common social form that has long been used in learning: people in our locales who we may not know, for example, who share knowledge via bulletin boards, or in academic tribes and subject areas with which we identify, or the categorizations in libraries around which we may engage in conversation with others browsing the same section—each can act as an aid to learning with others. However, the scale of the Web and the ease with which sets can be uncovered and exploited has made them a dominant social form in an increasingly connected world.

Collectives

Beyond sets and nets, we and others in an anonymous crowd are contributors to collective intelligence—a "collective" for short—an emergent agent that helps us to learn that is formed from the actions of ourselves and others, combined together algorithmically. Collectives are not a social form as such but are emergent entities that can arise from other social forms, especially the net and set. Again, this has parallels in pre-Internet times: the show of hands in a classroom that guides a teacher or the use of statistics to aggregate and examine behaviors of learners combine individual behaviors to guide our actions. However, the capacity of computers to embed richer algorithms and bring together people's activities on a grand scale has made collectives a far more significant factor in determining the paths and success of learning. Google's (http://www.google.com/) PageRank algorithm combines set and net social forms in order to recommend things that we may find more relevant in our searches (Brin and Page 2000). Amazon's (http://www.amazon.com/) collaborative filters use commonalities in behavior to recommend things we might find interesting to read or watch (Greg 2003). Facebook's (http://www.facebook.com/) EdgeRank algorithm presents us with posts and suggestions for friends that may assist our learning (B. Wilson 2011). Tag clouds show us topics that others have found interesting and guide us to useful knowledge and resources. In each case, the combination of algorithm and crowd results in an agent that takes on some of the roles traditionally played by a teacher, as guide, filter, and curator. When the social forms of sets and nets are algorithmically combined, whether the algorithms are applied by members of the crowd or are generated by machines, collectives become active agents that guide and assist our learning.

Aggregates

These social forms often partially or completely overlap. Sets and nets can be found within and extending beyond groups, groups may be viewed as (or emerge into) sets or nets, nets may be viewed as sets, and vice versa. We distinguish them because, depending on the kind of social and educational engagement we have or envision within them, they create different opportunities and constraints.

Transactional Distance in Sets, Nets, Groups, and Collectives

In a network, set, or collective, distinguishing a conventional teacher is often hard. However, Garrison, Anderson, and Archer (2000) lay the foundations for thinking more abstractly about the teacher role by identifying "teaching presence" as a feature of an intentional learning activity. The teaching presence may not be a formally identified teacher but may come from other learners, the author of a book, the director of a movie, one's family, one's friends, and so on. An

agent from which one learns may not even be aware of being a teacher: for instance, if we watch a video of a guitar player to understand better how to play the guitar, or if we observe the techniques used by the director of that video to better understand how to make videos, it is not necessarily the case that the creators of such content intended to play an instructional role. Thus, transactional distance may be redefined not as the communications and psychological gulf between learner and teacher but as the gap between learner and teaching presence. Where a learner is able to engage in dialog with that teaching presence, transactional distance is lower than where that teaching presence acts mainly as a means of structuring and controlling the knowledge and process of achieving it.

Teaching Presence in Groups, Nets, Sets, and Collectives

Within a traditional educational group social form, we implicitly or explicitly put our trust in the teacher to reliably inform us or guide us. We may sometimes misplace our trust, but, on the whole, the processes by which teachers are employed, the educational systems of which they are a part, the editorial systems in books and journals, and so on, all lead to quality control, accountability, and quality assurance processes that tend to increase the likelihood that we will learn better with a teacher than without. However, networks, sets, and collectives, lacking the hierarchies of control that characterize groups, do not so obviously offer such guarantees of reliability.

In a network context, Downes, Siemens, and others have described the teaching presence not as a guide but as a role model (Chatti, Jarke, and Quix 2010). Participants in a MOOC, for example, learn ways of thinking and behaving by observing and interacting with those in a network who appear to be doing things well. The "teacher" is thus a distributed entity, emerging through the interactions and frequently a serendipitous discovery. Transactional distance is often consequently very low, involving direct engagement with multiple teaching presences.

In a set, the teacher is often unknown or even anonymous. When we turn to Wikipedia to learn something new, for example, we rarely have any idea who has created the page. If we contribute to Wikipedia pages, we seldom know with whom we are cooperatively creating content, and yet, with others, we construct knowledge as a result. Similarly, when we seek help from a forum post, we may know nothing of the poster and may engage in such a group without ever knowing anything of its contributors apart from the knowledge they share. In many ways, set-oriented interactions resemble the anonymous, high-distance engagement of books or videos but with important differences: we can talk with them, affect their members fairly directly, and contribute to them ourselves.

Collectives are still more diffuse and anonymous. We seldom have the slightest clue about the many actions that have been aggregated and transformed by a Google search or an Amazon recommendation. In many ways, we appear to be interacting with nothing but a machine, and yet that machine is driven and fueled by a crowd, often a crowd of which we are a part. Moore distinguishes between various forms of interaction between teacher, content, and learner. In many ways, interaction with a collective is like learner interaction with content. When performing a Google search, people are seldom strongly aware that, in actuality, they are interacting not only with content related to the set of keywords they seek but also with an indefinitely large network of individual people who have given implicit recommendations of the things they seek. And yet, in a meaningful way, this is a social interaction with a crowd. Moreover, in recent years, Google has introduced a feedback loop that takes into account the behavior of those seeking content, thus leading to a form of indirect dialog in which the searcher is an active participant in determining the results of future searches. Similar feedback loops drive collaborative filters, recommender systems, reputation systems, and much of the machinery that drives the modern Web. This is a problem.

The Stupidity of Mobs

While crowds can be smart, they can equally become stupid mobs and, in some cases, manipulable by others. To paraphrase Nielsen (2012), "the crowd needs to know what the crowd knows." Any system that feeds back what the crowd has done to the crowd creates known risks.

Confirmation bias, notably in the form of filter bubbles caused by personalization tools that show things like those we have seen before, can blinker us to novelty, until we eventually see only what we expect and want to see. We thus reduce or eliminate the benefits of serendipitous or uncomfortable encounters, reducing the potential for creative

cross-fertilization of ideas and beliefs and limiting learning to things similar to what we already know (Pariser 2011). While one can deliberately reintroduce randomness and take steps to hide one's trails from automated agents, the seductive appeal of seeing things relevant to one's own interests and needs makes the costs of doing so high: such automated sense-making tools are virtually indispensible and efficient in an age of infoglut where the fire hose of Internet information constantly threatens to overwhelm us.

Preferential attachment, the so-called Matthew principle whereby the rich get richer and the poor get poorer, can combine with path dependencies (where suboptimal solutions may emerge because of what happened earlier) to severely threaten the efficacy of crowd function. Watts provides an experimental demonstration of this effect in determining the position of songs in charts, where similar groups exposed to the same songs provided wildly disparate rankings that were significantly determined by exposure to the rankings of the songs by others (Watts 2003). Knight and Schiff analyze the real-world effect of prior votes on presidential primaries in the United States, showing that early voters have around 20 times the influence of later voters on the results (Knight and Schiff 2007). Where a crowd receives feedback that tells its members how previous members have acted, the crowd becomes little smarter than the first to act (Surowiecki 2004).

Gaming and intentional subversion (e.g., Google bombing, where organized groups use the PageRank algorithm to inject malicious or pecuniary-biased content) are a constant risk. For example, a search in Google in 2007 for "miserable failure" returned as its top result George Bush's biography—a result of concerted linking by an organized crowd of mischievous critics (Cohen 2007).

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 targeting learning needs. Wikipedia is an exception that circumvents many of these problems by top-down structuring, a cadre of active human and agent monitors, and mindful farming of user behaviors. Some have tried to use the crowd to enable more useful patterns for learners to engage (e.g., Dron et al. 2000; Brusilovsky, Chavan, and Farzan 2004; Drachsler 2009), but few have achieved large-scale success. Slashdot (http://slashdot.org/) is, arguably, an exception but has limited value due to the need for strong technical skills to take advantage of it, and, though some have tried to do so (Wiley and Edwards 2002), attempts to replicate it in educational contexts have (to date) failed.

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 and Anderson 2009). 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 becoming lost in social space is all too easy. Finally, formal educational systems are based on security and privacy provision, enforced and maintained by professional privacy commissioners, legislative authorities, and zealous information technology professionals. Both students and teachers alike have objected to the challenges of contributing to the more open forums and structures associated with nets and sets.

Social Literacies for Learning

Most of us have learned to learn in formal groups and may thus be ill-prepared for the complexities that can arise in other network-enabled social contexts. If we are to learn effectively in new social spaces that make use of different social forms from those we have grown up with as learners, we need to learn to use them well.

Credibility and Value

The potential lack of reliability and credibility when the teacher is distributed (in a net), anonymous (in a set), or emergent (in a collective) means that a greater onus is placed on crowd-based learners to ascertain the reliability of both the process and content of learning, to take greater control and responsibility for their learning, and to filter the torrent of information flowing at them. The crowd itself can help, if the learner is willing and able to acquire the skills of using it. Despite the risks, collaborative filters and other collective tools can, when used critically with awareness of filter bubbles and biases, help to

identify reliable and trustworthy sources. In sets, ensuring sufficient diversity is vital to forestalling the potential blind spots, errors, and filter bubbles that can ensue. In nets, the opinions of others are often explicit or implicit in number of connections and when viewed critically with awareness of preferential attachment and similar issues.

Building and Sustaining Networks

Effective use of networks requires skills in building and sustaining them. Some of those skills are technical: knowing how to discover people and resources of interest. Others are social: knowing how and when to contribute, how to post for the maximum impact, how viral ideas spread through networks.

Moving between Social Forms

Networks often coalesce into ad hoc transient groups or their more permanent counterparts (Koper, Rusman, and Sloep 2005), and groups decohere into networks just as easily (e.g., at the end of a course). Likewise, sets can often be found within networks, or networked connections may form from serendipitous set encounters. Knowing how and when this transition occurs is as useful as the skills needed to build and sustain such forms when they do arise.

Identity, Trust, Privacy, and Ownership

Management of identity is crucial among the new social literacies. In real life, people present different facades in different social contexts, but the majority of current profiles in social systems fail to give much control over this. Although most social networking systems allow only a single identity to be portrayed, the majority do allow some filtering so that only trusted individuals (e.g., those with whom we have connections or those with whom they are connected) see certain aspects of our profiles. Also common is for different social networking tools to be used for different purposes: Facebook (http://www.facebook.com/) for friends and family, LinkedIn (http://www.linkedin.com/) for business associates, Academic.edu (http://www.academia.edu/) for academics. Choosing the right network for the right facade or post will be a key skill for as long as this remains the most common method for establishing one's context. Technologies that are on the near horizon will allow different facades to be presented to different people, which will entail the need to learn new skills of social facade-building (Dron, Anderson, and Siemens 2011).

A similar set of skills relates to the content we create in nets. Many systems give the ability to create lists, circles, or collections of people to whom differentiated access may be given, and some, such as Google+ (http://plus.google.com/) or Elgg (http://elgg.com/), make this a central feature. Again, being able to selectively communicate with relevant sets, nets, and groups is an important skill.

Cyberbullying, the hiring and firing of people on the basis of social networking activities, and stalking and thefts informed by knowledge of individuals' whereabouts make literacy about privacy and access control a pressing need. This is becoming more important as more and more of our digital traces linger in networks and sets and as the virtual world increasingly blends with the physical in geolocated applications.

Multidimensionality

We dwell in multiple social spaces: sets, nets, groups, and collectives coexist on desktops and mobile devices, constantly streaming emails, tweets, instant messages, texts, RSS feeds, and site notifications. We simultaneously inhabit multiple social spaces of many forms. The intersection of multiple social forms through multiple channels is among the largest new problems in social learning and puts learners in a constantly shifting range of transactional distances with, potentially, many teaching presences. Prioritization and management of this multidimensional space is a central competence for the crowd-based learner.

Combinatorial Strategies

In all cases, whether using nets, sets, or collectives, cross-checking and verification of value is essential. While critical and filtering skills are crucial, one of the most important social competences for the networked learner is to amalgamate and aggregate, to triangulate using information from multiple social sources to ensure trustworthiness as an aid to learning of the individual or individuals with whom they engage. Recognition of the mode of interaction, its weaknesses, and its strengths can introduce the need for a diversity of mechanisms needed to more reliably evaluate the credentials of the person or resource with which a learner interacts. Similarly, knowing as much

as possible about the algorithms underpinning a collective application can be useful. However, this can be difficult to ascertain, because such algorithms, including the more than 200 factors used by Google Search and the unknown details of Facebook's EdgeRank, are often closely guarded proprietary secrets.

Conclusions

Emerging Web and mobile technologies have changed or introduced many competencies. Social literacies for new media are concerned with collecting, correcting, creating, and organizing socially active elements in digital spaces. They attempt to make sense in an era of plenty without succumbing to the risks of digital blindness, crowd-think, intentional harm, and bias. Few of these literacies are truly novel or without counterparts in earlier technologies and interactions. However, scale and automation raise the stakes for both benefit and peril. Control of our learning is now distributed, providing us with countless choices, but choice without the power to exercise it does not increase our own control: we can be overwhelmed with choice (Schwartz 2004). The more diffuse our interactions with teaching presences, the less we are able to control them ourselves. Transactional distance that was once a measure of a single linear dimension of control and communication between learner and teacher is now more of a statistical measure of area that crosses many dimensions and social forms. Our social learning environment is no longer dominated by linear engagement with single teachers but exists on a plane inhabited by indefinitely many teaching presences that can be both transactionally distant and close.

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