Student Learning Analytics Fellows Program Completion Report

In an effort to disseminate the results of IUB’s Student Learning Analytics Fellows Program, we would like to know how your learning analytics project has contributed to our understanding of student learning and success at Indiana University. As a first step, we plan to share your project results with the Indiana University community and the public through our Center for Innovative Teaching and Learning website. The purpose of this final report is to provide the Student Learning Analytics Fellows Program with a written record of grant-related activities, along with the accomplishments and challenges you may have faced during the grant term. We will use these reports to improve next years Student Learning Analytics Fellows Program and to document its effectiveness to the Office of the Vice Provost for Undergraduate Education, which underwrites the program.

Please complete this form electronically. Save the report as a Word document and submit it electronically to grehrey@indiana.edu. The report should be submitted no later November 18, 2016. The submission of a completion report using this template (or different pre-approved format) is required to receive any future funding from the Center for Innovative Teaching and Learning. Proposals to participate in future Student Learning Analytics Fellows Programs will not be considered until this report has been submitted.

Title of Study: Ethical Innovations: Exploring How Moral Reflection Benefits Learning Analytics Development

Principal Investigator Name and Department: James E. Willis, III, Ph.D., Research Associate, Center for Research on Learning and Technology, School of Education

Co-investigators Names and Departments: Joshua Quick, Graduate Student, Center for Research on Learning and Technology, School of Education

Year/Semester Awarded: Spring and Fall 2016 (completed in June 2016; see below for explanation)

How many undergraduate students were subjects in your study: n/a

How many graduate students were subjects in your study: n/a

Executive Summary: Please briefly describe the key findings of your study in one paragraph or less, similar to an abstract for a research article or conference presentation.

[Note: Data and observations for this study were conducted between February and June 2016. The full-time funding of PI Willis ended June 30, 2016, so observations and analysis were concluded early to provide a report of activities.]

Working alongside PI Daniel Hickey and his efforts to improve supplemental instruction, especially in mathematics courses, our efforts sought to locate, consider, and describe ethical principles of using student learning data. The emerging body of ethics in learning analytics literature often describes abstract or removed principles, but our method of observation purposely set out to work alongside PI Hickey as well as other Student
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Learning Analytics (SLA) Fellows. The ethical observations of this study were conducted in PI Hickey’s lab during spring 2016 and at several roundtable discussions of the SLA Fellows. The three major principles that emerged include communicating a researcher's identity and intentions, considering and disclosing financial concerns, and identifying contractual obligations present in student data.

Narrative: Please discuss the outcomes of your student learning analytics project and any plans you may have for continuing the work. When writing the narrative please consider the following questions.

Initial Findings
- To date, what were the most significant findings of your study?
- Did you have unexpected or unanticipated findings?
- What surprised you about the results?

To date, via observation and conversation in a learning lab and Student Learning Analytics (SLA) Fellows meetings, three principles and six sub-principles emerge that are important for ethical reflection in learning analytics (LA). Each are interrelated and emergent from observational concerns about ethical practices in LA. Contrary to abstract or detached ethical theory, these principles and sub-principles were designed at the “ground” level of observation, or within the applied ethics discipline. As such, we believe some of these are new to the growing body of ethical concerns in LA research:

1. Communicating a researcher’s identity and intentions
   1.1. The use of identity tokens in LMS systems presents new problems. For example, a PI may be assigned a token to access LMS data without being able to alter or redact the data. As researchers’ familiarity with data handling and computation becomes more prevalent, the use of ‘sandbox’ data becomes increasingly important; being able to experiment with data is important to the current (and foreseeable future) practices of LA. However, this token may be accessed, with permission, by fellow researchers, graduate students, or other authorized personnel also to utilize the ‘sandbox’ function. If there are questions as to the usage of the data, like if something is accidentally redacted or if the data is managed improperly, there is no clear tracking mechanism for token usage. Thus, if PIs are assigned tokens, and their associates lawfully access the data, the subsequent IT team(s) or those parties in charge of the data should be aware of the agents accessing the data, what activities are being undertaken, where the data results reside, and what care is being taken to safeguard the data.
   
   1.2. Researchers accessing their own course-level (and, thus, student-level) data do so under the auspices of their respective departments. However, as efforts to 'break down the silos of academe' increase, the potential for researchers to access, analyze, and curate data from other academic departments increases, especially in disciplines where data handling and computation skills are not readily available. This creates the potential for ethical conflict and asymmetrical influence of some departments over others. However, giving
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credence to the emerging interdisciplinary fields (like the so-called “digital humanities”) that use computational methods of inquiry, and may therefore be better equipped to deal with the amount of student data available to them, means the possibility of creating actionable data is more readily available. Likewise, it can be reasonably asserted that comfort with data handling and modeling will increase in all domains, so the possibility of using student data for actionable results will likewise increase. Though IRB rules would seemingly include disclosure to other academic disciplines, the central administrative units may bypass such rules under the guise of research, even when no harm is intended. Thus, it is important to discuss research activities and intentions with fellow departments or to disclose transparency efforts to other departments. When examining student-level data, especially in metrics like retention, course success (paired with co/pre-requisites), and course suggestion analytics, significant financial damage can be done to entire academic divisions, particularly as external (to the university) demands change curricular outcomes (e.g. workplace skill sets changing rapidly with technology). This has the potential to impact individual students as well as entire institutions. In short, course-level data has the power to give actionable data for student success, but it also has the power to create unforeseen problems as the dynamics of education, job-readiness, and economic pressures change rapidly.

2. Considering and disclosing financial concerns
   2.1. The cost of credit-hour may be a straightforward calculation, but the various student fees added to the total cost have an effect on student debt (which, in turn, has an effect on the political pressures of keeping a university education affordable). As the ubiquity of online education continues to permeate society, the costs of a residential, brick-and-mortar education will most likely become increasingly difficult to defend. The departmental justification for Supplemental Instruction, particularly in subjects where many students are inadequately prepared for university-level coursework, often involves adding student fees. Such monies, whether they are actually utilized or not, often are deposited directly into departmental ledgers. The incentive for providing Supplemental Instruction may rest more with cost-effective – not learning science demonstrated – measures. Ethically, then, the clear tracking of student fees, particularly as they are used in supplemental fashion, should be readily apparent. Failure to do so may well yield political consternation as residential education becomes harder to justify.

   2.2. When students enroll in a university, there are contractual obligations currently undergoing renegotiation even if they are not labelled as such. Specifically, universities now have access to troves of student data and many are using such data to increase student retention and success. In the present time, when students enroll at a university, can they reasonably expect, implicitly or explicitly, that their data will be used to help generate early warning systems, suggest alternative curricular routes, or provide a modicum of feedback about progress? While such agreements may not be legally contractual now, there is an implied ethical obligation when the
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university collects and analyzes data. Actionable information should be provided to the student, and not just for retention (i.e. tuition) monies. Many students may not consider the use of their own data to be a financial concern at present, but this may not be true in the near future: as with other services that provide convenience for the use of individual data (like social media), students may well consider a contractual obligation for use of their data and their tuition dollars.

3. Identifying contractual obligations present in student data
   3.1. Students today often enroll with college-level credits from other institutions. Whether traditional students who enroll with AP, IB, or community college credits, or non-traditional students who enroll with other undergraduate credits, having standardized systems to account for learning obtained are far from clear. Even with articulation agreements between local community colleges and universities, a degree-granting institution must accept, with some measure of trust, that the other institution(s) involved in awarding credit have done so with clear curricular outcomes and learning evidence. When research is conducted on the types and sequences of classes that lead to successful outcomes, oftentimes the pre-enrollment credits are not included because they cannot be standardized or aligned with the institution’s curricula. This may skew the data used to generate predictive results because it is not reflective of students’ experience.
   3.2. The relationship between students and their advisers is an important one. Notes generated by the adviser can play a pivotal role in LA as well as new data analysis methods like sentiment analysis. Currently, there are safeguards in place to protect the confidentiality of the student-advicee relationship, but there may be research questions that can be answered by analyzing this data. Additionally, the argument could be made that identifiers could be stripped from the data, yielding a valuable set of qualitative data. This may violate some of the contractual and privacy expectations students have with the institution.

Emerging from this research, unanticipated or surprising results include the fact that even though some of these particular ‘on-ground’ points do not yet exist in the literature, they are prescient concerns. The use of student data is only increasing, and while there are certain legal safeguards in place, research justified for the sake of retention will increase. What was surprising about this research is the sheer volume of questions it generates, along with the potential for further analysis and questioning.

While many researchers may think they simply know what is - and is not - ethical, what emerges from this research is not a lack of knowledge per se, but rather an assumption that what “is” ethical can be readily known from existing data. When engaging researchers in conversation about their data and the ethical uses of it, there can be an immediate defensiveness unless it is readily understood that ethics does not have to be oversight, but rather dialogue about practices that reflect the values of the intended research.
Reflection of the Process

• How well did the learning analytical data serve the needs of your research question(s)?
• In what ways, if any, did the study differ from your originally proposal?
• What methodological approaches and data did you use?
• What methodological challenges did you encounter in using student learning analytical data?
• What might you do differently the next time you work on a research project that uses student learning analytical data?

Methodologically, we employed an open dialogue with ‘on-ground’ LA development, including PI Hickey’s and the SLA Fellows’ research. This included questions and responses, as well as conceptualizing the deeper practices of data gathering, amalgamation, analysis, and output. The intended practice of observing ethical questions that simply could not be asked from a detached, conceptual understanding of LA proved quite beneficial. Instead, engaging other LA researchers in their practices yielded a plethora of follow-up questions. This involved discussing and plotting the various constituencies of affected parties, the implications of data use on entire networks of people, and the possible outcomes of LA and predictive modelling.

This project did not differ significantly from the original proposal, but that may be directly attributable to the fact that it was only conducted for half of the proposed time.

Future studies that address ethical issues may more directly employ data analysis as part and parcel with the research claims, not just attendant to the various observational concerns. For example, the claims in this study are interesting and useful on their face, but they may be more impactful to the more quantitatively minded audience if substantiated with specific, numerically-driven outcomes.

Connections to Field and Disseminating the Findings

• What curricular or classroom changes do you plan to make based upon the results of your study.
• What existing or emerging work does this study connect with?
• What plans do you have to further this work?
• How do you plan to disseminate the results?

Though it was hoped this research would be possible for the entire proposed duration, what emerged is the very real need to conduct similar analysis in future SLA projects. Having a team directly involved in the ethical questions of data use may help contribute to the body of ethics and LA research as well as LA research in itself. If this research may be picked up at a later date, it would be beneficial to flesh out specific qualitative and quantitative examples from the various projects and use them in a formal journal write-up.
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The researchers of this project would like to thank the SLA Fellows program and its funders for the opportunity to engage in the important work to examine the ethics of emerging LA projects.