

Applying learning analytics to smart learning

— ethics and policy

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Learning analytics

“Customers who bought items in your basket also bought...” We are all familiar with the outputs (if not the underlying concepts) of business analytics, whereby retailers analyse previous buying behaviour to suggest products or services. These analytics use data-mining techniques, to extract ‘previously unknown and potentially useful information from data’ (Frawley, Piatetsky-Shapiro & Matheus, 1992, p.58). These techniques have been used in a wide range of fields from healthcare to detecting fraud, and are now being applied to education (Romero-Zaldivar, Pardo *et al.*, 2012). Learning analytics combine technologies from computer science: data and text mining, and data visualisation with pedagogy, social science and psychology, to gain a greater insight into how students learn online.

As learning analytics moves from the domain of computer science research into practice, and from the hands of senior management to individual teachers, these tools will allow practitioners to undertake more nuanced analysis of the impact of social learning activities.

Analysing tweetchats – an illustrative example of ethical issues in Social Learning Analytics (SLA)

As an illustrative example some learning analytics have been applied to the tweetchat facilitated by @LTHEchat, a collaborative project to discuss learning and teaching in Higher Education.

Network analysis

Figure 1 provides the network analysis of a tweetchat produced using Martin Hawksey's *TAGSExplorer* tool. The tool allows rapid identification of the 'top tweeters', and archiving the tweets for further analysis. Network analysis allows the monitoring of the community as it grows, coalescing around information providers or forming smaller sub-communities. It can also be used to identify participants who appear to be disengaged.

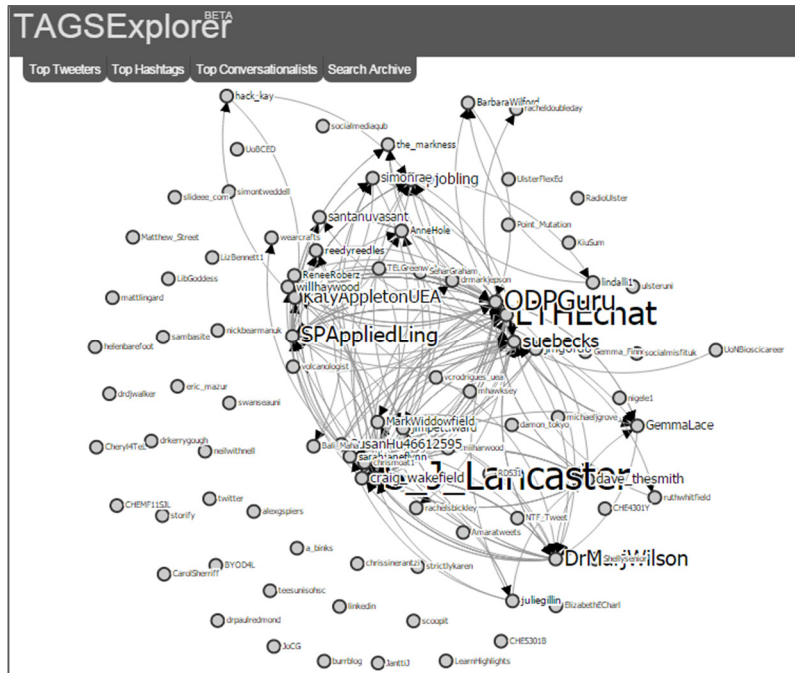


Figure 1: Network analysis of tweetchat produced using TAGSExplorer

Analysis of the discourse

Whilst visualising the network can provide some insight into the dynamics of the community, analysis of the actual discourse can be more informative of how well each participant understands or contributes to the topic. The discourse could be analysed to identify a range of parameters, e.g. the number of questions posted by an individual, the number of posts that could be classified as off-topic, or that contain factual or conceptual errors,

or provide links to other resources. This type of analysis could be very informative of learner engagement, understanding or dispositions.

Ethics of social learning analytics

What are the ethical issues arising from this analysis? Is the analysis acceptable if the tweetchat were part of a course, and the network and discourse analysis are used to provide directed feedback to a student? What if this was a retrospective analysis as part of a pedagogical research project then? Does it require informed consent? If the data has been put in the public domain does this make it acceptable to collate and analyse it for research? What if you want to integrate the SLA data with other institutional data, student grades or their educational or social history?

Policies for using student data

Current regulations and policies for using student data from learning analytics (in the UK) are covered by Common Law, the Data Protection Act (DPA) (1998) and the Human Rights Act (1998). In higher education this requires that student data is only obtained and processed in accordance with the legitimate interests of the institution. Typically students are informed that their personal data may be used for various teaching, research and administrative purposes. There is a tacit agreement that students agree to their data being used for these purposes when they register with the university. Does this only apply to the data that students share with the university or data they share via social media or on open resources? Some institutions stipulate that data may only be used for internal research, and the majority of UK universities require ethical review of all research involving data or material relating to human subjects which is not in the public domain. Evidence suggests that pedagogic research in general is not always submitted for ethical review (Regan, 2013). There are many reasons posited for this lack of compliance, including lack of clarity on:

- the distinction between research activities which require ethical review and scholarship or audit activities which do not;
- the extent to which projects which access corporate and public data are legitimised under the Data Protection Act (1998) or whether they require ethical approval and informed consent.

This situation may be exacerbated as data produced from social learning analytics is readily available, alongside the need for more evidence-based research on how students learn online.

Autonomy, trust and privacy

Kincaid and Pecorino (2005) argue that there has to be an element of paternalism in higher education due to the imbalance in knowledge and expertise between the teacher and the student. This unequal relationship requires that the student surrender some personal autonomy to the institution trusting that it will do them no harm and will endeavour to provide benefits through providing effective learning opportunities. The respect of privacy and the sharing of decisions about how personal data is managed and analysed is an important element in retaining student trust. An institution has statutory duties with regard to data protection and can be held liable for harm or loss caused where the legal duty has not been met. However data privacy is one of the most controversial aspects of online and digital interaction (Romero-Zaldivar *et al.*, 2012; Pardo & Siemens, 2014), with key players questioning whether the right to privacy exists in an environment where people are willing to share their personal information in return for free services (Mantelero, 2013). As the big online players (*Google, Facebook, Twitter and YouTube*) trade personal information for the right to access their services, are we complicit if we expect students to use these services in order to engage in collaborative or constructive learning activities? The recent Eurobarometer survey on 'Public perception of science and, research and innovation' (European Commission, 2014) indicated that "citizens do not consider the protection of personal data to be a high priority". However this may be indicative of either a focus on other priorities (health, employment and education), a lack of serious security breaches, or a lack of information or understanding of the scale and depth of personal information that is held by companies and institutions (Floridi, 2014). Furthermore, evidence suggests that students are unaware of the extent to which universities can track their online activities (Slade & Prinsloo, 2014).

Conclusions

As teachers make wider use of open educational resources and the diverse range of apps available on mobile devices, and are less constrained by the institutional VLE, the application of learning analytics to track student

engagement will have greater importance. It is important to monitor and evaluate the engagement of students with external resources and assess the impact on student progression, retention and success, as well as less tangible indicators of student learning. This information is critical to support individual students as well as inform the wider academic community for BYOD to become more widespread in education. However the use of student data has implications for the relationship of trust and respect between institutions and students. Whilst UK Higher Education Institutions have policies in place for the ethical oversight of research activities undertaken under their auspices, there is variable application and adherence to these policies with respect to pedagogic research. As analytical tools become more widely available, and the desire to apply them to pedagogic research to gain a greater understanding of the impact of the current changes in the learning landscape, it is critical that institutions develop policies for the use of learning analytics for scholarship and research activities.

References

- Data Protection Act. (1998). (c29). London: HMSO.
- European Commission (2014). Public perceptions of science, research and innovation. *Eurobarometer Special Surveys*. Online at: http://ec.europa.eu/public_opinion/archives/eb_special_419_400_en.htm.
- Floridi, L. (2014). Technoscience and ethics foresight. *Philosophy & Technology*. Online at: <http://link.springer.com/article/10.1007/s13347-014-0180-9/fulltext.html>
- Frawley, W. J., Piatetsky-Shapiro, G., & Matheus, C. J. (1992). Knowledge discovery in databases: An overview. *AI Magazine*, 13(3), 57–70.
- Hawksey, M. (2011). Twitter: How to archive event hashtags and create an interactive visualization of the conversation. Online at: <https://mashe.hawksey.info>
- Human Rights Act (1998) (c 42). London HMSO.
- Kincaid, S. & Pecorino, P. (2005). The profession of education: Responsibilities, ethics and pedagogic experimentation. Online at: <http://www.qcc.cuny.edu/>
- Mantelero, A. (2013). Competitive value of data protection: The impact of data protection regulation on online behaviour. *International Data Privacy Law*, ipt016.
- Pardo, A. & Siemens, G. (2014). Ethical and privacy principles for learning analytics. *British Journal of Educational Technology*, 45(3), 438–450.
- Romero-Zaldivar, V., Pardo, A., Burgos, D. & Delgado Kloos, C. (2012). Monitoring student progress using virtual appliances: A case study. *Computers & Education*, 58(4), 1058–1067.

Regan, J. (2013). Risks to informed consent in pedagogic research. *Journal of Perspectives in Applied Academic Practice*, 1(1), 25–29.

Slade, S., & Prinsloo, P. (2014). Student perspectives on the use of their data: Between intrusion, surveillance and care. In: European Distance and E-Learning Network 2014, 27–28 October 2014, Oxford, UK, 291–300

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