

REFLECTION

The fog of online learning

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ABSTRACT

The authors recognized a close similarity between practices used in online genealogy research and those common in online education. Uses of a popular online database service were examined within a peer instruction community dedicated to researching a family history topic. Three community subgroups were divided into leaders, who base their work on external sources, and followers who copy the leaders' conclusions. The accuracy and error levels of the 21 family trees produced by these researchers were calculated in relation to data obtained from offline archives. The trees created in the online process all contained flawed details and invalid conclusions due to practices similar to those of massive open online courses. The inconsistent reliability of the online approaches is discussed in terms of the 'fog' that descends upon knowledge when facts are distorted by academic jargon, disciplinary trends, and institutional priorities, and which increases with its transmission to others by non-experts.

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Introduction

Those in favor of peer instruction point to the increased student involvement it generates. They cite Mazur's (1996) observation that learning from other students offers "more than a mere regurgitation of printed materials" (p. 2) provided in the traditional classroom context. Mazur also said, however, "Am I suggesting that we stop teaching altogether? Certainly not" (p. 2). He stressed that teachers should continue helping the student to interpret reading material in the light of alternative perspectives. Boud (2001), on the other hand, emphasized the economic benefits of peer instruction: "At a time when university resources are stretched and demands upon staff are increasing, [peer learning] offers students the opportunity to learn from each other" (p. 3), although he too stressed that the teacher still makes a useful contribution (p. 2). Siemens similarly, while recommending the active interpretation of information by learners in connecting with one another, indicated that educators should monitor the students' conclusions and occasionally guide them (as cited in Giesbrecht, 2007). But a fog has now gathered over these relatively balanced views; and the merits of learner-based as opposed to teacher-based education are now rationalized in baseless generalizations such as "students feel more comfortable asking questions to other students rather than their professor" (Tennessee Teaching and Learning Center [TTLC], 2015, p. 1) and "peers

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have considerable influence on one another, and certainly more influence than an instructor" (TTLIC, 2015, p. 1). The TTLIC document goes on to suggest that students who teach other students reduce classroom frustration and "gain valuable teaching experience" (p. 1), although it omits to say what use that will be to them if teachers are now to be outmoded.

Williams, Karousou, and Mackness (2011) warned against the trend toward exclusively learner-centered approaches, and against the assumption "that if only everyone had the Internet and everyone got connected to everyone else, learning would flourish." (p. 8). They cited the Hole in the Wall project (Mitra & Dangwal, 2010) as having fostered the idea that technology can replace the teacher; and they echoed Arora's (2010) criticism of the project for creating a "romance that tells of learning free from the chronic obstacles of formal schooling, and children liberated through self-learning" (p. 690). Williams et al. (2011) also indicated that efficient peer instruction is impossible when the knowledge at hand is still "emergent" and not yet fully defined; and they stressed that the construction of knowledge by learners needs to be carefully supervised with this in mind. Regrettably, ideals such as this are not easily implemented in an age where the massive open online course (MOOC), with student enrolments numbering in the thousands, has rendered traditional styles of supervision by teachers impractical.

In one of the early MOOCs (2008), Siemens and Downes sought to facilitate the students' task of constructing their knowledge by providing them with daily update information assembled by automated content aggregation; and Mak, Williams, and Mackness (2010) reported that this process was popular with the students owing to the daily involvement of one or more instructors in it. Reviewing student interactions in the same MOOC, Williams et al. (2011) observed that "connectedness per se does not ensure interaction, let alone emergent learning," while Mackness, Mak, and Williams (2010) criticized the free-for-all atmosphere of the 2008 MOOC, concluding that "constraints and moderation exercised by instructors and/or learners may be necessary for effective learning ... to reduce confusion, or firm intervention to prevent negative behaviors which impede learning" (p. 272). Crouch and Mazur (2001) had made the same point in recommending the use of trained teaching assistants in peer instruction generally: "TAs have a significant impact on students' experience ... it is vital to motivate TAs as well as students' (p. 975). Updating this research in the MOOC context, Ashton and Davies (2015) have examined the controversial process whereby MOOC students' grade each other's work: "if students are provided with proper instructional guidance during the feedback process," they conclude, "they are more likely to provide each other with consistent and reliable feedback" (p. 329).

Many of these conclusions are statements of the obvious, for the importance of student motivation and prior experience and the need for trained teaching input have been recognized throughout educational history. But, to echo Gore's (2006) climate change treatise, they are also becoming inconvenient truths. To serve the popular trend and possibly their institutions' goals, current researchers are tending to ignore these truths in seeking refinements to peer instruction approaches rather than challenging its foundations; and it may be argued that reiterating the time-honored principles of educational theory and practice provides useful reminders in an era that has apparently forgotten them, and in which the directness of Bruffee's (1980) comments now seems politically incorrect: "How can student peers, who are not themselves members of the knowledge communities they hope to enter, help other students to enter those communities? Isn't collaborative learning the blind leading the blind?" (p. 94).

Method

The co-author of this article (JB) recently had an unusual opportunity to attempt an answer to these questions. In the spirit of the times, he subscribed to an online “community” dedicated to investigating one’s family tree. Founded in 1998 as MyFamily.com, Ancestry.com is the most widely advertised genealogical database service, claiming 16 billion records, over 2 million paying subscribers, and an accumulation of 70 million user-generated family trees (Ancestry.com, 2015). JB had formed a hypothesis that one of his ancestors is a William Baggaley born in the late-eighteenth century in a particular town in the British Midlands; and he wished to create a profile of him in order to find clues to posthumously “connecting” with him. The Ancestry.com database currently contains over 100,000 records of William Baggaleys of various spellings, though only 598 born in the right period. Sifting these records is still a daunting challenge, but many genealogical databases provide automated search tools in order to alleviate the problem. With names like *SmartMatch* and *SuperSearch*, these tools resemble the *I’m feeling lucky* button on a Google search, reducing millions of possible ancestors to a handful in seconds. Ancestry.com’s automated winnowing process rapidly focused the current search on 21 family trees already created and saved by other subscribers, and pointed to a particular William Baggaley born in the right year and place. JB had unwittingly become a member of a specialized interest group devoted to the esoteric research topic of William Baggaley.

This very specific genealogical study strikes the authors as closely similar to experiences commonly reported by MOOC participants in evaluation studies such as those cited above. Naturally, few people would be likely to consider enrolling in a MOOC as a viable basis for genealogical research, although in finding himself being spoon-fed with the unverified online conclusions of other researchers – some well-informed and others clearly not – with no expert supervision to guide them, JB might just as well have enrolled in a MOOC of this type. The 21 trees of the other participants collectively painted a profile of a William Baggaley with 17 children borne by one wife over a 28-year period. The actual facts are that there were in fact two William Baggaleys (see next paragraph) – cousins born in the same year, living on the same street, with the same occupation later in life, and with different wives and approximately 17 children between them. The online tree researchers’ confusion on this led them to a wide range of interpretations. Three distinct researcher subgroups were identified differing on specific details. Group/A stated that William Baggaley was born early in the year in question; Group/B said September; and Group/C gave differing birth dates for him and the impression that he had children concurrently with two wives who in turn were concurrently married to William Baggaleys in other villages. The groups’ trees represent three often clumsy rationalizations of the apparent facts of William Baggaley’s unusually large family and his wife’s advanced age while still bearing them (although conceivable)! One researcher posted two separate trees indicating that he recognized the existence of two William Baggaleys. Unfortunately, his depiction of them as sharing the same wife mars his conclusions’ reliability.

JB was able to assess each researcher’s basic details and overall conclusions because 35 years ago co-author SJ conducted a one-name study of Baggaleys (and spelling variants) in central England from the 16th to the 19th centuries. She collated 1500 pre-1840 Baggaley records in countless visits to parish churches and local and national archives, and created a relational database to sort them on an old Apple IIe computer. Many of these records

are not contained in the public databases of Ancestry.com and other online sources even today. Today, SJ's records are a gospel against which the different William Baggaley trees on Ancestry.com can be assessed.

Analysis of results

The accuracy of the 21 trees was scored in relation to whether they were right or wrong on 15 details essential for confirming William Baggaley's identity and those of his immediate forebears. These details included names of parents, paternal grandparents, and spouse, and birth dates and places. The scoring tolerated inconsistencies in dates and spelling due to the varying interpretations of eighteenth century scribes and transcribers. Secondly, the trees' online researchers were classified in terms of their Ancestry.com user profiles – self-descriptions including length of time as a subscriber, number of years involved in genealogical research, and whether or not their research has been based on external sources such as census records, wills, trade directories, military and prison records, and newspaper articles. Nine of the researchers claim that they use multiple sources in their work. These researchers are classified as group *leaders*, while the remaining 11 (*followers*) state that the only records they use are the family trees already created and saved by others. (Note: The 20 researchers yielded 21 trees because, as mentioned above, one researcher created 2 trees containing different interpretations of the data.)

This ad hoc group of William Baggaley researchers thus represents an online “learning community” of leaders and followers, working asynchronously on an unpaced learning task over several years. If the followers are shrewd or lucky enough to copy an accurate tree, they become indistinguishable from the leaders, although in relying totally on the leaders' conclusions they are in no position to verify them. In fact, close inspection of the leaders' trees reveals that 8 of them are identical to others in their 3 subgroups, complete with exact wordings and errors. Thus, as few as 3 of the 20 researchers may have actually conducted any source-based verification. In formal education, copying others' work might be regarded as plagiarism, though in the informal genealogical community it tends to be seen as an act of friendly sharing. Similarly, in peer instruction contexts, following the conclusions of other learners defines acceptable learning, although verifying and changing the wording of copied material occasionally might be considered advisable.

A group photo of the 21 trees is presented in Figure 1. The bars in the diagram represent the percentage of correct details in each tree on the 15 essential family history issues. In deference to the seating positions recommended for peer instruction by Monterola, Roxas, and Carreon-Monterola (2008), the leaders' trees are depicted on the back row of the diagram with those of their followers in front, an arrangement which apparently helps lower-performing students to do better. (One wonders what Monterola et al. must think of the seating positions in online learning.) The figure shows the trees produced by Group/A's leaders standing tall among those of their followers, with 100% accuracy on the 15 essential details. The followers' details range in accuracy from 73 to 33%. The accuracy of the details in the Group/B and Group/C trees ranges from 80 to 17%.

Even after collating highly accurate data, however, researchers can still interpret them wrongly. This may be due to their lack of research experience or to inaccuracies in the facts underlying their conclusions. Figure 2 compares the overall accuracy and error levels of the information collated by leaders and followers in the three researcher subgroups. The

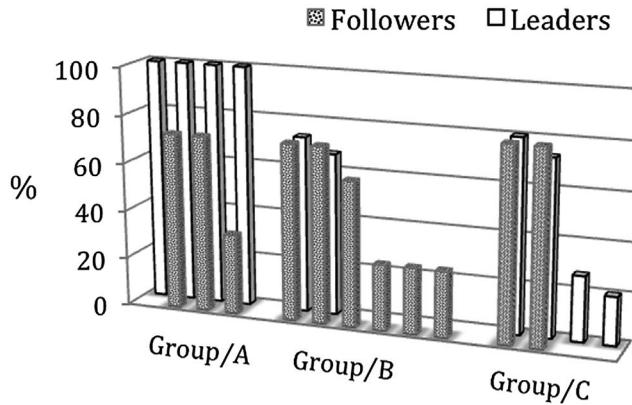


Figure 1. Accuracy of the details collected by the three researcher groups.

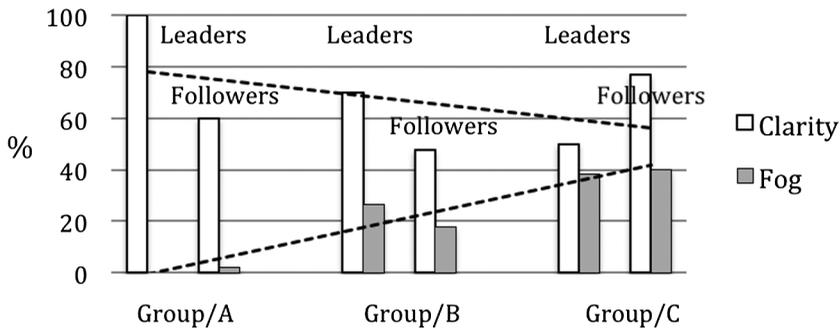


Figure 2. Accuracy (clarity) and error (fog) ratings of the three researcher groups.

average proportions of correct and incorrect details are defined for dramatic purposes as *clarity* and *fog*. The more accurate a group's scores (clarity), the lower its error level (fog). Thus, the relatively accurate data collected by Group/A's leaders are accompanied by fewer erroneous details, while Group/C, which received the least accurate leadership, produced a set of data, 40% of which is unrelated to the William Baggaley in question.

Discussion

Examining the particular peer-based environment in this online genealogy example reveals five factors causing the clarity of knowledge to diminish and facts to become fogged.

- (1) *The wish for a quick fix.* Genealogy research is expensive, the work involved is time-consuming, and as a result users have an intensified need for rapid results. The majority of the 20 researchers compared in this exercise have shown their readiness to accept even highly flawed conclusions and to adopt them second-hand without question. Formal online courses can also be expensive and time-consuming, and the customary styles of leaders and followers are easily recognized in online educational communities. "Nice point. I agree with you," says one follower. 'Great tree,' says another. "I'll use it as my own."

- (2) *Lack of ease with online protocols.* This was a major reason suggested by Mak et al. (2010) for low learner interaction and high dropout rates in the 2008 MOOC of Siemens and Downes. Participants had different levels of ease in using the protocols of forums and blogs in the course, and they either shifted from one to the other if they had problems or stopped interacting altogether. In the genealogy exercise, lack of facility with online protocols designed to expedite conclusions is seen in users' failure to filter the records available to them via a well-designed series of search commands, and in relying instead on the flawed conclusions of others.
- (3) *Lack of skill in interpreting data.* Inexperienced family history researchers commonly fail to appreciate the sheer immensity of the historical archive and of the high probability that multiple individuals have lived in the same time and place with the same name. In forming their conclusions, researchers need to be aware of first-name usage statistics (William was the third most popular given name in Britain in William Baggaley's time: Galbi, 2002); of the fact that unusual family names can be common in particular regions (Baggaley is a common name in that area of Britain to this day); and of the first-name patterns whereby children are named after their parents. If confusion and error can arise in relation to the relatively unusual name William Baggaley, how much more likely they would be if the name were Smith.
- (4) *Lack of experience in instructing others.* The parallel between the online genealogy situation and formal peer instruction is not perfect, for few genealogy database users are likely to embark on their research knowing that they will be acting as peer examples for others. They are likely to save a draft tree without securing its privacy, and without realizing that it immediately becomes available to others as a peer-based model. Nonetheless, when a commercial database service features such sharing facilities and encourages its subscribers to use them, it creates a peer-based learning environment comparable with those provided in formal online education. Whether its activities take the form of direct peer instruction, peer-sharing, peer-copying, or even peer pressuring will vary from one group to the next, based on the soundness of the pedagogy underlying the activities' design and the skills of group members to act as instructional leaders.
- (5) *Tree aggregation.* If only skilled and experienced family tree researchers used online databases, the service providers would soon go out of business. The services' automated search procedures, designed to help millions of amateur users to get quick and gratifying results despite little or no research experience, feature search algorithms curiously similar to the content aggregators available in MOOC design. In the right hands these are powerful tools, but amateur users may not question whether their selection criteria are appropriate for the task at hand. This risk applies to content aggregation in online contexts generally.

The unquestioning acceptance of online learner-based conclusions by amateur genealogists is succinctly summarized by Powell (2014):

Their research then makes its way into new genealogy databases and collections, further perpetuating the new "family tree" and amplifying any errors each time the source is copied ... [But] the family information that is freely published in many Internet databases and Web sites is often unsubstantiated and of questionable validity ... The trick is to learn how to separate the good online data from the bad.

Powell gives detailed guidelines for checking the sources of learner-based conclusions, which online educators should emphasize to their students before encouraging them in learner-based methods. If they do not, errors will continue to be amplified until, as illustrated by the trend lines in Figure 2, the fog may eventually eclipse the facts, and researchers lose sight of the right questions for clearing it.

Conclusions

The fog of online learning takes two forms. Anxious to save costs, many educational institutions are encouraging learner-based approaches and exhorting their teachers to develop MOOCs as their platforms. The first type of fog arises from institutional priorities and disciplinary trends of this kind, which lead established practices to be abandoned and cost-saving but flawed approaches to be applied in their place. The second type of fog is the mass of errors that gathers around knowledge that “re-emerges” in confused situations and goes unchallenged – a process described in the terminology of Fromm (2005) as “negative emergence.” The fog thickens as coats of jargon are applied to poor conclusions in order to protect them from scrutiny and to unoriginal ones to make them seem new. In the current family history exercise, online sources proved less adequate than data that have been available in the public record for centuries. Handsome but inaccurate online research reports were generated by participants in this exercise, which are doubtless now being handed down to children and grandchildren as the authentic record of their family background. Potentially millions of online family history researchers have already created a fog-filled record in this way. With each new flawed set of conclusions that emerges, the fog around the facts increases until, with luck, its contradictions and confusions are discredited. The genealogy example illustrates that peers who “have considerable influence on one another, and certainly more influence than an instructor” (TTL, 2015; p. 1) can pass on seriously distorted conclusions to each other, and that generalizations about peer instruction such as “students feel more comfortable asking questions to other students rather than their professor” (TTL, 2015, p. 1) are simply unacceptable.

In defense of exclusively learner-based methods, it may be argued that even flawed results are justified when they assist in the “emergence” of knowledge at an early stage. But the facts about William Baggaley emerged long before the current search for him, when they were recorded in the eighteenth–nineteenth centuries by, for example, registrars, parish and municipal clerks, and census enumerators. All the information required for a reliable if limited set of conclusions about the two William Baggaley cousins was available online to the 20 researchers in this exercise, although checking it required modest skill and determination, and few of the researchers rose to the challenge. As a result, they caused the solid knowledge of years gone by to “re-emerge” online in an incomplete and foggy form, as when written records were lacking in the Dark Ages of history (Dwyer, 1998) and the era became difficult to interpret. The confused conclusions that can be generated by online peer instruction are not an acceptable alternative to the kind of knowledge that emerges from reliable facts and tuition.

This article does not set out to suggest that peer instruction in its many forms is better or worse than other instructional approaches, nor that particular types or combinations of peer-based method are essentially better or worse than teacher-based education. Generalized conclusions on variable issues such as these are impossible to make anyway, and risk being statements of the obvious – for example, teachers should be trained, students should be motivated,

approaches should be balanced – as has been illustrated by some of the citations in this article. The effects of media and methodology depend on far subtler interactions and levels of “emergent knowledge” than can reliably be anticipated from one individual and situation to the next; and the current article has neither a technocentric message nor a technophobic one, for good and bad teaching is to be found in all types of education. The moral of this commentary is that approaches such as peer instruction need to be evaluated with emphasis on the advantages and problems that are evident in the ways in which they are used. The online genealogy study thus provides a valid example of an online community whose members tended to be deeply influenced by the flawed conclusions of other researchers, owing to the ease with which they were able to copy their reports rather than referring to original sources. Focusing on the fog as well as the clarity of the knowledge that emerged in this situation has helped us to approach the peer instruction topic free of the prejudices evident in one-sided statements such as “peers have ... certainly more influence than an instructor” (TTLC, 2015, p. 1). Such generalizations provide a disservice to education, and spread fog at the expense of clarity as surely as inadequate usage of source materials led to poor learning in the online genealogy example.

Since conducting this study, the first author has lurked in another online learning “community” whose contributors, like him, have suffered a computer crash and sought remedies. The experience has reminded him of another foggy phenomenon with which he frequently had to deal in 15 years of online teaching: that useful responses to learners’ questions are regularly eclipsed by a welter of unhelpful comments, frequently inaccurate and condescending and at worst downright rude. This is a further aspect of the fog that is a significant reality of the 21st-century online learning environment. Teachers may prove to be even more essential in this context, as experts, guides, and arbitrators, than in face-to-face situations. Expert input is still needed, for instance, regarding many genealogical questions that remain about our Old Father William. To find the answers, we will not be relying on the filtering methods of online databases nor on the second-hand conclusions of unrated researchers. Online peers have already provided us with unsubstantiated links to ancestors dating back a thousand years or more, and it is to be hoped that scholarship will be brought to bear upon these conclusions in order to verify them. Without independent confirmation, however, it would be rash to accept such learner-based conclusions as gospel.

“You are old, Father William,” the young man said,

“And your hair has become very white;

And yet you incessantly stand on your head –

Do you think, at your age, it is right?”

(Lewis Carroll, 1898, p. 94)

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes on contributors

Jon Baggageley is Emeritus Professor at Athabasca University, Canada. Recent books include *Harmonizing Global Education* and (with Tian Belawati) *Distance Education Technologies in Asia*.

Sheila James is a writer and social historian, whose careers have included professional genealogy research.

The authors' collaboration on this article is prompted by the conclusion that in modern times we've lost more knowledge than we've gained.

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