REGENT'S UNIVERSITY LONDON

Regent's Working Papers 2019
Working Paper 1905: RWP1905

Transformative learning: Turnitin assessment text as a new data source for learning analytics.

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Abstract: Turnitin boasts "30 million" students across the globe. It has become the most popular writing technology deployed globally. Turnitin's artificial intelligence for writing assessment, a program called "adaptive technology," is now marketed as a cutting-edge product for assessing student writing. But is there a practical way for HE academics to access the student assessment data they freely contribute to this commercial model? This conference reflection article offers a potential contribution to answering that question. Retain student assessment data in institutional Qualitative Data Analysis Systems.

Keywords: Education; Learning Theories; Learner Analytics.

Profile:

Richard Meredith has wide-ranging professional expertise in management, organisational behaviour and human resources management. He is now an Early Career Researcher with an academic interest in three topic specialisms: (a) Management and human resources theories explaining the role of firms in social welfare, through an employer lens and in a social constructionist perspective; (b) Social construction of Higher Education student engagement, through a tutor-as-coach perspective; and (c) Employer engagement in Higher Education research and development projects.

Word count: 1,911.

Introduction

Is there a practical way to identify academic at-risk students before the start of term? Or is there no alternative but to look for in-class cues and formative assessment patterns or even wait to mark summative submissions after the term is over? This conference reflection essay offers a potential contribution to answering those questions. It suggests Turnitin assessment text data be make visible rather than remaining unseen, unnoticed, and therefore unactionable (Bienkowski et al., 2012). A poster presentation at the University of Greenwich Learning and Teaching festival 2019 became a transformative learning experience that led to Turnitin assessment data being conceived as a new data source for learning analytics, modelled using Activity Theory.

Poster presentation - Reflection

The poster presented at the Learning and Teaching Festival aimed to case study how one sessional worker adopted Qualitative Data Analysis (QDA) Software to manage the complexity and time pressure of high-volume assessment and marking. The Turnitin software is designed to facilitate a single set of marks and feedback per student script but doesn't currently include any features designed specifically to support document management of multiple marking teams, or assessment analysis across multiple students. In the case study, 150 student scripts were coded in the same way as in Turnitin. The main rationale for doing so was to easily consult written and oral briefings, assessment criteria, module handbooks and additional study guides, descriptors, and samples of marked work that add document complexity to the enterprise of marking. Accomplishing this activity smoothly is no mean feat, often in 10 rather than 15 days, irrespective of the assessment workload on any one individual.

The biproduct of assessment and marking outside the Turnitin system was that otherwise tacit knowledge of common assessment errors across a cohort of student was now captured for inductive thematic analysis and results available for a) summary feedback when marks are released; (b) narrative data for annual module reporting; (c) learning gain data for reflecting on future assessment and module design. This aspect was identified by several conference delegates as a learning analytic. My frame of reference to produce the conference poster was as a sessional worker coping with the process of marking. Looking back, these delegate comments were integral to self-reflection and learning; helping to shape my thinking that thematic analysis of assessment data on any module could conceivably be used for re-designing the learning environment for the following academic year. Mezirow (2000) suggested transformative learning only occurs when problematic frames of reference that fix assumptions and expectations are consciously unlearned. I had read about Mezirow Transformative Learning in a recent book Contemporary Theories of Learning (Illeris, 2018) and the delegates comments stimulated the metacognitive process of reassessing reasons. Mezirow (2003) considered an open mind and listen empathetically to others are necessary for reflective practice to occur.

The definition of Learning Analytics (LA) offered by Agudo-Peregrina et al., (2014) suggested that LA is analysis of electronic data to allow module designers and teachers the insight from the unobservable student learning process and learning context. Conceptually, the learning context can be profiled from registration characteristics (e.g. age/nationality/gender/disability/GPA/place of residence). This data can be supplemented through tracking student behaviours (VLE learning resources and activities; attendance; library resources; in-class participation) and data integrated to predict student individual learning needs in advance of formative and summative assessment and marking. Xing et al., (2015) produced a weekly forecast model that reported a 72% prediction accuracy. But is the assessment text added on-line to Turnitin by thousands of markers an untapped large set of educational data for reaching patterns or tendencies related to students?

Transformative Learning

> *"A frame of reference encompasses cognitive, conative, and emotional components, and is composed of two dimensions: habits of mind and a point of view." (Mezirow (1997:5)*

Having unfrozen (Lewin, 1943) from my frame of reference of a marking process, what new frame pertaining to student learning activities might I change to? Activity Theory (Engestrom, 1987) systemically examines the context in which learning occurs as well as the design process. The activity 'system' conceived by Engestrom is in Figure 1. The top half (shown as production), dynamically links the subject who performs an activity to the object of the activity and the tools that the subject uses in the activity. Below this triangle is the context – the division of labour associated with the activity within the community or organisation, who share a set of social meaning or rules for conducting such activities.

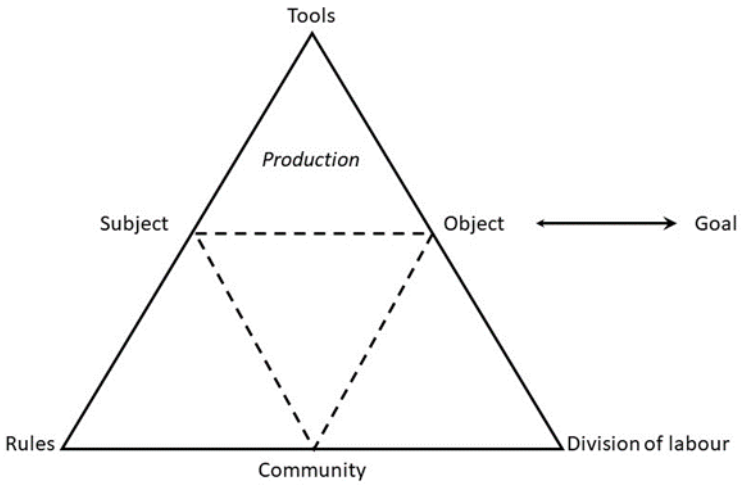

Figure 1: Activity Theory Model (Source: Engestrom, 1987)

Jonassen and Roner-Murphy (1999:62) argued that Activity Theory (Engestrom, 1987) provides a powerful conceptual framework for designing a learning environment because "it posits that conscious learning emerges from activity (performance), not a precursor to it". Xing et al., (2014) operationalised Activity Theory in a Computer-Supported Collaborative Learning computer environment to develop a student performance prediction model based on the 6 Activity Theory variables - Subject, Object, Tools, Division of Labour, Rules and Community. Jonassen and Roner-Murph relied on very different epistemic assumptions about the design of a student learning environment from traditional method which assume relevant knowledge to be embedded in the instruction for transfer to the learner in any context. They explicate the methods for creating a Constructive learning environment using Activity Theory.

The interpersonal dialogue at the conference about my poster led me to a new frame of reference. How about a theoretically grounded factorisation of three sets of data in order to both improve module design and adapt tutoring to individual student contexts? Namely the integration of: (a) historical assessment data, as a Community factor; (b) student categorical data, as a Subject factor; and (c) learning analytic data about in-class (audience participation tools) and on-line learning activities (VLE analytics), as an Activity Theory tool. Figure 2 models the structure of such an activity system, extending Engestrom (1999) through inclusion of Assessment Data in the Community component.

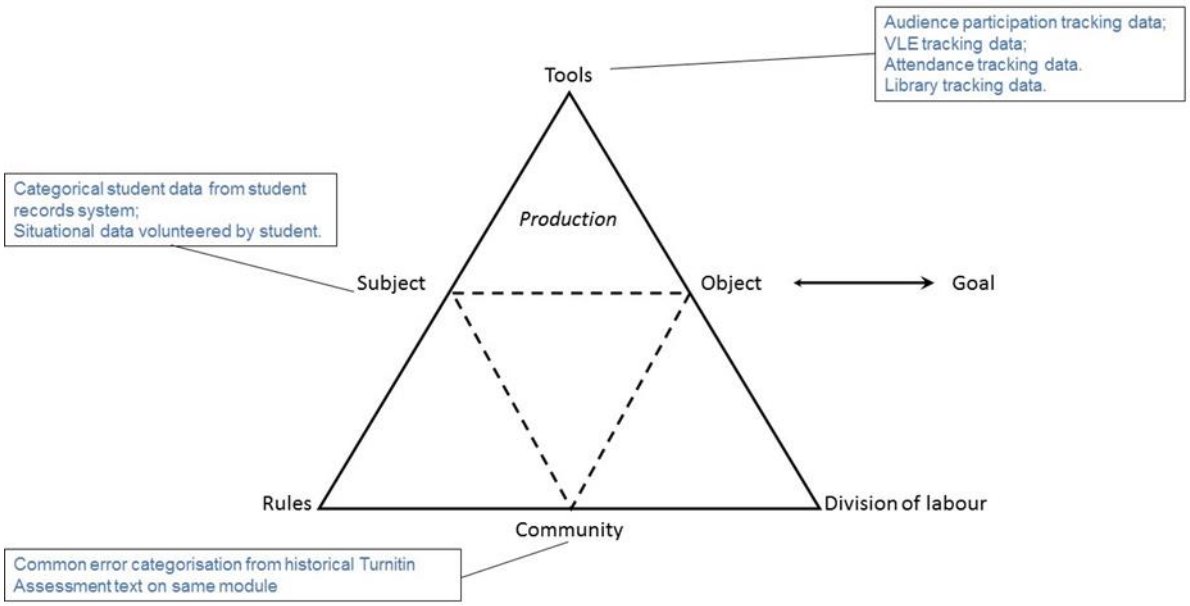

Figure 2 Profiling Turnitin data – an adaptation of Activity Theory Model. Source: Author derived from Engestrom (1987)

A description of activity theory operationalisation in order to make sense of historical Turnitin assessment data as a learning analytic is set out in Table 1.

Table 1: Student Performance Prediction Model Operationalisation of Activity Theory

Dimension	Definition
Production	Learning involves a subject student; the mental object of activity being learning; the learning resource tools such as the VLE that are used in the activity. As activity systems are conceived to be socially and contextually bound, the actions and operations that affect an outcome include the rules, community and division of labour.
Subject	Individual students who engage in the activity to achieve the object of learning.
Object	Completing learning tasks. Represents the intention that motivates the activity.
Tools	Computers, online tools, systems, and environments that mediate the learning activity.
Division of labour	Individual assignments within the overall activity, which is also mediated by rules and social negotiation.
Rules	Implicit and explicit rules and guidelines that constrain the activity. For example, Institutional Academic Rules of student behaviour and quality standards and specific rules set by Module Leaders for learning tasks (explicit). Individual student can only use the function residing in the supporting tools (implicit).
Community	The community of students at the same academic level who have previously completed the activity of learning. The customary areas of difficulty or errors in completion form the context of the activity in which it operates.

The activity theory factor called 'Community' in Figure 2 and Table 1 is perhaps contextually the most relevant to the design of a module. Jonassen and Roner-Murphy (1999) argued that traditional methods of task analysis focused only on the technical core of performance, ignoring the contexts within which learning occurs. Historical assessment text that identifies common themes and associated student categories offers the potential to yield a new source of rich context that is important when designing instruction.

Conclusion

Interest has increased in analytics as part of the solution to many issues in higher education (Baker and Yacef, 2009; Romero and Ventura, 2010). However, a practical way to identify academic at-risk students before the start of term appears to have eluded researchers so far. Mezirow (2000) believed that educational interventions are necessary to ensure that the learner acquires the understandings, skills, and dispositions essential for transformative learning. This article offers a model for Turnitin assessment text as a learning analytic based on transformative learning experiences at the University of Greenwich Learning and Teaching Festival 2019. I hope this reflective report demonstrates that the festival was an effective intervention.

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