

Engaging Teachers in Discussions Around Temporality Measures from Analytics to Inform Knowledge Building Discourse

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Abstract: This study examined the use of learning analytics designs to support teacher understanding of knowledge building discourse. In this study, learning analytics are designed to help teachers shift their focus on idea-centric knowledge building discourse, i.e. one that weigh students' questions and ideas on the potential for authentic inquiry and improvability. We present teachers' weekly meeting at which a group of teachers interpreted two sets of markers in students' online discussion using Knowledge Forum®. They are (i) keywords as content markers and (ii) Knowledge Building scaffold support as epistemic markers. We hope to inform the use of temporal measures of the learning analytics to surface invisible indicators to teachers that allowed them to understand students' discourse from the stance of improvability and reflect on how to improve the idea-centric discourse among students.

Introduction

This study is based on a series of research effort to develop a practical frame of 'learning analytics intervention' for teachers. This "Learning analytics intervention" for teachers -has been defined as the frame to guide teachers in the designing and enacting classroom activities and interaction with data from analytics tools, data, and reports (Wise, 2014; Wise & Chuy, 2011). There is huge potential in the use of learning analytics by teachers for professional development has not been well investigated and merit research attention.

In many Singapore classrooms, the spectrum of student-centred inquiry-based practice is so large that it is not surprising that many of the students do not get to experience important cognitive activities such as exploring dissonance; negotiating meaning; co-constructing learning. In many classroom discussions, we observed from the knowledge building project, promising questions and ideas that students raised in class is often "killed" before the class truly benefit from it. These promising ideas are either assessed as 'out of syllabus' or missed by the teacher having to navigate the many questions posted by students. In the long run, students may never get to develop adequate competencies to lead or navigate a productive and creative discourse in work-place. This study on using learning analytics to engage teacher in understanding the tenets of idea-centric discourse by making use of learning analytics to help teachers (i) identify discourse markers such as pivotal question or pivotal information and (ii) surface invisible indicators that are closely aligned to 21st century competencies (Chen & Resendes, 2014). This 'evidence' of learning would provide the confidence to teachers in moving their class towards improvable discourse.

Method

This poster describes the learning analytics designs based on Knowledge Forum work and a set of teacher discussion recording their interpretation of the different visualizations created by the analytics about their classroom practice. The intervention is to help teachers notice important but invisible indicators through examining the visualization of students' discourse recorded on Knowledge Forum. The three sets of visualisation generated by learning analytics that we think would serve to surface these important but invisible indicators are:

- (a) Content as learning markers: Three sets of keyword maps, each set provides a different level granularity of analysis to the teachers. The first is a composite visualisation of 2 related word-map (Fig. 1A) churned out by learning analytics. The green wordmap that display main keywords most frequently used by the students and a yellow word-map that provides a higher granulariry showing words are used by students even if it is only once. The visualisation includes the bold words and the text boxes are added in to allow teachers to read the details of the notes connected in the analytics. The other two are wordmaps of the keywords of the same topic from two other sources, the curriculum document and a corpus of scientific articles.
- (b) Pattern of centrality of keywords in the discourse, which we colloquially termed it as 'live of a word' in the online discussion database (Fig. 3). It provides teachers an overview of the kind of words collectively used by the students.
- (c) Epistemic markers: graph of different types of scaffold supports students adopted in their discourse.

- (d) Students' interaction: pattern of centrality of students and their ideas in the database, which we termed as "live of a student" in the online discourse database as indicator of students' contribution to the discourse.

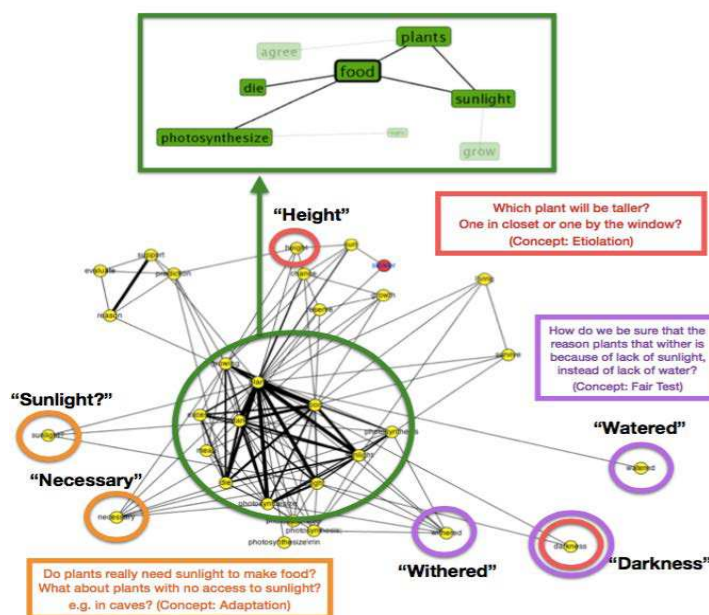


Figure 1. Two sets of related word-map generated from *students' discourse*.

Analysis and discussion

The team engaged in discussion around analysis every three months. This discussion was attended by 4 teachers including (teacher A) who conducted the lessons. The meeting lasted 1.5 hours. In these discussions, the teacher made sense of these data from learning analytics in relation to the 'seized' and 'missed' opportunities in their practice, in the following three areas:

- (i) Developing concepts and content: Do the keyword maps reveal to them students' ideas and questions that they did not notice in class? What do they see from the comparison across different sets of keyword maps?
- (ii) Competencies of scientific thinking and literacies: Anything that surprised the teachers in the way the analytics report to them how students think through and inquire about the problems?
- (iii) Class' dynamics: Anything about the students leading the conversation or the pattern of reading and be-read network that surprises them?

From the discourse, the visualization seemed to have supported the teachers in reflecting on the missed opportunity of not using some of the very interesting questions from his students when he saw the wordmap from his students' discourse. He also reflected on the lack of depth in the students' word-map when he compared it across the curriculum and of the scientific literature wordmaps, triangulated with the data from scaffold trackers. He shared that maybe he should have more time for the students to dwell deeper in their discussion. The teachers were pleasantly surprised with this visualization of the centrality measures of the concept and content words used by students. He agreed that these conceptual words may be more important than students just regurgitation content words. This indicates a possibility of translating the evidence of epistemic markers to influence teachers' practical moves.

References

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