

Chapter 12

Developing a Framework for the Visualisation of Learning Analytics in UK Higher Education

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ABSTRACT

Learning analytics has vast potential as a tool to further unlock the effectiveness of education in a digital age. The amount of data that can be gathered from varying access points can provide new insight and knowledge into how learners are interacting with course materials, learning systems and even fellow classmates. Research and experimentation is uncovering forms of best practice and possible factors on which to centre the analysis of students in an effective way, however learning analytics has yet to be comprehensively implemented country-wide in the United Kingdom.

The chapter explores the current impact of learning analytics in higher education at moment. This chapter also discusses and observes the current vacancies with which a framework enabled to function with data visualisation could be utilised. The eventual deliverable seeks to design an initial framework that has the potential to be utilised in a higher education setting for more effective and insightful decision making with regards to learner retention and engagement. This framework will combine the theory and scientific action of predictive analytics with a comparison of the most suitable data visualisation toolsets that are currently available in open-source software. The opportunity for further development and refinement of the framework, as well as the validity of deeper investigation into key concepts of data visualisation will also be elaborated on.

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INTRODUCTION

This purpose of this research project is to explore the current usage of learning analytics in UK higher education institutions. Furthermore, the project intends to offer the foundations of a viable learning analytic framework that could enable a deeper understanding of student engagement and retention. Examples of recently or previously implemented learning analytic function have been evaluated.

Background

This research looks to significantly build upon previous work conducted by the author in which the presence of learning analytics across the United Kingdom, United States and Australia. Previous research concluded that although learning analytic adoption is present in the United Kingdom and advancements are being made, the concept remains up and coming. Some of the absences discovered prompted further investigation into a way for learning analytic and predictive analytic practice could be further explored for the UK higher education environment.

This research document will firstly explore the current literature and landscape of learning analytics and predictive analytics whilst developing an understanding of how to define learner behaviour so that analytics can be effectively analysed.

Aims and Objectives

The overall aim is to propose the design of a framework within which learning analytics can be applied and used beneficially by UK higher education institutions to make meaningful predictions. The individual objectives assigned to achieve this aim are as follows:

- To learn and evaluate current learning analytic methodology and how it can be utilised in a UK higher education institution.
- To explore and understand the presence of big data and data analytics in the UK higher education sector at the time of conducting the research.
- To learn about and evaluate predictive analytic methodology and how it can be utilised in a UK higher education institution.
- To critically evaluate and compare open source data visualisation tools and assess any advantages that one has over another.
- To design and propose a framework that could combine learning analytics, predictive analytics and data visualisation for effective insight.

Scope

This research currently exists within the scope of the United Kingdom higher education landscape. In addition, the research and project will be developed with a specific focus on Edge Hill University. Within this scope, the research will be directed towards the Computing Department at Edge Hill University. The sample data used during the development of the framework theory will be taken from first year undergraduate students within the Computing Department. In further work and research, this framework could be expanded to cover different departments within Edge Hill University or even other higher education

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