AN IMPACT EVALUATION OF LEARNING ANALYTICS AT THE UNIVERSITY OF GLOUCESTERSHIRE:
A MIXED METHODS STUDY

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ABSTRACT

Background

Learning Analytics has become a widespread tool among higher education institutions over the last decade. The resulting data can be used by personal tutors to identify at risk students early and provide timely interventions by using that data as a basis for conversations in personal tutee meetings. At the University of Gloucestershire, Learning Analytics has been implemented since 2018 and that data is measured on assessment, attendance and virtual learning environment (VLE) usage.

Aim

To evaluate the use of Learning Analytics at the University of Gloucestershire in the post lockdown years following the end of the global Covid-19 restrictions in the UK from September 2021 onwards.

Methods

The research was carried out using a mixed methods approach drawing on both quantitative and qualitative data. Quantitative data consisted of a 10-item questionnaire sent to all academic staff and was responded to by (n=63) personal tutors, representative of 26 subject communities across the university.

The qualitative data was obtained through semi structured interviews with personal tutors (n=19) who had agreed to take part in a follow up interview. Data was triangulated by comparing the responses of those who took part in the interviews with their questionnaire data. The qualitative data was analysed using reflexive thematic analysis, following Braun and Clark's (2021) six phase framework for generating themes and codes. The quantitative data is presented as bar charts and line charts using the Questionnaire results and existing secondary data from the University of Gloucestershire and Jisc.

Findings

Findings suggest that that the use of Learning Analytics has been impacted by the global Covid-19 pandemic, particularly during the 2021-2022 academic year. The data further suggests that the use of Learning Analytics is a contributing factor to an overall

increase in student engagement post lockdown (2021 onwards). The data indicates that PTs are using Learning Analytics in a number of different ways. It also highlights that personal tutors are carrying out interventions for students on the basis of this data and that it appears to be one of the predominant ways in which Learning Analytics is being utilised.

Conclusion

The evaluation shows that staff and students are utilising Learning Analytics data and that it has moved from its initial implementation in 2018 to a successful 'business-as-usual' means to enhance the student experience. However, there are indications that it is not being used to its full potential due to technical issues raised with the Data Explorer dashboard. The data suggests that improvements could be made to University level policies and strategies. To sustain the use of Learning Analytics at University of Gloucestershire, it is argued that further support is needed for stakeholders, including training and awareness raising of the benefits of using Learning Analytics.

Declaration

I declare that the work in this thesis was carried out in accordance with the regulations of the University of Gloucestershire and is original except where indicated by specific reference in the text. No part of the thesis has been submitted as part of any other academic award. The thesis has not been presented to any other education institution in the United Kingdom or overseas. Any views expressed in the thesis are those of the author and in no way represent those of the University.

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CHAPTER ONE
INTRODUCTION

1.1 Learning Analytics

Since 2011, when the Society for Learning Analytics Research (SOLAR) launched the first Learning Analytics and Knowledge conference (LAK), Learning Analytics (LA) has become a widespread tool for Higher Education Institutions (HEIs) in the UK and internationally. The Society's members include academic researchers, practitioners and product developers. Part of SOLAR's mission to is create network opportunities for the LA community worldwide through events such as LAK and the Learning Analytics Summer Institute (LASI). Their aim is to also assist with new members embedding LA for the first time. SOLAR also have their own journal publication: The Journal of Learning Analytics which began in 2014. Although there are other organisations that are dedicated to assisting HEIs with LA adoption, (these include: Transforming Access and Student Outcomes in Higher Education (TASO) and Jisc, (a not for profit digital, data and technology agency supporting the HE sector), SOLAR was the first to present opportunities to create an LA community and showcase the definition of LA below.

LA can be defined as the "the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimising learning and the environments in which it occurs." (Siemens and Gašević, 2012, p1-2). LA data provides indicators that enable personal tutors to make timely interventions, for example in the areas of the virtual learning environment (VLE) engagement, assessment and attendance. Assessment refers to the assignments students submit, attendance is whether they have been physically present at seminars and lectures and engagement refers to interactions with the VLE resources on Moodle. At the UOG, students are assigned a personal tutor who provides guidance into all aspects of their university life. Attendance monitoring enables course teams to have to have a complete oversight of student engagement with their studies. It is a key part of LA and without it staff cannot gain a complete picture of student's engagement with their course.

The definition of student engagement for the UOG is presented in the Engagement and Attendance policy and this research focuses on the engagement with VLE usage. The

definition believes that student engagement refers to: “participation in guided independent or group study activities, assessment and feedback, and any other activities required,” (UOG, 2023, *Engagement and Attendance Policy*). The literature identifies that there are three categories under student engagement (Axelson and Flick, 2011): behavioural (the level of student commitment to study), cognitive (how they carry out their learning and whether they can be self-regulated) and emotional (their feelings towards the study) and also acknowledges that there are different definitions for student engagement (Millican et al, 2023).

Since 2012, there have been different models and cycles for LA. An early cycle is from Clow (2012) which intends to close the feedback loop for learners, to ensure any interventions reach the learner and prevent withdrawal. The loop consists of the following stages: learners, data, metrics and interventions. The first step in the Clow Learning Analytics cycle is learners. Learners refer to the students who are on the course, the second step is the “capture of data about or by the learners” (Clow, 2012, p134). In the third step, the metrics or analytics are used to inform on whether or not an intervention is required. The intervention is the final step and if an intervention is required, the tutor will contact the student to find out why they might need help. The UOG follows Clow’s process whereby an intervention is intended to produce feedback to help students who are at risk of disengaging to improve their outcomes.

Other cycles or frameworks include a five-step cycle from Campbell and Oblinger (2007) and the SHEILA framework (Tsai et al, 2018). The SHEILA framework is designed to help institutions with strategies and policies of Learning Analytics. SHEILA stands for ‘Supporting Higher Education to Integrate Learning Analytics’. The five steps of Campbell and Oblinger have been built on by Clow (2012) for his cycle and are: Capture, Report, Predict, Act, Refine. Step 4, ‘Act’ specifically refers to tutors making timely interventions to help students. The other steps involve capturing and reporting on the data and then using that data to predict outcomes.

Benefits of using the LA dashboard consist of the ability to view detailed graphs that give insight into students’ engagement of their course. In the system, student engagement is presented as the number of clicks on Moodle. This includes looking at resources or undertaking a quiz. Moodle is the University’s learning management system (LMS) and virtual learning environment (VLE). The VLE data allows the tutor to view the number of clicks the student has on Moodle as well as the ability to view which resources are most popular per module. Data Explorer also provides the ability to view attendance for all

students on the course, including those who might be difficult to reach (for example, those who do not respond to emails and are not attending classes). Staff can also view registers and make changes at any time once they are complete and can add students manually. On Moodle, staff can access the Data Explorer system, upload resources for modules and make any changes to modules. Students can use Moodle to upload assignments, view resources and view feedback reports from their tutors.

Criticisms of LA have included that LA tools “originate more from data availability than from the needs of students, teachers and decision makers” (Marquez et al, 2023, p1). This is a concern raised throughout the literature, where students and teachers are not consulted or do not participate in the development of LA (Guzmán-Valenzuela et al, 2021, De Quincy et al, 2016) and therefore they cannot contribute what their needs would be for LA tools. It would appear from all studies that this concern is recently relevant and still not resolved.

In relation to his Learning Analytics cycle (2012), Clow (2012) echoes concern about inaccurate data in a discussion of the Metrics step of his cycle: “all metrics carry a danger that the system will optimise for the metric, rather than what is actually valued” and goes on to advise that LA “should generate metrics that relate to what is valued in the learning process” (Clow, 2012, p137). A primary concern about the LA data (discussed in Chapter 5) is that the data is not accurately displaying what tutors know about the student.
Boulton et al (2019) describe further limitations of the use of LA that include the fact that: “these sources often cannot capture subjective aspects of student life, such as wellbeing and satisfaction, which are rarely routinely measured” (Boulton et al, 2019, p2). Since 2019, Wellbeing Analytics has become more prominent among universities and it is part of the next steps at UOG. The current aim for the UOG is to present Wellbeing Analytics as a unified case management system which would be accessible by all stakeholders who would need to view student cases (for example, chaplaincy and Student Helpzone advisors).

Boulton et al’s study aims to “understand how engagement and wellbeing vary over time” (Boulton et al, 2019, p3). A survey was sent out to obtain student opinions.
The findings showed that there is a decrease in engagement over the Spring term which encompasses both use of the systems and using the library/attending lectures. Boulton et al state that they “can only speculate why there is an observed decrease in engagement during the academic term” (Boulton et al, 2019, p17) and that it could be “because students like to get ahead at the start of term and work harder or engage more to do this” (Boulton et at, 2019, p 17).

The use of LA has also drawn criticisms from students regarding the accuracy of the data used by dashboards (Gray et al, 2022). The study presents the views of LA from important stakeholders including staff and students and uses focuses groups and surveys to obtain this data. The results of the student views showed that they expressed concerns that if their tutors do not upload resources to the VLE, then their VLE use will still appear as low in the system but it would represent an inaccurate picture. The inaccuracy causes concern as it would appear as though they are not engaged or attending lectures. It would be a particular concern for international students who need the attendance accurate to show it as proof for visa requirements. If attendance data is not accurate, students will be flagged for non-attendance and some could face University instigated withdrawal if it does not improve. Other reasons for low usage of the VLE might include students who download everything at once or practical courses who use it less to post resources, echoing the concern above.

A key consideration when undertaking this research was my role within the University as Learner Analytics Coordinator. The role involved carrying out staff training at workshops, responding to Helpdesk calls and collaboration with Jisc in resolving issues and more recently, attending workshops and providing UAT for the system upgrade. This provided many benefits including easy access to contacting staff for recruitment. This raises the issue of bias but by conducting the interviews I can uncover if the knowledge I have gained about how LA is used at the UOG is indeed the case or if there are differences.

Bias has been defined as “any trend or deviation from the truth in data collection, data analysis, interpretation and publication which can cause false conclusions” (Šimundić, 2013, p12). This can occur at any point during the study and as part of any research project and there are several different types. Types can include unconscious bias (where we are unaware and lack control of observations and decisions we are making) and outcome bias occurs when decisions are made based on the end result rather than at the time it was carried out.

1.1.2 Subfields of Learning Analytics

Wellbeing Analytics

In relation to Wellbeing Analytics, the following definition of LA can be applied and is a more recent definition than provided by Siemens in 2011. LA can provide systems

“that enable HEPs (Higher Education Providers) to identify students who have a heightened risk of developing poor mental wellbeing. This facilitates more proactive signposting or intervention before students’ needs become more serious” (Peck, 2023, p5). Wellbeing Analytics is acknowledged in the literature as an important part of academic outcomes (Boulton et al, 2019) and can be used to inform decisions the same way LA can about engagement. Their study found that they had positive reactions between engagement and happiness with negative reactions between engagement and academic outcomes, which was an unexpected finding.

Other universities who have done work on Wellbeing Analytics include Sheffield Hallam who produced a randomised controlled trial (RTC) evaluation into their interventions programme. The aim was to investigate whether providing students with an SMS and follow that by a phone call from SHU’s central team will increase student engagement scores among at-risk students. Their final report (Summers et al, 2024) that the engagement between academics and students did not increase as a result of the interventions and academics did not change their method of contact with students. However, the intervention did increase student knowledge on who to contact and what support was available to them. In terms of establishing an increase in student engagement, SHU state that it was difficult to determine whether the students followed up with the action given to them. This would suggest that following up with students is an extra step that could be added in further research.

1.2.1 Implementation of Learning Analytics at the UOG

At the beginning of the journey (in 2018), the University of Gloucestershire (UOG) was a pathfinder institution for the implementation of LA and worked closely with the University of Greenwich, University of South Wales, City University of London and the University of East Anglia. These universities were part of Jisc at the time of implementation. Jisc are a not for profit organisation supporting the HE sector. The UOG consists of four Schools: School of Education and Science, School of Creatives and Arts, School of Health and Social Care and School of Business, Computing and Social Sciences. The schools are spread out across three different campuses in Cheltenham and Gloucester. Data sources for the implementation stage of LA included Moodle engagement, attendance and assessment grades. Moodle is the University’s VLE where tutors post resources for students and those interactions are then recorded in Data Explorer for tutors to view. Data Explorer contains the LA as described above as well as allowing tutors to take attendance via an online register. LA has been implemented at the UOG since 2018 and is now considered a business

as usual approach. As part of the launch, the project was piloted into groups of tutors from the different schools (at this point, there were 7 schools rather than 4). Aims of using LA at the UOG initially included to provide valuable data to tutors so they can use it to make timely interventions. The data was provided through the use of Data Explorer and allows tutors to view student profiles. LA is used by students to check into lectures using the Study Goal web app via the use of a 4- digit code given to them by the tutor. Study Goal allows students to see their performance progress and their check-ins to lectures via data visualisations on the app.

The procedure for implementation of LA led to the creation of the UOG Engagement and Attendance Policy, the internal Attendance Monitoring site on the University's StaffNet and workshops for staff training as well as policies and information for students focusing on how to check into Study Goal and how the University will be using their data. The workshops included a demonstration for staff on how they would use Data Explorer and offered the opportunity for questions. The Engagement and Attendance policy (EA policy) outlines what LA is, how it is used by the University and information for students on what LA is and how their data is used while other pages include how to use Study Goal. It sits on the internal student information pages within IT. The EA policy refers to student engagement and student attendance and there is a difference between the two. Student engagement refers to how active students are within their courses including how they have been interacting with online resources while student attendance refers to whether they have actually come to their lecture/seminar and whether their presence is online or physical attendance.

Since 2018, LA has been used by staff to carry out Attendance monitoring using the LA Dashboard Data Explorer. The University is a key member of Jisc's Learning Analytics community and attends workshops and conferences with other Universities such as Newcastle University and Sheffield Hallam University. The way Data Explorer works is described in Chapter Four.

1.2.2 Impact Evaluation

An evaluation of the impact of LA on the academic staff and students who use it has not yet been carried out at the UOG although LA has been business as usual for six years. The two-year Covid pandemic has further allowed for a thorough evaluation considering the disruption it has caused to HEIs. This disruption includes lockdown and the move to online classes. The evaluation aims to uncover how the pandemic affected the use of LA. As discussed in Chapter Two, there are still a limited number of studies showing empirical

evidence for LA and this study aims to further close that gap through this evaluation. Empirical evidence refers to research that shows evidence for or against a proposal and this study will aim to collect data in support of whether the use of LA has improved student engagement.
Types of impact evaluation include summative and formative. Formative evaluation is completed during the process of implementation while a summative evaluation is performed by the end of the process. The goal of a summative evaluation is to assess whether a programme should end, continue or be adjusted while the goal of a formative evaluation is to enhance a programme. This evaluation is categorized as summative as it is being carried out after the implementation of LA and will assess whether that implementation has made a difference and achieved its original aims.

The research focuses on the impact on academic staff and will look at how they are using LA within their roles. There are various types of roles for academics that mean they use LA differently. Academic roles for staff include module tutor (MT) and personal tutor (PT). Module tutors use LA for taking attendance and PTs use LA data for the basis of conversations with students who might be at risk of disengaging. The impact on students will be examined using secondary data sources as it has not been possible to include any interviews with students for this research due to timescales. At the UOG, other stakeholders in the use of LA include administrators (from departments such as Academic Services), professional staff (from departments such as IT) and Immigration for concerns about international students. However, these stakeholders have not been used for this evaluation as they do not use LA on a frequent basis or in the same capacity as academic staff. These roles are intended to provide support to the academic staff who do use it more frequently.

There have been two key events in the last few years that have impacted the use of LA for staff and students. The first was the Covid -19 pandemic and the second is a staff restructure project called Reset. Much like many other HEIs, education moved to online during the pandemic years (2020-2022) with campuses closing down. This study will explore the impact the Covid pandemic has had on the use of LA and will be examined by analysing secondary data sources and interviewing academic staff who were affected about their experiences of online teaching. The secondary data sources will concentrate on post lockdown (2021 onwards) and will include examining student engagement over time to find differences between years.

During the academic year 2022-2023, the UOG faced further disruption in the form of a staff restructure project called Reset. Reset reduced seven schools to four and had

an impact on staffing which is ongoing and not yet complete. This posed difficulties such as a contact for escalation once new roles were announced as it removed a line of senior academic management.

1.4 Aims, Research Questions and Objectives

This study aims to evaluate the impact of LA on academic staff and students.

This thesis expands on the current gap of post pandemic research in relation to the use of LA and LA dashboards as it presents student engagement graphs and interactions during that time.

Research Questions

RQ 1: What are the benefits and challenges of using Data Explorer?
Given that the use of LA is business as usual (rather than in implementation stages), the following research questions were proposed for this study. From existing data in the Power Bi (PBI) reports, it was clear that although most departments had adopted using LA, not all of them did. Therefore, as part of this study, it was necessary to ask staff what challenges they were faced with when using the system in an effort to find out why it was not being used to its full potential. In addition, it was also necessary to discover what staff perceived as the benefits of using Data Explorer, if any at all.

RQ 2: How are personal tutors using LA in UOG undergraduate degrees?
Prior to a new interventions process in September 23, it was unclear how personal tutors carried out interventions and whether the LA data was being used for the correct purposes. The new process included recording the information in a university system. It was still unclear whether PTs used the LA data as a basis for conversations with students so this evaluation aims to explore if and how that data is used as per RO2.

RQ 3: Can the use of LA help with (re) establishing student engagement post lockdown (2021)?
The global pandemic of Covid -19 has issued its own challenges with all HEIs switching to online classes and closed campuses. RQ3 explores the use of LA tools and student engagement in post pandemic education, further decreasing a gap in the literature as most studies refer to issues and responses during the pandemic (Chapter Two).

Research Objectives

To answer the research questions, the following research objectives are proposed.

1. To carry out a review of the current technology using mixed methods (RQ1)

2. To analyse how personal tutors use the LA data and explore how they carry out interventions (RQ2)

3. To analyse student engagement over time using secondary data sources. (RQ3)

1.6 Theoretical frameworks

There are two main research paradigms that are adopted and used to guide researchers in selecting research methods. A paradigm has been defined as a "set of common beliefs and agreements that shares how problems should be understood and addressed" (Kuhn, cited in Brown, 2020). The two paradigms are positivism and interpretivism and each one contains the ontology, epistemology and methodology of the approach. Dawadi, Shrestha and Giri (2021) summarise the differences between ontology and epistemology: "Ontology is concerned with the nature of truth, i.e., what is the nature of reality? whereas epistemology refers to the nature and forms of human knowledge, i.e., how do we know what reality is" (Dawadi, Shrestha and Giri, 2021, p25-26).

LA is generally seen is a more quantitative approach that is associated with positivism and many studies carry out an empirical analysis (Worsley, 2018). However, this is not connected to quantitative research alone (Saqr, 2018) and qualitative methods can also be used for empirical LA research. LA is seen as a quantitative approach due to the numerical data present in LA dashboards and the type of data that it is measured by: Assessment, Attendance, VLE usage. Some universities also use library data but this is not currently being used by UOG as part of the Data Explorer dashboard. Library data informs which resources are being viewed and checked out for example books and electronic resource usage. This data can be used to track patterns and trends of student engagement.

Part of the data obtained for this study from the Data Explorer dashboard is purely numerical. Positivism is associated with quantitative methods and interpretivism is associated with qualitative methods. However, this study uses both qualitative and quantitative methods and therefore adopts mixed methods research (MMR), given that the

quantitative methods alone cannot answer the research questions. This is particularly true of RQ3 due to its limitations of not being used in the questionnaire (see Chapter 3). Bergin (2018) states that “these linkages are no longer fixed and some qualitative research has been expressly conducted in the positivist tradition” (Bergin, 2018, p19) and vice versa.

The main differences between the two methods are that quantitative research focuses on numerical data of an overall sample while qualitative focuses on the experiences of a population to gain knowledge of a phenomenon. By using the MMR approach in this impact evaluation, in depth views on LA can be gained through the semi structured interviews. The use of quantitative data can provide a validation to the information the qualitative data reveals, ensuring the robustness of the findings. Bergin also states that the use of mixed methods research is gaining popularity and mixing the methods “allows the researcher to benefit from the advantages both quantitative and qualitative methods offer.” (Bergin, 2018, p21).

The creation of a mixed methods approach was the result of much debate among researchers or a ‘paradigm war’ over whether quantitative and qualitative can be mixed. This debate particularly occurred during the 1990s (Guba and Lincoln, 1994) when researchers began to object to the idea of the incompatibility thesis (the view that the methods cannot be mixed).

The idea of mixed methods created a new paradigm which is known as pragmatism (starting initially with Charles Sanders Peirce, 1870) and which is not associated with either of the other two paradigms mentioned (positivism and interpretivism). Instead it uses a combination of methods and “ends the paradigm war by suggesting that the most important question is whether the research has helped to find out what the researcher wants to know” (Dawadi, Shrestha and Giri, 2021, p26). Pragmatism will be used as the framework for this study as it is appropriate for mixed methods. Other paradigms for mixed methods have included Critical Realism, transformative and dialectical.

1.7 Structure

This thesis contains six chapters. Chapter 2 describes the relevant literature which includes topics such as the role of the personal tutor and a review of mixed methods research. In Chapter 3, the methods are discussed and divided into quantitative and qualitative. This includes the questionnaire for quantitative data, semi-structured interviews for qualitative data and the use of triangulation to merge the two. Chapter 4 presents the

results of secondary data used to analyse student engagement and attendance over time. Chapter 5 presents the findings of the interview (thematic analysis). After each set of findings, there is a discussion for each question. Chapter Six presents the findings of the questionnaire and is in the same format as Chapter 5 for the discussions. Chapter 7 centres on the conclusion. The conclusion includes the limitations of the study and further research.

The following chapter presents the literature review. The current literature focuses on studies during the pandemic and how this affected LA and online learning, the use of dashboards including any new developments for these and factors affecting student engagement.

CHAPTER TWO
LITERATURE REVIEW

Introduction

Learning Analytics (LA) is a growing field that has been used widely by HEIs since 2011 and its adoption and implementation has become a key topic of interest within the literature. Marquez et al's (2023) systematic literature review presents various factors associated with the adoption of LA. The total number of factors identified was 14 and include project management methodology, stability of current technology, resources and staffing. The most critical factors identified in the context of LA adoption were: user support, communications with users, end user training and standard for LA software. The process was carried out in three stages and resulted in identifying 324 articles. The three stages were based on the following areas of the articles: titles and abstracts, the introduction and conclusion and the full text. Challenges in relation to the adoption of LA are discussed in subsection 2.3. This review will focus less on adoption given that the UOG is utilising LA as a business as usual approach.

As of 2018, UOG is part of a wider community within Jisc which contains several other Universities who all use the same analytics but in slightly different ways but all use the Learning Analytics dashboard (LAD) Data Explorer. For example, Leeds Trinity do not use Data Explorer for Attendance. Other Universities who use the Data Explorer dashboard for its full use include the UOG, Sheffield Hallam and Newcastle University. The UOG has adopted the use of the Data Explorer dashboard to record and run attendance registers and present users with data visualisations to track student engagement and attendance over time.

In this chapter, current literature will be discussed under the below topics. Sections covered include Learning Analytics (LA) dashboards, the role of the personal tutor, the impact of LA post lockdown, the use of mixed methods and the challenges that are involved in using LA.

2.1 Learning Analytics in Higher Education

An aim of Learning Analytics (LA) is to improve the outcomes of teaching and learning. In the last decade, systematic literature reviews have been conducted that present case studies on how LA functions within Higher Education (HE) and some reviews focus on the benefits and challenges of using Learning Analytics Dashboards (LADs). Most reviews focus on implementation and exploring whether LA can achieve its aim of improving student outcomes (Ferguson and Clow, 2017). They have also examined the methods and approaches used to carry out LA studies (Viberg et al, 2018). The use of LA has also been presented in the form of case studies per University as below (Sclater, Peasgood and Mullan, 2016).

In an early report developed by (Sclater, Peasgood and Mullan, 2016) a total of 11 case studies are presented as a review of practice at the time. At this stage, the Universities were in the early stages of implementation. The following Universities are covered as some of the first in the world to be using LA: Purdue University (US) and Nottingham Trent (UK). The report identifies a number of benefits of the use of LA based on the case studies which include: Improving the quality of teaching, increasing retention and giving students the chance to take control of their own learning. A key part of the case studies highlights the use and value of dashboards “for enhancing teaching or future course provision” (Sclater, Peasgood and Mullan, 2016, p8). Further examples of this include the University of Maryland (US) where it was discovered that an improved student performance in one course could lead to improved performances in other courses.

The report highlights a further use for LA as they state that once tutors have reviewed a student’s engagement, they can also “adapt their teaching if, for example, they identify that students are struggling with a particular topic” (Sclater, Peasgood and Mullan, 2016, p8). This could lead to a redesign of modules if there are particular modules that students avoid because they don’t like them.

Similar systems to that of Data Explorer have been evaluated and include Learning Tracker (Davis et al, 2016) and Student Explorer (Krumm et al, 2014). Student Explorer is similar to Data Explorer as in it is an early warning system that provides student data for advisors. As with Data Explorer, Student Explorer tracks student progress and uses data to identify students who are at risk and will require an intervention. Another trait similar to Data Explorer is the use of a traffic light system to assign the students with a status and therefore prompt the advisor or tutor to view that student’s data. In the case of Student Explorer, it records the colours and statuses as Engage (red), Explore (yellow) and Encourage (green). The study was conducted in two phases (Phase I and Phase II) and it was found that

advisors used Student Explorer more frequently in Phase II after changes were made based on their feedback.

In the study by Davis et al (2016), a randomised control trial (RCT) was used to evaluate the Learning Tracker widget with both a test group and a control group. It presents students with the ability to compare their engagement with those students who have been successful in passing their courses using data visualisations. This is similar to the Data Explorer system as it offers tutors the ability to see how students compare against each other with various options including Attendance percentage (the desired percentage is 80). It was concluded that the widget did "significantly increase learner success (in terms of final grade)" (Davis et al, 2016, p5). Data Explorer has a similar idea in terms of providing feedback to students whereby the data can be used to show students their level of engagement and ideally increase their motivation and success. Davis et al's study is significant as it shows support for LA making a difference to student outcomes and is one of the few to do so.

As stated, another aspect of LA in HE that has been examined is that of the research approaches and methods used to carry out the studies. Viberg et al (2018) identified several research approaches for their systematic review. These included descriptive and theoretical approaches and it was found that descriptive is the most widely deployed and particularly pertains to studies that have examined LA tools such as dashboards. A further category that has been explored within the review is methods of data collection. The different methods identified include interpretive study, literature review and experiments. Interpretive was the most popular and is the method employed for this study. Studies that used a mixed methods approach were also analysed but only 19% of papers used them, indicating that mixed methods is still an approach not widely used. This study addresses this by adopting the mixed methods approach in the context of LA. A key finding from the review was that there is little evidence that LA has improved learner outcomes, suggesting further empirical studies are needed to prove this as well as more research needed for the area of interventions (Wong and Cheong Li, 2019).

2.2 Learning Analytics Dashboards/Tools

In the last decade, LA dashboards and tools have enabled course teams to monitor student engagement and assist tutors with deciding whether students require an intervention. Studies have identified that there are several types of dashboards aimed at the following groups: teachers only, teachers and students and students only (Park and Jo, 2015). Data

Explorer is for tutors to analyse student data and Study Goal is for students so both are catered for on different platforms.

Interventions can be used for: “improving undesirable situations such as a dropping retention rate or an unsatisfactory pass rate, which are informed by data on the learning progress of students.” (Wong and Cheong Li, 2019, p8). Wong and Cheong provide a review of interventions in LA from 2011 to 2018 and the overview contains 24 case studies including the following countries: Australia, Spain, Hong Kong, Taiwan and USA (where the majority of the cases are from). The review was grouped into: the objective of the intervention, the types of data and the method used, the outcomes of the interventions and any challenges that were faced. The findings from the case studies indicated that the type of data with the highest frequency was student behaviour for online learning and the intervention method used was a personalised recommendation. For some case studies, the outcomes of the interventions revealed that higher retention rates were produced after they had been carried out as well as an improvement in study performance (for example a 40% decrease in retention for Smith, 2012). The challenges faced included that there was difficulty in reaching some students who had been classified as at risk. The conclusions found that “learning analytics interventions have enabled students’ learning to be enhanced, their problems to be identified early and timely personalised support to be offered” (Wong and Cheong, 2019, p16). This is the aim of the Data Explorer dashboard as it can provide tutors with data visualisations for every student within their own Student Overview (Figure 2). An objective of this study is to find out how the interventions are carried out at the UOG as part of research question (RQ) 2.

There are different types of analytics that can be applied to Learning Analytics dashboards which are predictive and descriptive analytics. Predictive analytics assess what might happen in the future. Descriptive analytics is more widely used but developments are advancing to include predictive analytics within dashboards (Susnjak, Ramaswami, and Mathrani, 2022). Descriptive analytics provides tutors with information on their student’s progress over time and whether their engagement and attendance is low. These analytics are presented through data visualisation with the ability to go backwards and forwards across the year to find trends and patterns in the data. Data Explorer currently uses only descriptive analytics, as in it informs tutors on how students have previously been engaging rather than determining what could happen in the future. LA is measured on VLE usage, Attendance and Assessment, which is recorded in Data Explorer.

Susnjak, Ramaswami, and Mathrani, (2022) have reviewed existing LADs and have also proposed their own dashboard which contains both predictive and descriptive analytics. Their “proposed dashboard is the first of its kind in terms of breadth of analytics that it integrates, and is currently deployed for trials at a higher education institution” (Susnjak, Ramaswami and Mathrani, 2022, p1). Their new dashboard incorporates both descriptive analytics, predictive analytics and prescriptive analytics. It was found that all studies used descriptive analytics and each dashboard contained similar characteristics and visualisations to that of Data Explorer such as interactions with online resources and comparing the student to the class average but some have also advanced to include predictive analytics in their dashboards (Valle et al, 2021).

In an early case study highlighted by Sclater, Peasgood and Mullan (2016), Purdue University (US) presented Signals which is a similar Attendance system to that of Data Explorer (used by the Jisc community). Signals shows that “problems are identified as early as the second week in the semester, something which simply was not possible before” (Sclater, Peasgood and Mullan, 2016, p8) It is based on similar data sources to those included in Data Explorer, such as Attendance but also includes characteristics.

The third research question (RQ3) debates whether LA has the potential to re-establish student engagement in post pandemic education (2021 onwards). Few studies exist that highlight the use of LA and LA dashboards post pandemic. Studies focus on the impact of online education, factors that affect student engagement and the use of LA during the pandemic (Celik et al, (2023).

Celik et al (2023) highlights the current gap: “For future research, the impact of implementing LA tools in post-pandemic education as supporting teacher and student engagement, fluency of institutional practices and student learning should be explored” (Cellik et al, 2023, p399). This study focuses on the use of LA tools in post pandemic education, examines dates from that time starting with 2021 and concentrates on how it was used as a business as usual (business as usual) approach.

Limitations of using LADs include that they can’t provide reasons behind the patterns identified by the data (Paolucci et al, 2024). This would be where the tutor’s knowledge of the student would help to identify why certain patterns would exist. While Paolucci’s review of challenges and opportunities of using LA is in a Pre-Kindergarten through grade 12 (PK-12) setting, these limitations have been applied to LADs in higher education including Data Explorer. A key challenge raised that can be applied is concern

over a lack of empirical evidence showing that LA has improved teaching and learning outcomes (also raised by Viberg et al back in 2018) suggesting that this is still a current concern. Foster and Francis (2020) echo this but acknowledge that there are studies that have produced evidence that does say otherwise. Gasevic and Tsai, (2017) also identified this as a challenge within LA, as discussed in the below section.

2.3 Challenges and experiences of using LA

A significant aspect of using LA that has been identified in multiple papers is the challenges it brings to higher education institutions (HEIs). This has included challenges relating to implementation and the use of LA as stated by previous research (Gasevic and Tsai, 2017, and Alzahrani et al, 2023). Challenges include factors such as technical and ethical considerations for example the use of personal student data and consent tend to be predominantly related to adoption of LA.

Ethics

Ethical and privacy issues are consistently recognised by the literature as a key challenge of working with LA. Privacy issues arise around sharing the data with third parties and other Universities. Permission is sought from Data Protection at the UOG if there is a need to share any data with other universities and there is also a Data Sharing agreement with Jisc. Ethical considerations for this study are outlined in Chapter 3. Slade and Prinsloo (2013) present an ethical framework for Learning Analytics in higher education. They describe several principles that can be used by intuitions as a guide which includes: Learning Analytics as Moral Practice, Students as Agents, Student Identity and Performance, Student Success, Transparency and Higher Education Cannot Afford to Not Use Data.

LA policy

Gasevic and Tsai's research presents the results of a review of eight policies for learning analytics of relevance for higher education, and discusses how these policies have tried to address prominent challenges in the adoption of learning analytics." (Gasevic and Tsai, 2017, p1). There are a total of six challenges that have been identified and these include: "a shortage of leadership, infrequent institutional examples of equal engagement with different stakeholders at various levels and a limited number of studies empirically validating the impact of analytics-triggered interventions." (Gasevic and Tsai, 2017, p4).

They highlight that (in 2017) there is a current total of 23 empirical studies. The objective of the review was to “highlight areas policy makers can consider when up-dating an existing policy or developing a new policy for learning analytics” (Gasevic and Tsai, 2017, p10). The paper goes on to highlight whether the policies address the challenges presented above. The review concludes that although some universities have implemented policies, not all have addressed the need for guidelines in relation to Learning Analytics. It was found that the challenge that is the most limited is that of providing evidence as to how effective LA has been as only one university in the study (USyd: The University of Sydney) mentions this in their policies.

To combat these types of challenges, the UOG has implemented policies since LA adoption (see Introduction) and is updating them when a change has taken place. In particular the Engagement and Attendance policy (EA policy) outlines who is responsible for which part of LA and provides step by step details of interventions and the University instigated withdrawal procedure (which was updated due to the recent staff restructure). To ensure the UOG interacts with stakeholders at all levels, training sessions are put in place where the EA policy is referred to, ensuring all receive the messages. The training sessions include new staff and existing staff at each level. This thesis is the first step into evaluating the effectiveness of LA at the UOG as it presents additional challenges and benefits of using LA and so far, has not been included in any UOG policies.

LA adoption

Alzahrani et al (2023) aimed to untangle the challenges faced by HEIs in their adoption of LA. The paper reviews institutional practice in three categories in LA adoption: Full, partial and not adopted. Their study acknowledges that “challenges in LA adoption are essentially rooted in areas including technical factors, human factors, and organizational factors.” Alzahrani et al (2023, p4565). The study categorizes challenges under several themes: ethics, leadership, analytics culture, analytics capabilities, stakeholders’ involvement and technology. The UOG would come under the category of full adoption and has experienced the factors mentioned above in relation to LA adoption. The themes are also considerations undertaken by the UOG with analytics culture, analytics capabilities, stakeholders’ involvement and technology being the most relevant due to LA running as business as usual while the first two would pertain more towards implementation. Their findings state that each theme is connected to several challenges and the challenges that showed the most connections to different factors were stakeholder buy-in, ethics and

privacy and resources. Examples of the different factors included interactions with external stakeholders from LA providers such as Jisc (who the UOG was partnered with). It was suggested that these three affect multiple areas of LA and should be key considerations for senior managers among HEIs when adopting LA. The paper goes on to advise senior managers on recommendations for LA adoption.

2.4 Role of the Personal tutor

The role of the personal tutor (PT) is intended to help support and guide students in all aspects of their University life. Aspects of the PT role that were analysed for this study include whether they use LA data to support students in meetings with personal tutees and how the interventions are carried out. It would appear that the literature focuses on the role of the PT in terms of the relationship with the student and vice versa, rather than in the context of the use of LA.

Studies have been conducted into the role of the personal tutor (Wakelin, 2021, Seraj and Leggett, 2023) and its effectiveness (Lochtie et al, 2018). The approach to personal tutoring differs among universities (Tryfona et al, 2013). Tryfona et al's study explains the differences between the two approaches at Cardiff and Bristol universities. Cardiff School of Management has a Personal Tutoring team that is made up of 5 academic staff while Bristol's Queen's University is more similar to UOG in that it involves all academic staff who are each assigned a group of students (normally groups of six). At the UOG, PTs can have as many as 20 (or more) students assigned to them.

Through the use of questionnaires, Wakelin (2021) analyses the personal tutoring system at the Nottingham Law School (NLS). The study explores the role of the personal tutor and states that "the personal tutor has a key role to play in a student's time at university, beyond simply the development of academic skills" (Wakelin, 2021). The study participants are both staff and students with both groups agreeing that the personal tutor role was important, that they see the personal tutor as the first point of contact and that the purpose of the role was to provide support and guidance. However, staff responses "also highlighted that the additional pressures that are being placed on personal tutors to deal with increasingly complex needs, without the necessary training." (Wakelin, 2021, p1007). The additional pressures included boundaries and student expectations in relation to areas such as counselling leading some to show a lack of confidence in carrying out the role. This study does not set out to improve the PT role but to explore how the role uses LA. Wakelin's recommendations for future research state that more can be done with student engagement (in relation to personal tutoring) and an objective for this study is to explore how PTs use

student engagement data in their tutee meetings, with emphasis on how it is used for interventions. The findings of this are discussed in Chapters Five and Six.

At the UOG, there is a Personal Tutor Scheme (PTS) and each student is assigned a personal tutor who supports them with all aspects of their university life. Data from the LAD, Data Explorer, will show them which students need support and allow them to view data as a whole cohort or individually on a per module basis. Data Explorer can show them via a Red Amber or Green (RAG) rating whether that student is falling behind and how frequently they are engaging with their course.

In September 2023 at the UOG, changes were made to the interventions process where another team would identify students who are falling behind and they would then be flagged to their personal tutor. PTs still view the data in Data Explorer to view students' engagement.

In an engagement study conducted at the UOG on a small scale, Millican et al address that concerns they have as personal tutors are "about attendance and the impact of absenteeism" (Millican et al, 2023, p31). The objective of the study was to "to deepen understandings of engagement and attendance and to explore influences on both in the hope of unearthing ways to improve both" (Millican et al, 2023, p31). Millican et al explore the factors that can influence engagement through the use of student questionnaires and interviews. A further objective of this study is to look at secondary data sources over time to analyse the impact LA has had on engagement and attendance. In this study, factors influencing engagement have been explored in the tutor interviews (many of whom were personal tutors) to understand why it might be low at certain points of the year with particular focus on post-Covid years. The factors found by Millican et al were a mixture of issues facing the students personally (internal) as well as any issues they had with the University and their tutors (external). These factors are further discussed in subsection 2.5.

Lochtie et al (2018) cover how effective the role of the personal tutor is. The book presents key topics in relation to tutoring including definitions, coaching, core values and skills, boundaries, monitoring students, undertaking group and individual tutorials and the need to measure impact. They believe that measuring impact needs to focus on change and also requires a comparison over time, which is what this study sets out to do in relation to student engagement and attendance data (from 2021 onwards through the analysis of secondary data). Chapter 8 focuses on measuring impact and advises personal tutors on what can be measured and the methods that can be used in practice: for example using ranking questions in questionnaires and student focus groups.

2.5 Factors affecting student engagement post lockdown (2021)

Student engagement has been defined as “the quality of effort students themselves devote to educationally purposeful activities that contribute directly to desired outcomes” (Hu and Kuh, 2001, p3). Previous research highlights that there are many factors that can affect student engagement (Millican et al, 2023) and that these can be both internal (personal to the student) and external (factors associated with the University such as tutors, peers and classes). Engagement can also refer to any further activities associated with the course. Attendance is a further concept linked with engagement but means whether students are physically present or not in their classes and this is monitored throughout the University. The Data Explorer system allows for monitoring, using the student learning data to see whether students are engaging or require an intervention.

During 2020 to 2021 many HEIs had moved to online teaching only and face to face classes were suspended. Factors affecting student engagement during this time include attitudes to online learning and missing physical contact with others as reported by Hendrick, Opdenakker and Van de Vaart (2023). These interactions would include meeting with each other on campus and being able to meet with tutors face to face. From 2021-2022, a hybrid teaching period was adopted as lockdown restrictions slowly ceased. Post lockdown factors included mental health and wellbeing. Although this was a concern pre-pandemic, it was heightened due to the restrictions put in place such as social distancing (keeping two meters apart from others). Hendrick, Opdenakker and Van de Vaart (2023) aimed to “investigate the effects of the prolonged lockdown on students’ academic engagement and to explore the factors that are expected to influence these effects” (Hendrick, Opdenakker and Van de Vaart, p3, 2023). The study found that factors such as loneliness impacted academic engagement negatively and this was an expected finding.

Many studies have focused on the use of LA during the pandemic and there was also a growing field of interest in the responses of the institutions (Khalil, Prinsloo, and Slade, 2021) who provide empirical evidence of how LA has been used during the 2020-2021 academic year. One example of this that they cite is that of Zhang, Taub and Chen (2021) who used click-stream data from student interactions within an online physics course and aims to measure the impact Covid-19 has had on student engagement. Their results showed that students were still successful in completing their online assignments (despite the restrictions) and the authors suggest that perhaps this was due to the flexibility of that environment. The results for Overall Engagement also indicated that there was no significant

difference to student interaction during the pandemic time with access to modules remaining between 85% and 100%. The evidence here would suggest that in this case the pandemic did not affect student success or completion of tasks. This study uses similar data from students to identify where problems lie and what impact the pandemic had on student engagement during 2021-2022.

Developments that have been heightened as a result of the pandemic include Wellbeing Analytics. Wellbeing Analytics is currently in the early stages of development at the UOG and is a new subfield of LA. The Quality Assurance Agency (QAA) presents a report on student engagement and how it was affected by the pandemic. The QAA is an independent charity which provides support to the HE sector and collaborates with universities. Students have expressed a wish for help with mental health and wellbeing: “for example in the form of individual counselling or check-ins, to keep abreast with stresses caused by an increasingly fast paced learning environment” (Hulene et al, 2023, p18).

Another key factor affecting student engagement is the time it takes to travel to campus for commuting students. The 2023 report for QAA, (which is made up of a collaboration of ten UK Universities including Coventry University) presents the experiences and challenges faced by students post pandemic. The report states that the findings include the following themes: “timetabling and commuting students, the need for physical and virtual communities, the importance of recordings for flexible learning, digital literacy and inequalities, and the need to do more to mobilise student voices” (Hulene et al, 2023, p2). In relation to commuting students, the report summarises that there a number of issues for HEIs to address as “there is a growing demand that the campus environment is accommodating” (Hulene et al, 2023, p10). Overall the students interviewed for this report “did not feel that they had what they described as a ‘typical’ or ‘normal’ student experience during the pandemic” (Hulene et al, 2023, p17).

2.6. The use of Mixed Methods in Learning Analytics

As noted by previous research, there are few studies that use mixed methods within the field of LA (Shin, Song and Hong, 2022, Worsley, 2018). This is reinforced by Chaparro Amaya, Restrepo-Calle & Ramírez-Echeverry’s 2023 literature review where they found that “the inclusion of qualitative analysis is an emerging area with limited research” (Chaparro Amaya, Restrepo-Calle & Ramírez-Echeverry ,2023, p343). The limitations of using quantitative data alone is further highlighted by Naujokaitienė et al (2020) stating that “it should be noted that LA driven research is mostly based on quantitative data analysis which may disclose neither

the specific experience of teachers nor the factors that influence learning design." (Naujokaitienė et al, 2020, p232). To avoid the limitation of pure quantitative methods in this study, a mixed methods approach was decided in order to find out more specific details from the participants through semi structured interview, particularly the experience of tutors.

Recent studies include Nguyen, Reinties and Whitelock (2020), Hilliger et al (2020) and Song, Shin and Hong (2022). Nguyen, Reinties and Whitelock (2020) used a combination of network analysis with semi structured interviews and Hiliger et al (2020)'s methods used were surveys for quantitative data and focus groups and interviews for the qualitative data.

Song, Shin and Hong's study discusses how LA can be integrated into a mixed methods research approach. It also discusses reasons for mixing methods and provides previous studies that have carried out integration using LA (Kwong et al, 2017). Kwong et al also use triangulation as their form of integration. Song, Shin and Hong's study suggests that "the integration of LA and mixed methods research can provide the basis for developing a better understanding of learning patterns and behaviours" (Song, Shin and Hong, 2022, p290). The learning patterns will come from the data obtained through the LA dashboard and can be identified through bar charts.

The study from Hilliger et al (2020) describes the challenges faced by Latin America universities in using LA. These challenges are similar to those experienced by the UOG and other universities. The challenges included a lack of expertise and knowledge of the field as institutions did not have staff who had knowledge of data analysis or who had the skills to interpret the analytics. The findings "give an overview of the current use of educational data, besides revealing opportunities and challenges towards future LA adoption" (Hilliger et al, 2020, p918).

A further study by Plano Clark, Walton and Foote (2022) reviews mixed methods studies in the capacity of a mixed methods case study which has emerged as a new approach but one that is becoming more prominent. They review the advantages and disadvantages for researchers using this approach where they state one of the challenges of integration is where the issue for "researchers using a mixed methods case study is to realise the full potential of both qualitative and quantitative data through the application of mixed methods integration while fully engaging in case-based examination" (Plano Clark, Walton and Foote, 2022, p216). In this case study both quantitative and qualitative data have been analysed to provide a full picture of the research questions (see Chapter Five and Six).

Since 2022, further mixed methods research studies have been carried out in relation to LA in the fields of Computer programming (Chaparro Amaya, Restrepo-Calle & Ramírez-Echeverry, (2023). Their study presents a similar framework to this study as it contains the following phases: “1). quantitative data, 2) qualitative data and 3) integration and discussion” (Chaparro Amaya, Restrepo-Calle & Ramírez-Echeverry, 2023, p343.). They outline that one of the challenges that remains with using LA comes from “an over reliance on quantitative methods, as opposed to qualitative or mixed methods” (Chaparro Amaya, Restrepo-Calle & Ramírez-Echeverry, 2023, p343). This suggests that although advances have been made in using mixed methods as an approach, there is still limited research on using it in the context of LA with quantitative data still being the dominant approach.

Summary

In this chapter, the current literature pertaining to LA has been discussed and highlights how the field of LA has grown since 2011. Topics covered have included the role of the personal tutor and how this fits into the use of LA, factors of student engagement and the benefits of LA dashboards. The literature review has identified the following gaps that have led to this study being carried out.

Key observations from the literature include that there is still a lack of studies showing empirical evidence for LA. This study aims to provide this evidence by showing the impact that LA has had on student engagement. This is a gap that has been identified as far back as 2017 but also in more recent times (Foster and Francis, 2020).

Studies have discussed the role of the Personal tutor (PT) but this has been in relation to the relationship with the student rather than how they carry out the use of LA data and more research needs to be done with student engagement (Wakelin, 2021). Therefore this study aims to discover how PTs are using LA data in undergraduate courses at the UOG.

While there have been several studies on the disruption caused during the pandemic and how HEIs responded, there is very little literature on how student engagement and interaction with LA tools has been affected post pandemic (Cellik, 2023). This study focuses on student engagement and whether LA can make a difference in post pandemic education.

There has been a call for more LA studies to use mixed methods design with quantitative

data still being the dominant approach (Guzmán-Valenzuel et al, 2021). This study aims to use mixed methods to further the results and increase validity of the RQs.

The next chapter discusses the methods used to carry out this study including mixed methods design.

CHAPTER THREE
METHODOLOGY

Introduction

This chapter discusses the methods carried out in the research. The first method used was a questionnaire which was sent out to all participants with the option of signing up for an interview. The second method was semi structured interviews with open ended questions. The two will then be brought together to form triangulation.

The advantage of using semi structured interviews (SSI) is their flexibility and this includes being able to create an interview schedule beforehand. Further flexibility for this study was in the form of using MS Teams which provided convenience for both parties.

Cassell (2015) highlights disadvantages of using the interview as a research method. She states that recruiting participants to take part in an interview can be a time-consuming process but this was fairly straight forward due to my role as Learner Analytics Co-ordinator at the University, I already have existing contacts I could approach including outside organisations such as Jisc (the company who have developed the Data Explorer system) and I had access to the internal staff email address so the initial questionnaire was sent over with an explanation on what the research was about.

There are also disadvantages to using quantitative methods. As Rahman (2017) describes, the main limitation of using quantitative research is that it cannot “ascertain deeper and underlying meanings and explanations” (Rahman, 2017, p106). Further to this, Bergin (2018) states that quantitative research is limited by “the need to reduce complex phenomena or social structures to a selection of represented variables that do not offer a ‘true’ feel for the nuances and complexities of these structures” (Bergin, 2018, p20). The detailed information for the phenomena in this study was only provided by the in depth interviews and opinions offered by qualitative research.

In this case study, quantitative data analysis was considered but ultimately could not be included due to a lack of different variables to measure. The limitations for this study are further discussed in Chapter 7 (p95). Examples of quantitative data analysis include

correlation testing (looking for associations and differences) and descriptive statistics (describing the characteristics of a dataset). An initial test of Central Tendency (measuring the mean , mode and median of a dataset) did not produce any significant results or highlight any differences that could be included in analysis.

This was a mixed methods case study where qualitative data is based on people's experiences of using the quantitative Learning Analytics (LA) data available to them in the Learning Analytics dashboard (LAD) Data Explorer.

3.1 Mixed Methods

The study has been carried out as mixed methods study, using both qualitative and quantitative methods in order to discover staff opinions and experiences. Shorten and Smith (2017, p74) define mixed methods as "a research approach whereby researchers collect and analyse both quantitative and qualitative data within the same study". They continue to say that "a mixed methods design is appropriate for answering research questions that neither quantitative or qualitative methods would answer alone" (Shorten and Smith, 2017, p75).

In relation to evaluation, the questionnaire was chosen to see how far participants agreed with the set question on a Likert scale while the interviews were chosen to break down the response and find out why they agreed or disagreed allowing for a holistic view of the phenomenon. The dominant method is quantitative (given that the Data Explorer dashboard contains purely numerical data) but it cannot provide the answer to the research questions without the use of the qualitative data which allows for an in-depth analysis of staff opinions. For example, although the quantitative data could tell us how many personal tutors are using the data, it cannot tell us what they are using that data for and if there is more than one reason. This is a question that can only be answered using the qualitative methods and analysis.

Quantitative data was collected via the use of a questionnaire, sent out to all academic staff (a total of 1143) and qualitative data was obtained using semi structured interviews (n=19 out of 63). Quantitative methods refer to gathering numerical data and traditionally are associated with a positivist view while qualitative data takes an interpretivist approach and is used to gather in depth information on people's experiences. Examples of qualitative methods include interviews, focus groups and phenomenology while examples of quantitative methods include surveys and experiments. Focus groups involve participants

discussing a phenomenon in groups with a moderator and phenomenology refers to the experiences of individuals for a particular subject being studied.

In this case study, the research questions cannot be answered without the use of both methods because the qualitative data is based on people's experiences of using the quantitative Learning Analytics data from the dashboard (and the questionnaire focuses on this data) and therefore a mixed methods approach was decided.

In terms of deciding the rationale for using mixed methods, there are three reasons to be considered. These have been defined as triangulation, illumination and diversification (Bergin, 2018) and there are also different types of mixed methods research. Triangulation seeks to explore whether the results from each method match up and provide an overall view to the research question, illumination involves "using the results from one method to inspire new questions to investigate the other method" (Bergin, 2018, p183) and diversification allows the researcher to find "additional aspects of a phenomenon that cannot be investigated using the other method alone" (Bergin, 2018, p183). The rationale for employing mixed methods in this study is triangulation. Responses from the questionnaire were echoed in the interviews and participants were able to provide more detail and expand those responses. There are three approaches to carrying out a mixed methods study and it includes the following: parallel, consecutive and mixed. This case study carried out the consecutive approach with the quantitative data appearing first in the questionnaire responses. The qualitative data was obtained secondly in the interviews.

This study therefore contains both positivist and interpretivist frameworks as mentioned in the Introduction. The qualitative data is associated with interpretivism while quantitative data associates with positivism.

3.2. Case Study Design

This study will be a single exploratory case study focusing on the experiences of academic staff at the UOG who use LA in their roles. Yin defines a case study as "an empirical method that investigates a contemporary phenomenon in depth and within its real-world context, especially when the boundaries between phenomenon and context may not be clearly evident." (Yin, 2018). In this case study, LA is defined as the contemporary phenomenon being studied and the University is the real-life context.

An exploratory case study refers to case studies that “explore situations in which the case (for example intervention) being evaluated has no clear or single set of outcomes” (Lucas et al, 2018, p2). In this study, Learning Analytics is the intervention being evaluated. As posed by Yin (2018), further differences between exploratory case studies and the explanatory case study include that exploratory case studies use ‘how’ and ‘what questions whereas explanatory case studies focus on ‘how’ and ‘why’ (Yin, 2018). There are also differences between the case study and an exploratory case study. The case study uses all three questions:’ how, why and what’. This study focuses on how and what questions for research questions 1 and 2. The research will show the impact of LA across the four Schools of the UOG, for example, the School of Education and Applied Sciences. Single case studies have been described as “usually sample typical or unique cases, their advantage being the depth and richness that can be achieved over a long period of time” (Grant et al, 2020, p4).

A case study can be further defined as: ‘a research approach that is used to generate an in-depth, multi-faceted understanding of a complex issue in its real-life context’. (Crowe et al., 2011, p.1). Case studies are used when the researcher needs to gain further insight into a phenomenon and to establish the answers to the how, what and why components of research questions. For example in the case of answering RQ2, (How are personal tutors using LA in UOG undergraduate degrees?) this will uncover how the interventions process works, what is effective and what isn’t and why some tutors might not be using LA at all.

The real- life context for this study is the University itself as the sample is taken across all academic staff and the data comes from its processes and systems. This evaluation is an in-depth look at a single organisation so therefore has been carried out as a single, exploratory case study.

Yazan’s (2015) article discusses who the founders of case study design are considered to be and reviews each of their approaches. These founders are: Yin (1994), Stake (1995) and Merriam (1998). Yin’s design follows a positivist approach, Stake’s interpretive and Merriam is a combination of positivist and interpretive approaches. Yin believes that a case study is “an empirical method that investigates a contemporary phenomenon in depth and within its real-world context, especially when the boundaries between phenomenon and context may not be clearly evident” (Yin, 2018, p14). LA is the contemporary phenomenon being studied and can be defined as new as it has been an active field since 2011 with some HEIs in the UK embedding dashboards as recently as 2023.

Yin (2018) has identified the following elements that must be acknowledged in case study research. This includes reliability, validity and other forms of validity including external validity and internal validity for case studies. Validity has been described as a way "of demonstrating and communicating the rigour of research processes and the trustworthiness of research findings." (Roberts and Priest, 2006). A consideration during the questionnaire design was to avoid questions that sounded ambiguous in order to keep the data reliable and not mislead participants. This was achieved through testing and questions were rewritten if necessary.

The type of validity that can be applied to this study is external validity which "focuses on whether the findings of a single study can be generalised to additional settings, historical periods, groups, or societies." (Bergin, 2018, p27). Certain areas of this single study can be generalised to additional settings as it would be possible to do a similar evaluation at another HEI that uses the same analytics and Data Explorer which could be carried out as a longitudinal comparison study (see Chapter Seven). Internal validity "examines whether the study design, conduct, and analysis answer the research questions without bias" (Andrade, 2018, p498).

In contrast to Yin's approach, Stake takes an interpretivist view. The more dominant approach for this case study would be interpretivism. However, as it is a mixed methods study, positivism can be taken into account. Stake describes three different types of case study which include intrinsic, instrumental and collective. The type that can be adhered to for this case study is instrumental which "uses a particular case (some of which may be better than others) to gain a broader appreciation of an issue or phenomenon." (Crowe et al, 2011, p2). The exploratory case study design is being used to gain further insight into participants' experiences.

3.3 Data Collection

Data collection was divided into methods that were qualitative (semi structured interviews) and quantitative (questionnaire) to carry out the mixed methods study. A process to see if triangulation had been achieved was also carried out.

As part of the recruitment of participants, emails were sent out to all Academic staff of the UOG. The participants comprised of academic staff (N=63) from across all disciplines of the UOG. They were either module tutors, personal tutors or both. A module tutor (MT) primarily uses the dashboard to carry out attendance at the start of each session. In contrast, a

personal tutor (PT) uses it to monitor the data and use that data as a basis for conversations with their students. Participants were first given a questionnaire which included the option of signing up for the interview.

The study began in Semester 1 (September - December) and a total of 59 responses to the questionnaire were collated during this time. To obtain further responses and reach as many academic staff as possible, the questionnaire was also sent out at the start of Semester 2 (January -March) and a further 5 responses were collated.

3.3.1 Secondary Data

To further analyse results for RQ3, data collection of secondary data sources including existing PBI reports were used in relation to measure student engagement since the pandemic. Other secondary data sources include historical engagement data from Moodle (VLE) interactions and Jisc to view the Overall Rating. This is also known as a RAG (Red, Amber, Green rating and is further discussed in Chapter Four.

3.4 Method 1: Questionnaire

Questionnaires were chosen for the study in order to determine which groups participants would fall into for interview (module or personal tutors). Quantitative data consists of numerical data gathered in data collection. Methods used to carry out quantitative data include online quantitative surveys, observation and secondary data sources. This study uses a questionnaire that included both quantitative and qualitative data. A questionnaire is a research tool (also known as an instrument) used to obtain data about the phenomenon.

The questionnaire was created using Microsoft Forms and included a Consent form (see Appendix 3), an Information Sheet (see Appendix 3), the questions and a debrief sheet (see Appendix 4). No demographic data for participants was collected as it would not have made a difference to the types of questions asked. However, it was discovered later that this was not necessarily the case (see Chapter Seven). The first step of creating the questionnaire involved piloting to ensure the links worked, that it maintained anonymity and that the questions did not pose any bias. The questionnaire pilot was carried out on a small scale.

The questionnaire was made up of 10 open and closed questions, ordinal (ranked and ordered data such as age) and nominal data (qualitative data) and Likert scale questions. The Likert scale was used to find out how far participants agreed or disagreed with the

questions set. Closed allowed the quantitative data to be collected. An advantage of the open questions meant that participants were not restricted in how they responded. Any restriction was prevented by creating the option of using ‘Other’ which is an example of nominal or qualitative data within the questionnaire. The answers for questions with the ‘Other’ option are analysed in Chapter Five (per research question) as it produced further findings. These findings were analysed using reflexive thematic analysis, as with the qualitative data from the interviews. The multiple- choice options listed the options that were already known per question and the inclusion of ‘Other’ refers to responses that are not part of the initial choices and can allow for further feedback from participants to be gathered.

Questions that were presented as ranking questions asked staff the system’s level of helpfulness and how often they used Data Explorer. The scale ranged from somewhat helpful to very unhelpful. These types of questions were included to assist with meeting Research objective 1 (RO1) which was to carry out a review of the current technology used and to gain participant views. The data from the questionnaire was placed into an Excel spreadsheet and then uploaded into a Power Bi (PBI) report to present the results (see Chapter Six).

As with Research Question 2, (RQ2), the data was collated from the results in MS Forms, placed into Excel as a tally and split between module and personal tutors. The purpose of this was to discover if there were differences in the ways in which each group uses LA data. The results of this are presented in Chapter Five.

3.4.2 Method 2: Semi structured Interviews

There are three types of research interviews: structured, semi structured and unstructured and different types within each one. Although the questionnaire contained some of the same questions as in the interviews, it mostly provided quantitative data and semi structured interviews were used to gain more in-depth answers. Semi structured interviews have been divided into three different types (Cassell 2015): exploratory, theoretical and event-based. The type needed for this study is exploratory and allows the researcher to gather data and in-depth views about a phenomenon using data analysis techniques such as thematic analysis. Event- based interviews refer to using the critical incident technique (CIT). CIT was founded by Flanagan in 1954 and it involves asking participants about a specific incident that has occurred. Cassell (2015) describes the questions used in a CIT interview as “why it happened, what happened, when it happened,

who was involved and why" (Cassell, 2015, p18). Theoretical interviews involve generating the data and analysis includes grounded theory (GT).

Structured interviews are divided into "information gathering and hypothesis testing" (Cassell, 2015, pp57-59). Types of interviews featured under unstructured interviews include phenomenological interviews, where researchers aim to "gain the interviewee's description of a phenomena of interest" (Cassell, 2015, p70). Qualitative data came from the semi structured interviews and was the second method used in the study. There are also different types of questions that can be used for conducting research interviews. One category of questions is prompt questions and these are used to obtain a further response from the interviewee when they might not have covered all the information needed for the question. Prompts were used on occasion in this study but interviewees were often very thorough in their answers so it was not always needed. Other types of questions include open ended and closed questions.

The first step of conducting the interviews was to design the interview questions which were roughly adhered to as some interviewees were very thorough in their responses. The next step involved reviewing the responses from the questionnaire. In the questionnaire, participants were given the option to sign up for a follow up interview. If participants had agreed to interview, the Interview consent form was sent over. Some interview questions were the same as those used in the questionnaire. The option of a follow up interview allowed the answers to be elaborated further.

Initially there were four groups of potential interviewees. These were module tutors, personal tutors, professional staff and students. Professional staff refers to non-academic roles such as those in the IT/Library departments and Academic Services. Due to timescales (students) and lack of use surrounding LA (professional staff), the groups were limited to the module and personal tutor groups.

The questions in the interview aimed to answer the research questions by finding out more about how helpful staff believed the data in Data Explorer is to them, the way personal tutor interventions with students work at UOG and the impact this has on students and whether staff believed LA can help with establishing student engagement post lockdown. Post lockdown is from 2021 onwards and refers to a period of hybrid teaching where some classes were back face to face and others were still online. These questions were asked in the questionnaire (with the exception of questions relating to lockdown) but were also asked in the interview to gain more in-depth responses. Interviews were organised with staff

according to when suited them best and largely took place on Teams. Participants were given the choice between Teams or face to face and there was only one face to face interview with all others choosing Teams to do so. The benefits of using Teams allows for flexibility for both the interviewer and participant. It also resolved the issue of finding somewhere on campus to carry out the interview which is described below.
For face to face interviews, Teams was still able to be used on the laptop so it was recorded and transcribed the same way. Another part of preparing for the face to face interview was finding a suitable location on campus and this was challenging due to rooms being booked out for lectures. Only one interview was done face to face and this was able to be carried out in the tutor's office space. Participants were sent a debrief and a copy of their transcript. This was sent over a in a zip file marked Confidential. The purpose of this was so they could check the transcript and choose to omit/add/amend any of the text. This was to confirm whether they were happy with what had been transcribed. In this study, interviewees stated that they had no issues with their views and did not choose to amend any text.

The next steps in conducting semi structured interviews are post interview and involved transcribing and data analysis. Analysis is discussed in the following section. The process of transcribing interviews has evolved through the use of changing technology. Before Microsoft Teams, it required manual transcription by listening to the recorded interviews which would be a time-consuming process. The interviews for this study were largely conducted on Microsoft Teams which includes a transcript of the meeting so the bulk of the work was already done. However, the transcript did not pick up everything that was said accurately so some wording had to be corrected but it has proved useful and saved time for thematic analysis, which involves reading and re reading the transcript to identify the themes and generate codes by highlighting relevant parts of the interview transcription.

The final part of conducting semi structured interviews comes when a point of saturation is reached. Catherine Cassell (2015) highlights the concern of how many interviews is enough in qualitative research. She states that there are several views that the researcher can consider in order to determine this. The views include that interviews should be stopped after they stop generating anything that is new and not been stated before. Saturation was achieved in this study once the same themes and codes were able to be generated despite participants stating their views in different ways.

3.5 Data Analysis

3.5.1 Qualitative Analysis: Reflexive Thematic Analysis

The interviews were analysed using reflexive thematic analysis (RTA) given that the aim of the interview is to obtain qualitative information about the phenomenon being studied. There are three approaches to thematic analysis that have been identified by Braun and Clark (2021): coding reliability TA, codebook approaches to TA and reflexive thematic analysis. Since their original 2006 article, they have classified RTA as a purely qualitative approach whereas previously it was applicable to both ontological and epistemological views (Braun and Clark, 2019). The original study by Braun and Clarke (2006) covers the process of carrying out a thematic analysis and they also go on to outline the benefits and limitations. Braun and Clarke note that these phases do not have to be carried out in any particular order allowing the researcher flexibility, one of the advantages of using this process.

There are six steps involved in carrying out reflexive thematic analysis (Braun & Clarke, 2006) and this analysis will follow those. The six steps they identify are: “familiarising yourself with your data, generating initial codes, searching for themes, reviewing themes, defining and naming themes and producing the report” (Braun and Clark, 2006, p6). Since 2006, the six steps have changed names to become: i). Familiarising yourself with the dataset, ii). Coding, iii). Generating initial themes, iv). Developing and reviewing themes, v). Refining, defining and naming themes and vi). Writing up (Braun and Clarke, 2021) and the process named as reflexive TA (as described above).

For step one, each interview was looked at in detail and the process of open coding was used. For Braun and Clarke, step one involves ensuring you are familiar with your dataset which means reading and re-reading the data. Open coding is the first stage of the coding process and means that no pre-set codes were used but instead they were expanded on and changed as I moved through the process. The two other stages of coding include axial coding and focused coding. Axial coding is a continuation of the process and involves locating connections between the codes that have already been generated and is used in steps 3 and 4. Focused coding involves refining the codes and reviewing the themes and it was used in steps 5 and 6. Codes were generated after the first interview had been completed.

The codes were created following step 2 of Braun and Clark’s process: Coding. The coding process involved reading through the interviews and highlighting important parts of the data that were relevant to the research question. These sections were then given an appropriate label or code and placed into Table 1 (p63). Codes added at this step included student attendance and data accuracy.

The themes were first identified by following step 3 of Braun and Clark (2021): generating initial themes. Themes that were identified initially included challenges, post pandemic issues from 2021 and the role of the personal tutor. The codes were placed under the above theme headings and included navigation, technical issues and data accuracy. Table 1 presents the themes and codes as identified in the interview transcriptions and Table 2 (p64) presents the themes and codes as identified in the response of 'Other' from the questionnaire. These answers were written and therefore contained qualitative data. Table 1 and 2 are presented in Chapter Five as part of the findings.

Initially there were four themes, each with two codes. Once more codes were discovered in the data (as more interviews were conducted and analysed), these were added to the original list and placed accordingly.

To complete the process, the data was revisited and themes were further established (Developing and reviewing themes: step 4). Upon completing these steps, a further theme of 'Feedback on the System' was added in with the following codes: time consuming and issues with cross teaching (where staff have to teach on modules they are not timetabled for and would therefore not have direct module access). This theme was added in as several codes fitted under the theme of 'Challenges.'

LA was also added as theme at this point as codes such as student engagement seemed to fit better with that theme than any others. The LA codes generated were staff knowledge, student engagement and data visualisation. Staff knowledge refers to a lack of knowledge of the LA data as a subject area. Student engagement was added here as staff focus on it when they look at LA data. Discussions around the data graphs in the system occurred during the interviews. The discussions sometimes included a screenshare to explain what the data means and therefore the code of data visualisation was added. Data visualisation refers to LA data such as how many clicks the student has made on Moodle resources and their attendance. LA can be applied as a theme throughout as it covers each research question.

Following this step, each theme was then further defined (Refining, defining and naming themes: step 5) and the final total number of themes came to five. They were presented as i) Learning Analytics, ii) Feedback on the system, iii) Challenges, iv) Role of the Personal tutor and v) Pandemic issues from 2021 onwards. Challenges and feedback on the system pertain to RQ1, the Role of the Personal tutor is in respect of answering RQ2 while

pandemic issues relate to RQ3. As discussed, the Learning Analytics theme can be applied to all three RQs.

The completed results will be discussed in the next chapter with extracts from the interviews (Writing up: step 6).

3.5.2 Qualitative Analysis: Triangulation

Triangulation is considered a qualitative method (Carter et al, 2014). Carter et al's article explains that there are four types of triangulation: (methodological, data, theory and investigator triangulation) which were identified by Denzin (1978). The type of triangulation applied to this study is methodological triangulation as it uses various methods to collect data in a single study. Investigator triangulation involves more than one researcher collecting data. Similarly, data triangulation involves analysing several sources of data to answer the same questions and theory triangulation involves using different theories to gain conclusions from the data.

In order to triangulate the data, participants' answers from both the questionnaire and interview were compared (n=19 out of 63). The responses were compared side by side in a spreadsheet to see if participants described the same challenge or benefit in both methods (for example). The purpose of this was to see if the same conclusions could be drawn for each question, thus increasing the validity of the findings.

There are several advantages to using triangulation in mixed methods research. Through converging the results post analysis, triangulation increases the validity of each RQ if the findings are the same. It can also reduce the possibilities of bias by including different perspectives of the same data and provides an overall picture of the phenomenon.

3.5.3 Sampling

Sampling occurs at the planning stages of any research project. There are several different types of sampling that can be chosen. Examples include snowball sampling (occurs when participants recommend another participant to the interviewer, thus increasing the sample size) and theoretical sampling. Cassell (2015) explains how theoretical sampling can be linked with grounded theory and who founded it (GT, Glaser and Strauss, 1967). GT involves producing a theory from the data once it has been generated rather than using any existing theories.

The sampling type chosen for the study was purposive sampling. It was the most appropriate choice for this study as the sample represented the two groups chosen for interview which were groups of module and personal tutors. The total sample number of participants was 63 with 19 signing on for a follow up interview. Palinkas et al (2015) defines the process of this as “identifying and selecting individuals or groups of individuals that are especially knowledgeable about or experienced with a phenomenon of interest” (Palinkas et al, 2015, p2). These two groups of University staff would have the most experience of using LA on a frequent basis and all use at the same system to view at least one category of LA data, notably Attendance making them the most knowledgeable.

3.6 Ethical Considerations

Bergin (2018) identifies several ethical concerns which include reflexivity, confidentiality, anonymity and replicability. Reflexivity considers the role of the researcher and their relationship with the data, confidentiality refers to ensuring that everything the participant says in the interview is private, anonymity allows the participant’s details to also remain private by allocating them a pseudonym instead of their full name. In this research, no demographic information was used such as age and gender as it was decided it did not impact the research questions. Replicability refers to the ability of the study to be copied and recreated.

Bergin states that if the study is done again in different circumstances then it is possible to “see whether your original findings have broader application” (Bergin, 2018, p57). In the case of replicability for this study, it would not be possible to repeat everything given that it is a study specific to the processes and population of the UOG. However, given that Universities in the wider Jisc community all use the same analytics in Data Explorer, a similar evaluation could be undertaken.

Therefore, as stated by Bergin above, some findings would be broad. In considering the concept of reflexivity, my role as LA Coordinator at the University has to be acknowledged. To help with this issue, researchers are encouraged to keep a log and reflect on outcomes. In my role, I have access to the dashboard data for students and tutors on Data Explorer. This raises the issue of bias being present due to my knowledge of LA but by conducting the interviews, I can discover if what I already know about how LA is carried out at the University is true or if there are differences across courses.

Issues have been identified with researching one's own organisation which is the case for this research. Cassell (2015) states that "the research will be informed by the knowledge that the interviewer already has of the organisation and the interviewees." (Cassell, 2015, p56). This has been a consideration given that I am also embedded in the academic community at the University. Niall Sclater created a Learning Analytics Code of Practice for Jisc in 2015. Topics in the Code include Responsibility and Transparency and Consent. Further concerns for LA are developed by Sclater (2018) in an FAQ document for Jisc. Questions covered in the FAQ document include 'how should we ask students for their consent?' and 'should we ask students for their consent to carry out learning analytics on their data?'

The University's aim is to be transparent about how we use student data and this is covered in the Student Charter and various policies relating to LA which define what it is and how the University is using student's details. Policies include the Learning Analytics policy (LA policy) and the Engagement and Attendance policy (EA policy) and presents 4 main sections which include an introduction, definitions, unexpected absences and monitoring engagement and attendance. The LA policy covers important topics such as 1) responsibility, 2). Transparency and consent and 3). Interventions. Transparency refers to how the UOG intends to provide clear information for students and how it will obtain their consent for the use of their data. Interventions describes the process and what is expected of students.

Participants in this study were given a consent form for the questionnaire and interview. The questionnaire consisted of the information sheet, the consent form and a debrief sheet. The study adhered to ethical guidelines and was approved by UOG's Research Ethics Committee (REC) prior to being carried out (Appendix 2).

For the interviews, participants were sent an information sheet and signed consent forms were obtained prior to the interview. Post interview, participants were sent a debrief and a transcript of the interview with a deadline of two weeks to omit/change/add any text in the transcript. Participants were given information on the procedure and why the study was being carried out and how their data would be stored and used. The data for this study was stored digitally in a password protected folder. Each participant was given a pseudonym to ensure anonymity throughout the study which consisted of 'Participant 1', Participant 2' and so on.

Summary

This chapter has covered the different methods that have been used to carry out this study. The mixed methods included semi structured interviews for qualitative data and questionnaire for quantitative data. The data analysis included reflexive thematic analysis (RTA) for the qualitative data.

The RTA generated four themes within the data. The themes were i) Challenges, ii). Feedback on the system, iii), iv) Role of the Personal Tutor, and v) Pandemic issues since 2021. The Learning Analytics theme pertains across all research questions, theme ii and iii refer to RQ1, theme iv refers to RQ2 and theme v refers to RQ3. These themes highlight current issues that have impacted the continued use of LA the most at the UOG since 2018 and illustrate the views of the participants.

Mixed methods were chosen for an impact evaluation due to the ability (via both methods) to increase the validity of the findings by using triangulation and therefore gain a full picture of what the impact of LA is. It is hoped that both methods will complement the other, supporting the evidence that either one presents. These results are discussed in Chapter Five. A key point of the evaluation is to depict participants' experiences of using the LA and both methods could show this from their point of view.

It has also presented any Ethical Considerations that had to be accounted for such as Transparency, Consent and Data storage. The next chapter will present secondary data analysis and the results of that analysis.

CHAPTER FOUR
SECONDARY DATA OF STUDENT ENGAGEMENT

Introduction

In order to meet the objective of RQ3 which was to illustrate any impact to student engagement over time, it was necessary to analyse secondary data from existing data sources provided by Jisc and the University IT department. The data sources included the calls from the Library, Technology and Information (LTI) Helpdesk, student attendance data from the Power Bi (PBI) report and Moodle engagement data (the number of clicks on the VLE pages). The Helpdesk calls are divided into Learning Analytics (LA) and Study Goal categories. LA calls tend to reference the data in the system and are normally raised by staff while Study Goal refers to the student web app and issues are raised by students or by staff on behalf of students. Secondary data for RQ2 was not gathered as no data for this question needed to be gathered over time and the primary data gathered provided results. This chapter describes the methods, results and analysis from this data.

Advantages and disadvantages of using secondary data have been identified in the literature. Johnston (2014) discusses the strengths as using secondary data can provide researchers with access to a variety of large datasets. I have gained access to datasets from the UOG and Jisc to provide substantial answers to my research questions and ensure their validity. These datasets contain data from 2021 onwards so I have been able to provide a longitudinal comparison for each one. Examples include the Helpdesk calls from the UOG and historical usage data from Jisc for Study Goal.

Although access to these data sets was useful, it was time consuming to put together the data needed for the Overall Rating and this required liaison with the IT data team due to its size. This meant placing an exceeding amount of data into the Data Warehouse temporarily in order to create a visualisation in Power Bi.

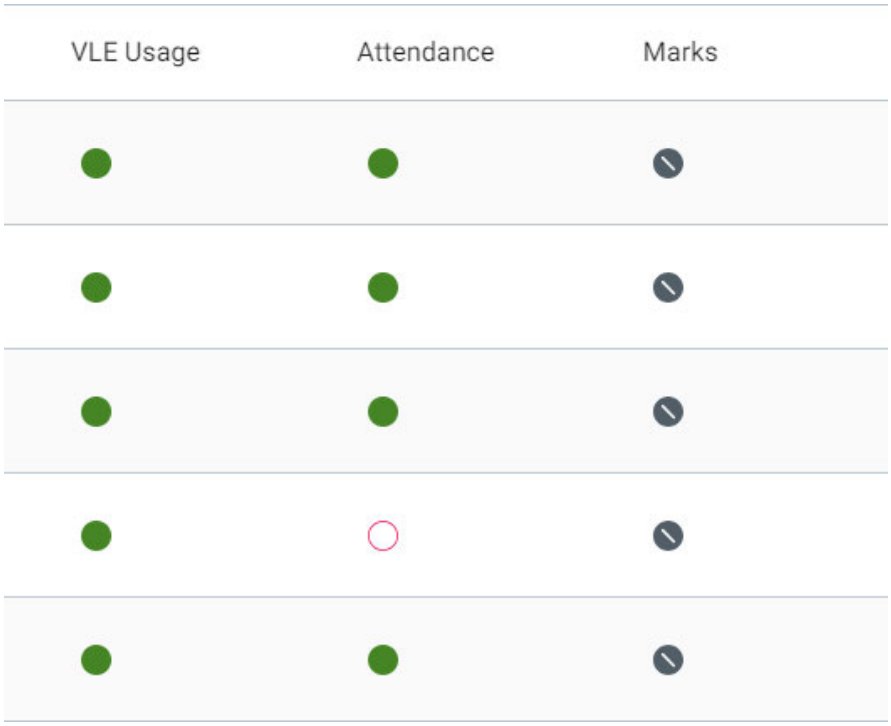
The sample size for the secondary data sources is from the entire student population of undergraduate courses (UOG has 200 courses in total and 5412 students for the current academic year 23/24).

4.1 The Data Explorer dashboard

Data Explorer (developed by Jisc) presents tutors with different types of data visualisations to view to monitor student engagement. Each module has its own overview page which is made up of the different data types in a dropdown. These include the weekly activity on the VLE, the content access per resource on the module, Attendance by Event and the percentage of Attendance. Attendance by Event allows staff to view student attendance per each seminar and lecture on a per module basis and Attendance percentage allows staff to view the percentage of attendance per student for that module. This is so they can check whether the student is hitting the 80% attendance target as per the UOG expectations. The last visualisation is titled Event Attendance by Student. This final visualisation option groups everything under one visualisation to give a general view of the students' attendance. Each of these data types is done on a per module basis.

Each student also has their own student page which gives an overview of the student's attendance as well as a module based specific view. Figure 2 (p52) shows the detail of what is on each student page. Each student is allocated a Red Amber or Green (RAG rating) and this is presented as an overall rating for that student which encompasses the three main measures of LA: VLE usage, attendance and marks. These measures are certainly used widely by HEIs and also by those HEIs who also use Data Explorer and are part of the Jisc community.

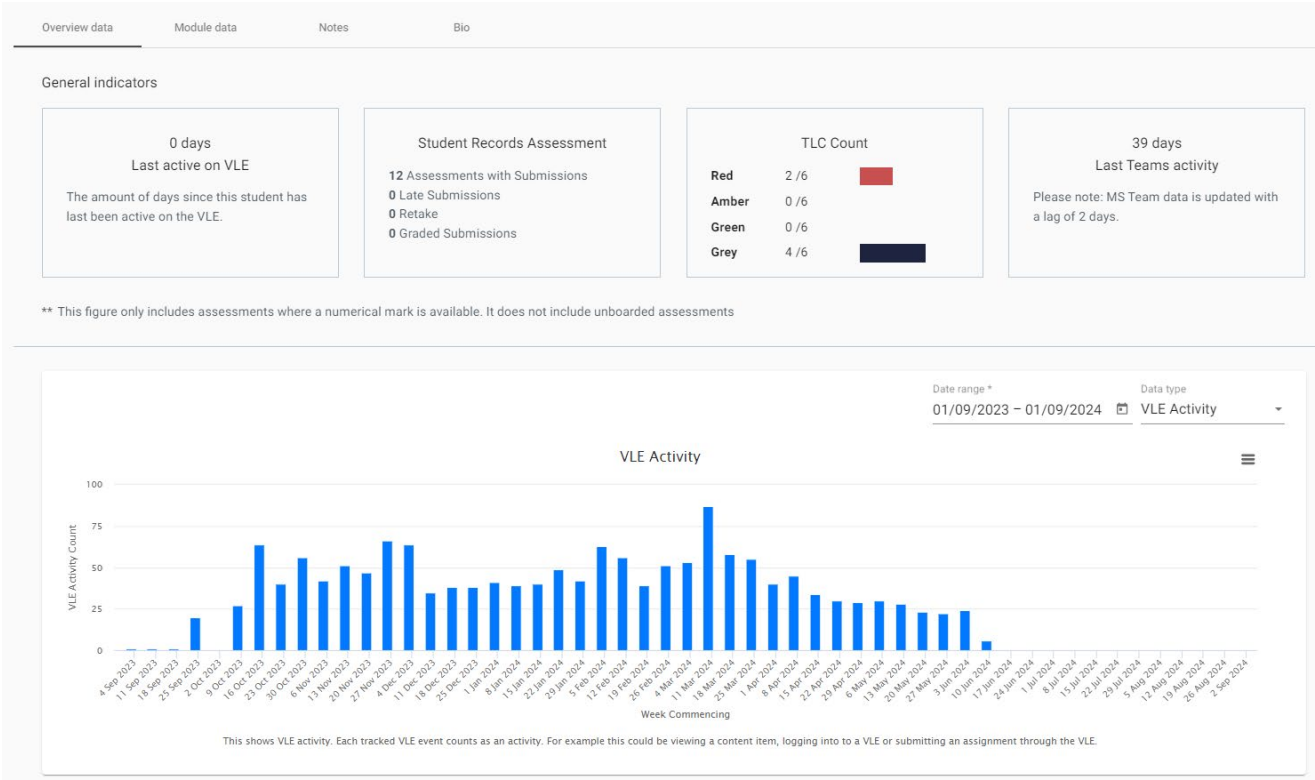
Figure 1: A summary of student attendance and engagement on Data Explorer.

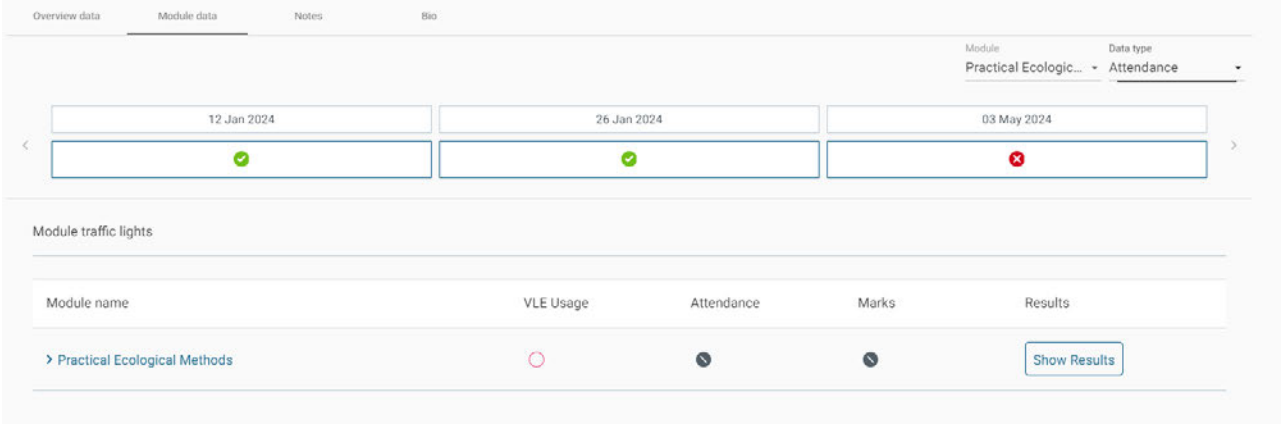


Source: Data Explorer dashboard: Jisc

Figure 1 presents a summary of a student's attendance which is present on each individual student page in Data Explorer. Red indicates the student might need help, green means they are above the average and have strong levels of engagement while grey with a line through it means insufficient data such as perhaps that assessment has not been completed yet.

Figure 2: A student's overview page on Data Explorer



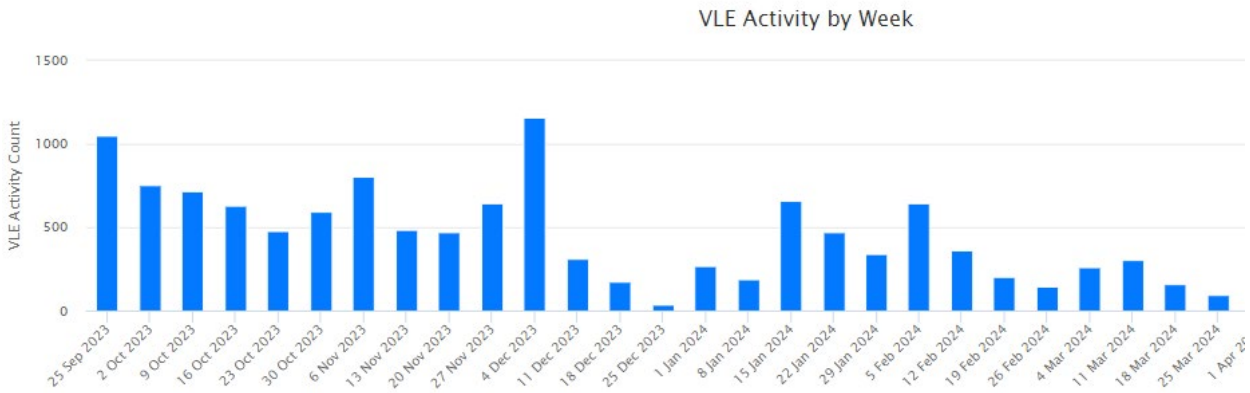


Source: Data Explorer dashboard: Jisc

Figure 2 presents the Student Overview page. The page contains two different tabs. The first tab is the Overview tab and contains general indicators of the student's engagement, a list of different data types including VLE weekly activity. Below this, the second tab, Module data, presents a brief summary of their attendance for each individual module (green shows they attended, red indicates they did not) and below this, there is an overview of all the modules for that student. In this example, the student may be a cause for concern as the VLE usage is in red, however, this might be because the module does not currently require any VLE activity thus indicating that this the record of Red is not

an accurate reflection. The attendance and marks have a grey rating because the module might have finished.

Figure 3: Student Activity on the VLE (Moodle) by week



Source: Data Explorer: Jisc

Figure 3 shows VLE activity by week. The example above is from the Data Explorer dashboard and is also showing the activity (including number of clicks) on Moodle. This is from the current academic year and shows September 23 to April 24. There is a dip in usage after December 4th. These dates would suggest that interactions cease over the holiday period. Both this graph and Figure 6 would further suggest that the time of year does make a difference as to how engaged students are with their courses as some months have higher usage than others (for example the patterns show that September has higher counts than August).

4.2 Results

Introduction

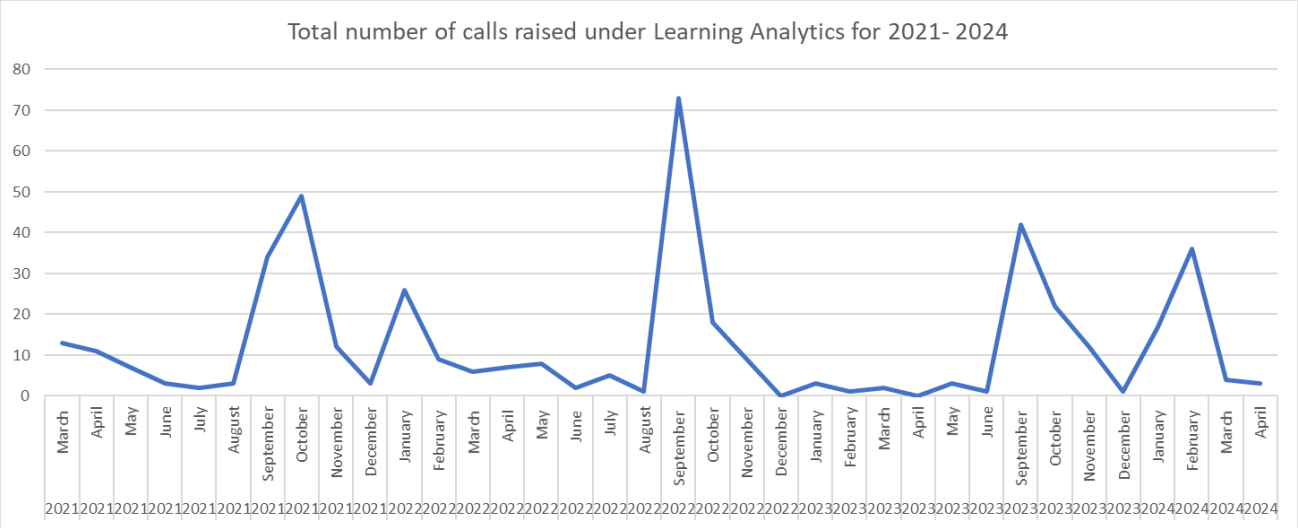
Research questions (RQs) 1 and 3 analyse secondary data to report student engagement and attendance over time as well as any challenges associated with the use of Data Explorer. All other results data was obtained from primary data in the study as the second research question did not require analysing any data over time.

4.2.1 RQ1: What are the benefits and challenges of using Data Explorer?

The aim of research question 1 was to explore the challenges faced by staff using the Data

Explorer dashboard as well as any benefits. The methods used to obtain this information were questionnaires and semi structured interviews. In order to see whether times of year made a difference to incidents raised, secondary data from the LTI department was obtained by downloading from our internal Helpdesk. This data was split into the categories of LA and Study Goal and was then converted into a line chart. The difference between these two is that the Study Goal category refers to students checking into lectures and Learning Analytics refers to the data available in the dashboard. Line charts show the progression of data over time and can be used to see trends and patterns. The figures below indicate similar patterns arising with a repeat of September and January being the highest months. Secondary data was not needed for benefits of using Data Explorer as this information was able to come purely from the primary data of this study.

Figure 4: The number of Helpdesk calls raised for the Learning Analytics category across 2021-2024



Source: Digital Solutions Helpdesk of UOG

Figure 4 shows the number of Helpdesk calls raised for 21-24 for the Learning Analytics category. For calls under the category of Learning Analytics, the total calls raised are between the same time and the total comes to n=447. The Study Goal category can be viewed in Figure 5. A similar pattern that also arises in Figure 5 shows that the peaks in the year come in September and January. Although some courses start in January, this would be later in the month. In the Helpdesk, staff calls are mostly collated as the category of Learning Analytics while student calls are categorised as Study Goal/Attendance Capture. Calls from staff involve not having access to modules/sessions as above or queries about the Learning Analytics data. Incidents reported by staff peaked at the start of Semester 1

(September-October) and 2 (January- February) across all years and 2022 has the highest level of calls in September. These incidents raised by staff are further referred to in Figure 11 (p76).

Figure 5: The number of Helpdesk calls raised for the Study Goal category across 2021-2024

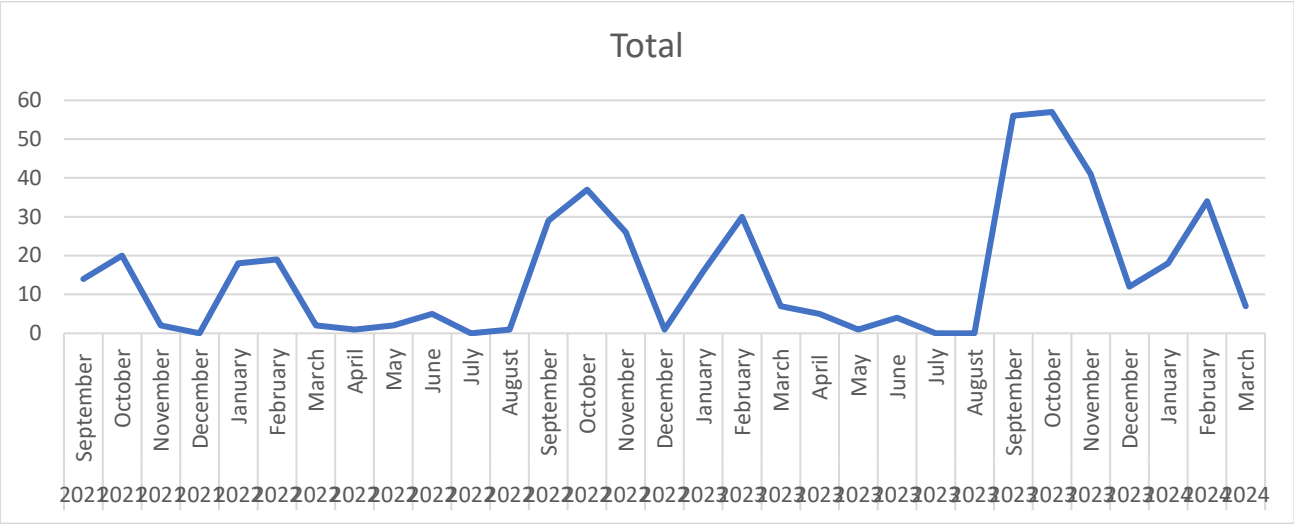


Figure 5 shows a similar progression for the Study Goal category (raised by students) where the total calls raised (between 2021-2024) is n=486. It also shows that the calls peak at the start of Semesters 1 and 2. This would suggest that these are the times which have the highest level of teaching sessions requiring student attendance and engagement. The types of incidents vary and range from students unable to check in to queries about their attendance data. Sometimes staff will also raise a call under Study Goal on behalf of the student (for example if they have visited the Helpzone) which could account for the higher number than the LA calls. Helpzone staff will also raise calls for students. The Helpzone refers to areas where students can go to ask questions. Overall Figure 5 shows a slow increase in the number of calls from students per year, with September showing as the highest month for all years. This is with the exception of September 2021 where the pattern changes and only 14 incidents were reported. This is a significantly lower number than the other years. This could suggest that Covid 19 is responsible for this low number and that since then, there has been an increase in the use of LA and the number of incidents related to using it. It can be anticipated that this pattern will be repeated in September 2024.

4.2.2 RQ3: Can the use of LA help with (re) establishing student engagement post lockdown (2021)?

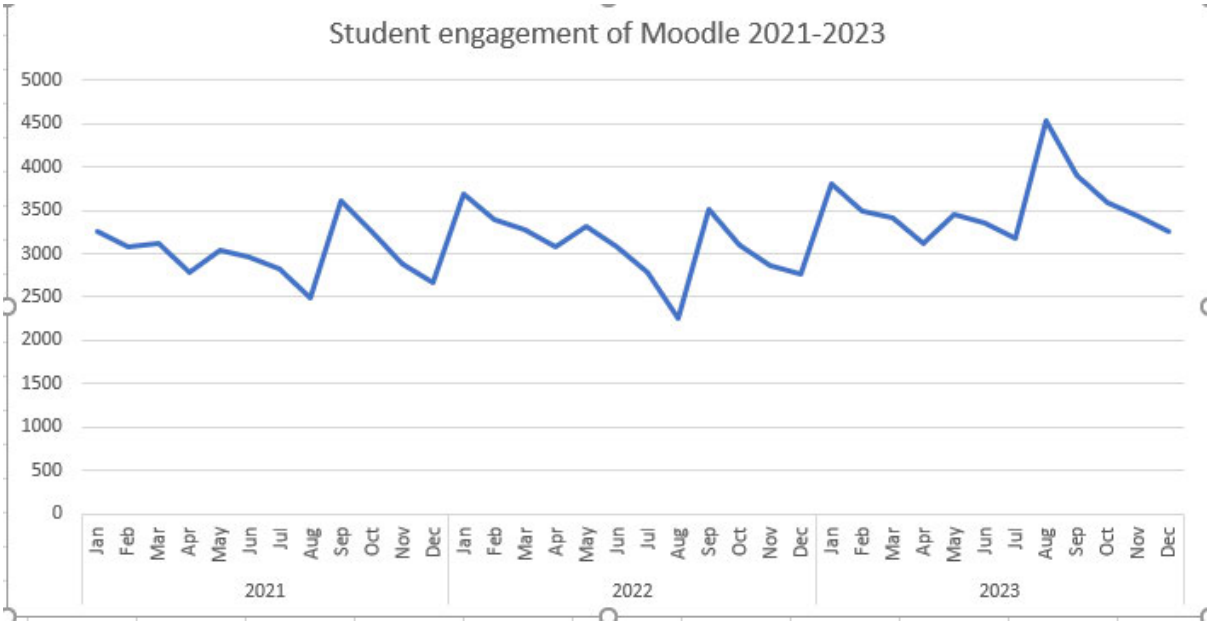
To analyse quantitative data for RQ3, secondary data sources were used. This is due to the need to measure student engagement and attendance over time since 2021. This data comes from existing Power BI (PBI) reports and Jisc data. Line charts will be used to show trends and patterns over time. Although each figure shows four schools, there were seven for 22/23 but this data has been amended as per the UOG Reset of the current academic year (23/24). Reset refers to the name of the restructure which saw several changes this academic year including the removal of a significant line of academic management and the reduction of seven schools to four.

4.2.3 Student engagement

Analysis of student engagement was carried out to look at whether the time of year makes a difference. For this analysis, student engagement refers to the interactions with the VLE. A time of year when student engagement with the VLE would be lower is in university holidays.

In Figure 6, data was aggregated by month to provide the detail over time and was obtained from the internal Moodle logs to view the VLE activity.

Figure 6: Student engagement on Moodle



Source: Digital Solutions Data Warehouse

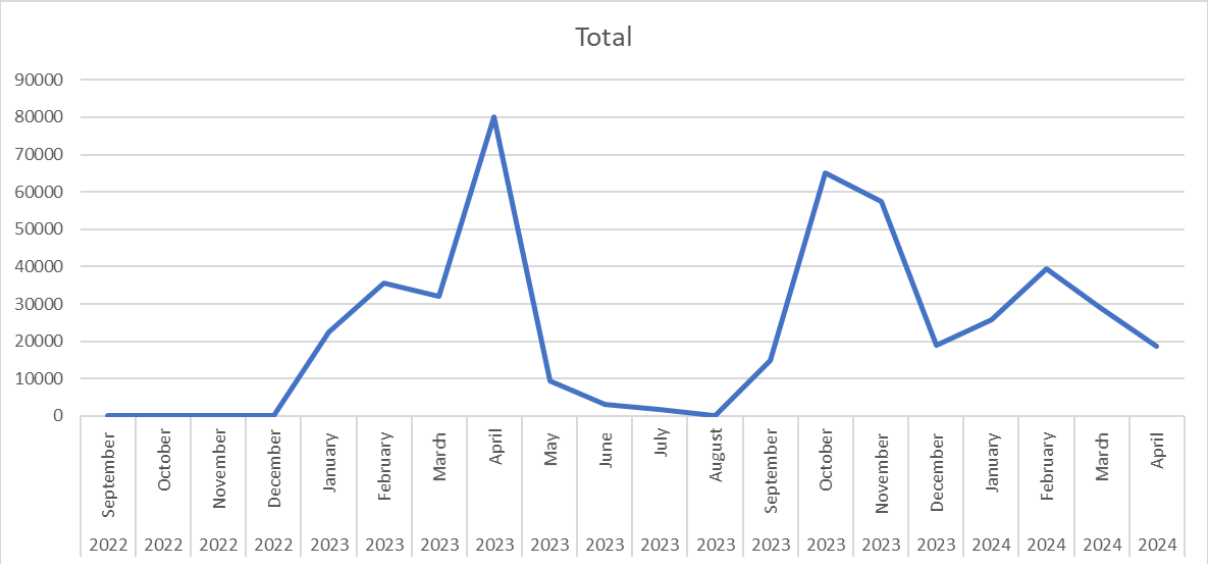
Figure 6 presents student engagement (activity on Moodle VLE refers to the number of

clicks on resources) across academic years 21-22 and 22-23. The line chart has been chosen to show any trends and patterns over time. The peaks in the year come at the times that would be expected to have more student activity and these include September and January. Across all three years, January has the highest number of interactions and the year with the highest number of clicks in January is 2023. This is due to courses that begin at this time of year. Another time of year that would make a difference is when there are final deadlines such as May. Again for May, 2022 is higher than 2021 and 2023 has the highest count overall.

The months containing university holidays, particularly July and August, are low for all years with the exception of August 2023 which has the unexpected high count of n= 4535. The main courses that contribute to this number for activity are from the Business school. The Business school teaches all year round because of apprenticeships which run in the summer months such as August. These Apprenticeships include at least two days per week of teaching time so the high figures represent students who are preparing for the teaching days by using Moodle to access resources or undertake any online activities such as quizzes.

In terms of whether the use of LA has re-established student engagement as per the research question, Figure 6 suggests an increase of Moodle activity from 2021 up to 2023.

Figure 7: Student Usage of Study Goal from September 22 to April 24

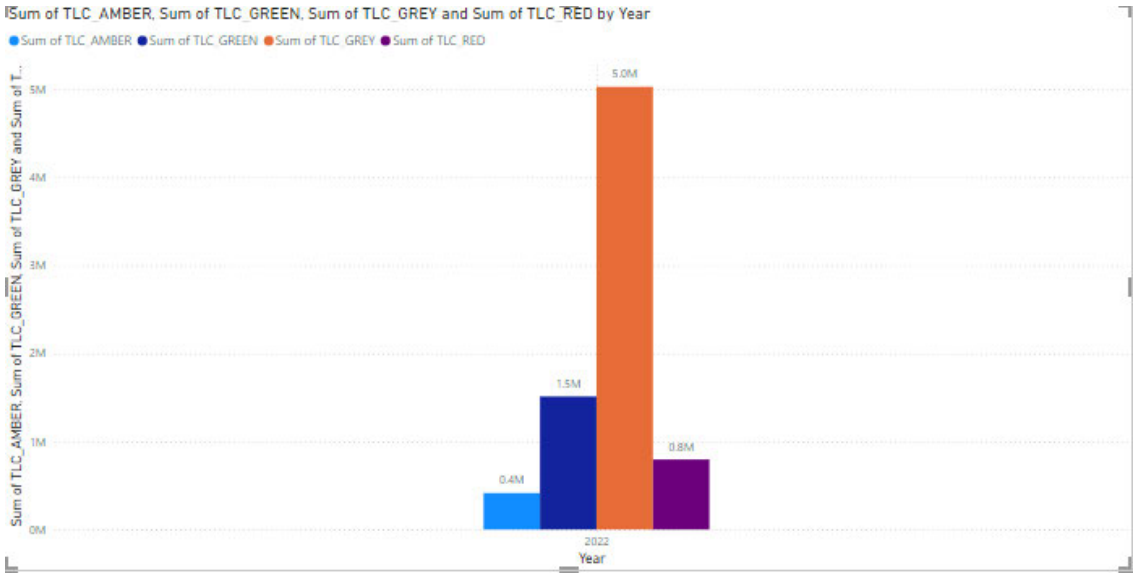


Source: Usage Stats: Data Explorer: Jisc

Figure 7 shows the usage of Study Goal between September 2022 and April 2024. September 22 was the first academic year to return to face to face teaching. It was not possible to obtain data before September 22 as this has been removed by Jisc as part of a data clean-up. Study Goal (developed by Jisc) is used by students to check into their lectures and view data. The usage encompasses any activity within Study Goal whether this is checking into a lecture or viewing the dashboard. Study Goal is only used by students whereas the Jisc LAD is only used by tutors.

There is a significant increase of usage between September 22 (n=32) and September 23 (n=14,719) and a further increase from December 22 (n=143) to January 23 (n=22,551). There is an unexpected finding where only 32 incidents were recorded in September 22 and the usage remains low until January 23. This breaks the pattern that follows where September contains the highest number of incidents and would suggest that the pandemic had impacted student interaction for 2022-2023. However, the low usage in October (n= 13) and November (n=5) follows the same pattern as the Study Goal calls (Figure 5, p55) where the number of recorded incidents declines at the same period of time.

Figure 8: Overall Rating for 2022

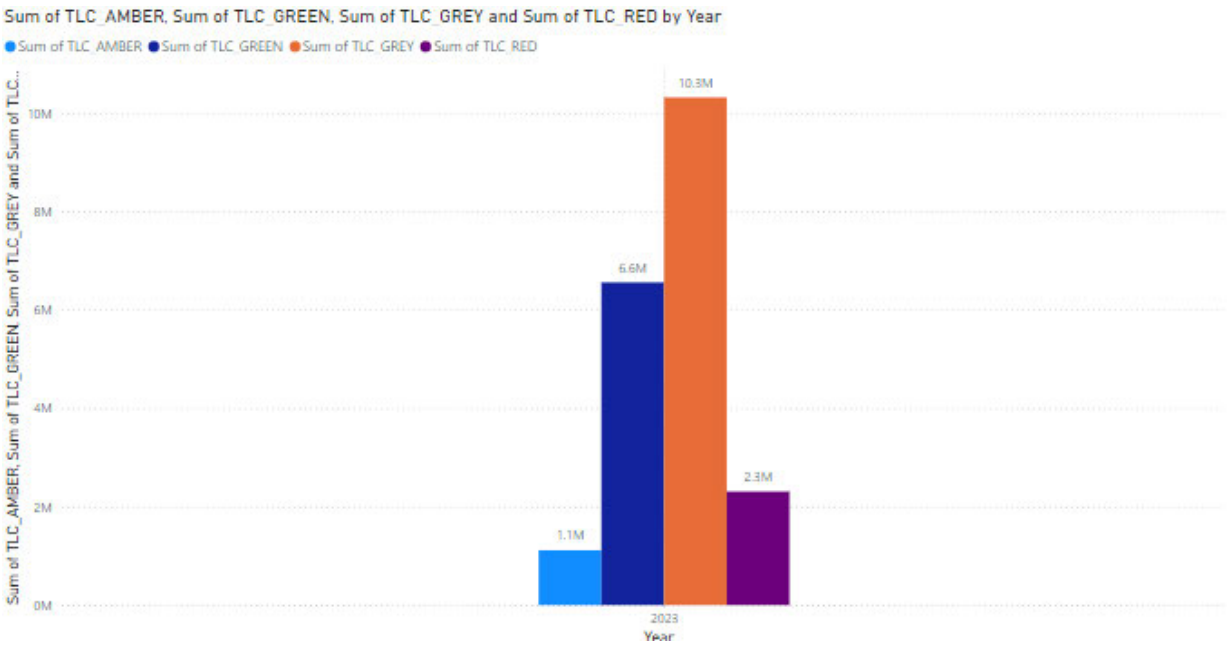


Source: Historical Jisc data

Figure 8 presents the overall rating from the academic years: 2022-2023. The overall rating is called a RAG (Red, Amber and Green) rating and encompasses all three LA measurements used by UOG. These are Attendance, Assessment and VLE usage. Figure 8

presents all four ratings: i) red means that there is a definite need for further investigation and a possible intervention, ii) green indicates that the data has not identified any issues, iii) amber means there is a potential cause for investigation but there are no significant issues yet and iv) grey means insufficient data and there could be several reasons for this rating. One reason is due to assessments not yet completed or modules not yet started. Another example occurs during the holidays, for example more students appeared with a Grey rating during the Christmas break due to lack of engagement and lack of classes during this time. However, some students may still be engaging with the VLE. Similarly to Figure 9, the highest rating is Grey followed by Green. Data for 2022 was only available from August and it was not possible to view data for 2021. This would partly account for why 2022 has the lowest number of Green ratings. 2022 has the lowest count for an overall rating of Green which is consistent with the pattern of 2021-2022 containing the lowest number of interactions. Months of 2022 included September- December 22. This would suggest that the pandemic had an impact on all three measurements during this year.

Figure 9: Overall Rating for 2023

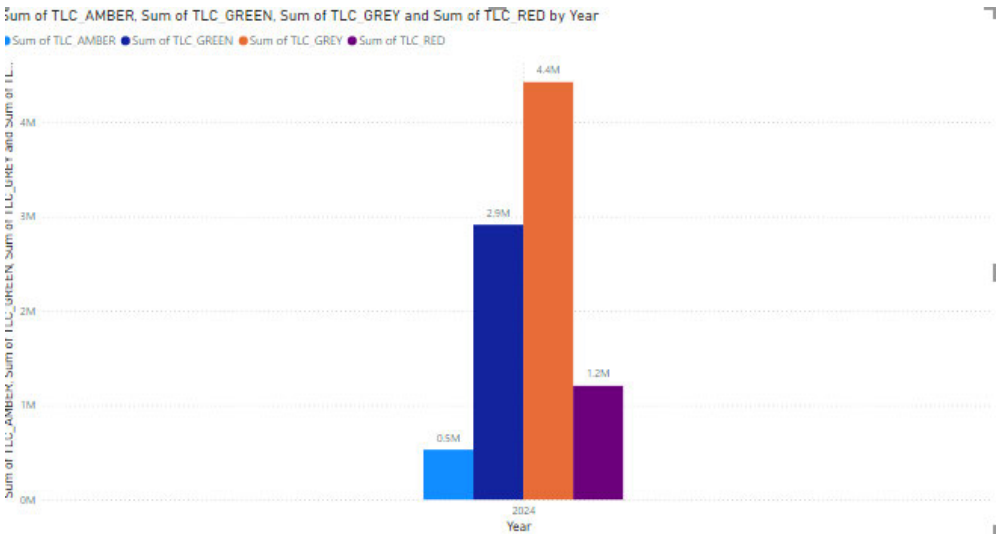


Source: Historical Jisc data

Figure 9 shows the Overall Rating for 2023. The pattern once again is consistent with Grey showing as the highest rating followed by Green. The count for Green is higher than in 2022.

A further insight gathered from this data is that some months have fewer students and during 2023, this number decreased after September and then peaked in again in January, which is a pattern consistent with other data gathered on the LA measurements in this chapter. For example data from August shows that there only two students received a rating that month, hence the lower numbers for all ratings. The month of September is lower due to some days not containing an overall rating. This corresponds with days of student activity on the VLE not starting until 20th September as classes won't have started until then.

Figure 10: Overall Rating for 2024



Source: Historical Jisc Data

Figure 10 presents the overall rating of each student per academic year, and encompasses the current year of 2023-2024. The months contained are January to April and the highest rating is Grey, once again followed by Green. This might be due to months such as January where courses start later in the month and students are more likely to receive a Grey rating for earlier dates.

Summary

This chapter has presented the results and analysis of secondary data. Secondary data was used in order to analyse student attendance and engagement over time. The years examined were 2021-2022, 2022-2023 and 2023-2024.

The results of the secondary data have indicated that LA has made a difference to student engagement in post pandemic education. There has been a rising use of LA tools since 2021 (including Study Goal and use of the VLE (Moodle). LA is measured on VLE usage, Attendance and Assessment.

For each visualisation (including the Overall Rating), 2021 and 2022 shows the lowest amount of VLE usage and attendance in comparison with other years. This would suggest that the use of LA has been impacted by the pandemic during that period but has increased since then. The data also shows that there is consistent pattern with usage, increasing in September and then declining through to April.

Overall, the data indicates that the Covid pandemic did have an impact on the use of LA (in particular, the Study Goal usage) during 2021. This is due to the months in 2021 having lower statistics compared with 2023 although it peaks and drops at similar times (Figure 7, p58). It was not possible to provide data showing whether the number of students or courses had changed during the time periods studied (2021-2024).

The next chapter presents the results from the primary sources of the interviews. This includes a thematic analysis with extracts from the interviews, the results of triangulation (qualitative data). The results of the questionnaire are discussed in Chapter Six.

CHAPTER FIVE
QUALITITATIVE RESULTS

Introduction

The aim of the study was to find out what the impact of using LA has been on the UOG since 2018, taking into account the two-year Covid-19 pandemic. This chapter will discuss the findings of the study from the qualitative data. For each research question, the following section discusses the themes and codes from the thematic analysis and presents staff responses to the questions asked to participants in the interviews as well as the section Other from the qualitative questions of the questionnaire. The results have been split by the methodology used and Chapter Six will discuss the quantitative findings and discussion. Chapter Five and Six have further been split into the findings for each question followed by the discussion for each question. This structure has been placed with the aim of highlighting the key points that can answer the research questions.

5.1.1 Qualitative Analysis: Reflexive Thematic Analysis

For the semi-structured interviews, a total of five themes were generated from the data. How this was carried out is described in Chapter Three. The themes that were generated in the analysis comprised of: i) Challenges, ii) Feedback on the system, iii) The role of the personal tutor and iv) Pandemic related issues from 2021 onwards. Participants described challenges they faced when using the system to carry out Attendance Monitoring which led to generating multiple codes and the creation of the new theme: feedback on the system. For RQ2, the ways in which PTs use LA within their role was discussed in the interviews and is

presented in more detail in the results section. Participants discussed the effects of lockdown on student engagement as a result of the pandemic for RQ3.

In the questionnaire, there was the option of the response of 'Other' for some questions, allowing participants to write out qualitative answers as it was open ended. Three themes were identified as it was a smaller scale: i) The role of the personal tutor, ii) Feedback on the system and iii) Challenges. These themes are the same as the ones identified in Table 1 (p64). The themes and codes are presented in Table 1 in (p63) and Table 2 (p64). Table 2 followed the same process as Table 1 to generate the themes which was Braun and Clarke's six steps of RTA. Although the options of using 'Other' are from the questionnaire, they were analysed using the qualitative method and the findings are therefore presented in this chapter rather than Chapter Six.

The analysis of Table 2 (p64) responses did not produce any new themes but it did create new codes which included 'PT discussions' and 'Generating codes'. 'PT discussions' refers to the discussions personal tutors have with their personal tutees in meetings to discuss why they might not be engaged. 'Generating codes' refers to difficulties with the 4-digit code used by students to check into their lectures. Some codes remained the same as with the interviews (feedback on the system). The Learning Analytics (LA) theme was once again present and generated the same codes. Again, this is applicable to all questions.

Table 1: List of Codes for Thematic Analysis: Semi structured interviews

Themes	**Codes**	**Codes**	**Codes**
RQ1: Feedback on the system	Time consuming	Cross teaching	Module access
RQ1: Challenges	Technical issues	Navigation	Data Accuracy
RQ2: Role of the personal tutor	Use of LA	Interventions	Student Attendance

RQ3: Pandemic issues from 2021 onwards	Online teaching	Student Engagement	Mental Health

Table 2: List of Codes for Thematic Analysis: Other
Note: RQ3 was not part of the questionnaire.

Themes	**Codes**	**Codes**	**Codes**
RQ1: Feedback on the system	Time consuming	Cross teaching	Module access
RQ1: Challenges	Technical issues	Navigation	Data Accuracy
RQ2: Role of the personal tutor	Use of LA	PT discussions	Generating Codes

5.1.2 RQ 1: What are the benefits and challenges of using LA? (Thematic analysis)

The first set of questions in the interview were around the challenges faced by using Data Explorer. In order to uncover this information, participants were asked: “what challenges have you experienced when using LA?” and “what solutions could be put in place to overcome these challenges?” The interview responses then identified three key challenges which were coded as*: i). Technical issues, ii). Data accuracy and iii). Navigation of the Data Explorer system*. Responses varied with most participants using LA when they had concerns about a student but otherwise they would not use the data other than to take attendance. Benefits for using the system were predominantly identified using the questionnaire data and are discussed in Chapter Six.

Technical issues

Technological issues were identified as a key challenge of using LA in both the questionnaire and the interviews although the questionnaire highlighted this further. Issues included students not being able to check in, modules and sessions not appearing when needed and staff access to the system when cross teaching. This means that they cannot take a register for that module if they are not assigned to it and this can therefore affect the recording of student attendance. Missing sessions refers to the live attendance

sessions not appearing on the tutor's dashboard. Participants will need to take a paper register and the module tutor will have to input it later.

Participants explained that they did not believe that they were being shown the correct information but acknowledged that it is *"probably my, you know not being able to use the system correctly and not knowing where things are because the information's got to be there - it's just that I can't pull it out"* (Participant 2). To increase staff ability to use the system, workshops were organised with the aim of providing assistance and increasing the use of LA.

Prior to a class starting, participants felt that there were too many technological related tasks to remember to do that took up time and therefore increased reluctance to carry out attendance capture for live sessions. A participant explained some of the tasks that have to be done first which include: "*log into the machine, log into Moodle, log into learning analytics, and then they introduced 2 factor authentication, which meant that any system you log into wants this as well*" (Participant 13). 2 factor authentication refers to a security check in that requires staff approval before one can be verified to use.

Another area of technological issues revealed by the interviews is differences between the technical terminology used that can cause confusion and create gaps in participant knowledge. Across Professional Services, the system is referred to as Data Explorer where as participants referred to it as Jisc (the third-party company who manage it) and questioned what I was referring to when it was mentioned in the interviews. Learning Analytics has also been confused with other terms such as Attendance monitoring which enables course teams and personal tutors to have oversight of student engagement with their studies. LA refers to the existing data as a whole which also includes assessment and attendance data.

Data Accuracy

Teaching staff across the University view the data available in Data Explorer as inaccurate, particularly the student Red, Amber or Green (RAG rating). Each student is assigned a RAG rating on the student pages that gives staff an idea of how they are engaging. Responses from staff indicated a lack of knowledge in this area given that the RAG rating pulls in data from all three LA measurements: Attendance, Assessment and VLE usage but this is not obvious in the tutor dashboard. It is a common belief among teaching staff that it is inaccurate because it does not show them the attendance percentage they are expecting to see for the students they are looking at.

Participants also responded by saying that they do not view the RAG rating because they do not fully understand how it works. One tutor describes the concerns they have with the LA data which revolve around trust in the icons displayed for the RAG rating:

"because of that level of trust in the icons, I don't delve into it anymore to investigate why there are so many pull down menus: attendance, attendance by event, attendance percentage" (Participant 12).

This would suggest a lack of knowledge around how the data works as described above and a lack of clarity around what data makes up the overall percentage participants can see.

Navigation of the Data Explorer system

Navigation of the system became a consistently recognised challenge reported by staff using LA: "*I just know when I do go on it that trying to find the bit that I want it, it usually takes me a while to get to the bit that I want" (Participant 1).* One area of navigation in the system that causes confusion is access to modules as it only displays modules that are currently Active on the course so it can appear that the module is missing if it is not displaying. Another participant commented that: *"it needs to be completely user friendly for people who aren't very good at technology"* (Participant 2). During analysis, any parts of the interview relating to navigation of the system were coded under 'Navigation' and placed under the theme 'Challenges' (Table 1, p64). A further example of navigation issues is that participants found that when they use the back button to come out of the register, instead of taking them back to the list, it takes them back to the home screen, meaning they then have to locate the register again from scratch.

Further challenges were drawn from the interviews and were allocated to the theme 'Feedback on the system'. The codes that were generated under this theme included *i) Timing, ii) cross teaching and iii) module access*. Timing refers to the length of time setting up the attendance takes and the processes within it as staff stated that adding students manually is time consuming. However, this forms a large part of keeping the student profiles accurate in terms of their attendance and could lead to the situation where it appears the student hasn't been attending when they have been. Cross teaching refers to guest tutors or tutors who are not listed as the module tutor covering for another tutor. This causes issues relating to access and is a challenge that was consistently raised in the interviews. It prevents the guest tutors from being able to carry out attendance capture and requires discussions to take place on how best to resolve this. Module access refers to tutors having

difficulty accessing their modules and one reason might be because they do not yet have it on their timetable. In order to rectify this, it is necessary to provide clarity over which department to contact.

Questionnaire Response to 'Other''

The response to 'Other' identified additional challenges to those initially reported in the multiple-choice question (*What challenges arise when using Data Explorer?*). These included cross teaching (see Table 1, p64) where guest tutors are not able to have access to modules so therefore the session cannot be carried out live. A further issue was identified as students sharing the 4-digit code with other students who did not attend the live session. This results in inaccurate attendance as they are able to check in but are not actually present in the session. This is an ongoing issue at the UOG with suggestions given on how to police it.

While the response to 'Other' identified challenges, it also revealed a division among participants where some stated that they did not have any issues with the data and that it was working well. The participants who stated that they did not have any issues with the system declined to do a follow up interview indicating that they are comfortable using it or do not wish to voice their opinions in more detail.

Further findings were discovered in response to *How helpful is Data Explorer?* (Figure 12, p77). These responses were mostly negative and included reasons such as "*I'm not sure I can say - I find it quite frustrating as it doesn't seem to deliver what it promises"* (Participant 16). This would suggest that the participant is referring to a recurring theme of data accuracy in the system where they are not seeing what they expect to see in relation to student attendance percentages. Positive responses included '*Ability to see different ways students engage'* (Participant 7) and *'Quickly understand a student's attendance and attainment'* (Participant 17). These responses suggest that staff can see what the data is telling them and understand the benefits it's meant to bring. However, overall the response to benefits was the one where extended answers were the fewest and no additional benefits were raised by participants.

Discussion

5.1.3 RQ1: What are the benefits and challenges of using LA?

Findings showed that there was a total of three challenges raised in the interviews described above. The data presents four themes which have highlighted areas that have impacted the use of LA (Table 1, p64). Three of these themes recurred in the questionnaire response to ‘Other’ suggesting these are the issues participants wish to discuss.

RQ1 generated two themes with three codes each. The codes for Challenges were: i)Technical issues, ii) Navigation and iii) Data Accuracy. Codes for ‘Feedback on the system’ were time consuming, Cross teaching and module access. The theme ‘Feedback on the system’ was derived from further responses about difficulties using the system in the questionnaire option of ‘Other’. The recurrence of the theme in Table 2 (p64) would suggest that participants are keen to voice their thoughts in this regard.

The repetition of these codes could imply that students and tutors need to be consulted further when designing LA and that these are the areas that they would like to see improved. They would also then be able to provide their specific needs. This is linked back to the literature concerns regarding the lack of input from tutors and students during development phases of LA. This was reviewed by Marquez et al as recently as 2023 suggesting that this is an ongoing issue.

The Challenges theme also recurs in Table 2 (p64) and the codes generated suggest that although participants can use the system, these are the issues that can prevent access. These answers came from the response to the questionnaire option of ‘Other’. It would also suggest that the system needs to address these areas as room for improvement in order to make the system as user friendly as possible. These areas could also be highlighted in training sessions to try to mitigate some of the problems staff experience. Jisc’s upgrade of Data Explorer has corrected many of these issues with an interface that is easier to navigate and presents the information in one place.

The challenge of data accuracy can be compared to the findings in the literature. Alzahrani et al (2023) discussed the level of trust teaching staff have in LA stakeholders and the tools used. Data accuracy was revealed as a factor staff had a low level of trust in along with third party technology providers. They state that their findings can be used to provide recommendations to HEIs adopting LA and improving data accuracy is among them. They surmise that “there is a need for a high level of data accuracy and effective intervention and visualization output to increase the trust of data and feedback” (Alzahrani et al, 2023 p1). The findings in this study share similar views from staff with data accuracy consistently being recognised as a challenge in both the interviews and questionnaire feedback. Trust in the

data is a key reason why staff do not use the LA data in PT sessions and to improve this, guides are created to effectively show what the data means.

Challenges pertaining to the use of LA have been identified in the literature and share similar findings with this study. Many studies report on challenges in relation to LA implementation but they are still relevant for this study. Stakeholder buy in is an area that is an ongoing issue for the UOG and one that has been reported on in the literature (Avella et al, 2016). Further, areas identified by Alzahrani et al also include stakeholders and analytics culture. Alzaharani et al (2023) identified several themes that challenges were associated with. Their findings present similar challenges to those raised by participants of this study as outlined below. The themes most relevant to the UOG are analytics culture and stakeholder's involvement. These are issues that are ongoing for the UOG. The technology theme has been highlighted by the results of the questionnaire for this study (Figure 11, p76). The other themes of Ethics and leadership are still present but are less of an issue now the UOG is running LA as business as usual as strategies have already been put in place to minimise them.

The stakeholder's involvement theme is the most relevant theme to challenges at the UOG as although LA is an accepted process at the UOG, there are still those who are sceptical of its usefulness and induction provided for new staff who will not be familiar with the processes involved. Alzaharani et al's study identified that interaction with external stakeholders was a connection for institutions who had either fully adopted or partially adopted LA. This finding is applicable to the UOG as it has partnered with Jisc and works with them to resolve any challenges relating to the use of the system (reported to a Helpdesk).

As part of the analytics culture theme, Alzaharani et al found that staff resistance to using LA was a key factor in the institutions that had not fully adopted LA in relation to stakeholder involvement. However, staff resistance to using LA is still an issue at the UOG even though it would be in the category of full adoption. For example, some teaching staff across the University are reluctant to carry out manual attendance as it is time consuming but this is a key part of keeping the student profiles accurate. This suggests that the UOG needs to place further strategies to minimise resistance to LA.

5.2.1 RQ 2: How are personal tutors using LA in undergrad courses?

Findings for RQ2 were identified using reflexive thematic analysis (RTA) from Braun and Clarke (2021) following steps from their original process (Braun and Clarke, 2006) for the interviews and highlighted the different ways in which PTs use LA. The codes that were generated discovered from the data for this question were: *i) the use of LA, ii) Student Attendance and iii) Interventions* (see Table 1, p64). These codes were grouped under the Role of the Personal Tutor theme. The use of LA refers to both staff and student usage, student attendance refers to any issues involving the attendance system and interventions refers to the interventions process carried out by personal tutors.

The Use of LA

When academic tutors were acting as module tutor, the use of LA centred around using the system for primarily taking the attendance register and when they were having personal tutor meetings with students, the data would be used as a basis for conversations and to have a closer look at those who were not engaging. However, this was not the case for all staff and all disciplines. For example in some disciplines their primary concern is physical attendance in class and a participant stated that:

> *"It's really about being there in person. Learning comes from your peers and you learn from each other and having that community is a huge part of what it means to learn things"* (Participant 5).

Millican et al (2023) echo this by stating that "when students can get support from their peers, they are more likely to feel confident in learning." (Millican et al, 2023, p41). Their data (made up of interviews and questionnaires) found that "most students appear to share our feeling that engagement involves attending, participating in class and completing additional tasks set" (Millican et al, 2023, p48).

Some tutors use the data in addition to their own knowledge of the student and use the data to present to the student that they have not been engaging. A tutor explains the process they use as the following: "*So I would normally go into the Learning Analytics section so that I'm prepared with that knowledge before I speak with the student"* (Participant 4). Overall the participant felt that the data is incredibly useful because without it, *"you have no idea about that student's attendance unless you've got data to tell you"* (Participant 4). Another participant commented that:

"it is useful to have some data to kind of check whether students are engaged or not because obviously without that data the student could tell you "yes, I'm going to every session" (Participant 7).

These responses suggest that some PTs use LA at least to check the data before they have meetings with students. Further, the questionnaire responses also highlighted viewing the data before meetings with personal tutees as a way PTs use LA. This confirms that the data is being used to its correct purpose which is to act as basis for conversations with students and one tutor's response highlights this further as they use the system: *"to help inform and initiate conversations around attendance and engagement"* (Participant 8).

Student Attendance

Student attendance is one of the key measures of LA. Teaching staff are expected to carry out attendance capture for every live session students attend. It was coded under the 'Role of the PT' theme as it is a primary concern for that role. The process is known as Attendance monitoring and one major benefit is that Data Explorer can give staff a full picture of the Attendance level for all students even those who are difficult to contact or might have dropped off the radar. PTs are expected to use the LA data to view a student's attendance pattern and suggest ways of how the situation can be improved.

The interviews established that although student attendance is important, it is not the main focus of PT discussions with students, they also concentrate on their engagement because it's more about: "*gathering data that enables them to make the right choices. So I talk about engagement" (Participant 13)*". The tutor continued to explain that they ask students questions such as "*what are the things that can be put in place that can make it easier for you to engage more fully, more intensively with the opportunities for learning?"* (Participant 13) to help those who need interventions see ways to improve their situation.

Interventions

Responses from participants to RQ2 indicated that interventions are done differently across the four Schools with some tutors using LA as a basis for conversations and others choosing not to. The below analysis has uncovered reasons why some choose not to which vary. As there is now a new interventions process (launched in September 2023), staff were asked what they did before this came in place and how those interventions were recorded. The Engagement and Attendance policy (EA policy) describes the new stages of the

interventions process. The first stage applies to those students who are: “recorded as having missed 10-20 consecutive teaching activities will be reminded of their responsibilities to attend and engage in studies” (UOG, 2023, Engagement and Attendance policy). The second stage applies to students who are: “recorded as having missed 21 or more consecutive teaching activities or are recorded as having not met the submission deadline for up to 2 assessments, will be required to meet with their Personal Tutor” (UOG, 2023, Engagement and Attendance policy). The new policy also enables staff to record the interventions on internal systems. It was established that personal tutors did not always record interventions prior to September 2023 as stated below.

The lack of using the data for interventions mostly seemed to be the case for those with smaller cohorts (classes of 15 to 30 students) who know their students well enough to determine whether they are in class or not and observe engagement live in sessions. Due to these numbers, they already have a sense of what the attendance level is by observation in classes and their process of using the LA data is slightly different. As one tutor explained:

“I just I like to start off by knowing like, who's in the room. If I think that a particular student isn't attending and I kind of have that sense because like I said, we do have small class sizes. So we do kind of know effectively who's there and who's not there, and I will use the data to go a bit further into it” (Participant 3).

A tutor further describes how they carry out interventions without the use of the LA data: *“So when it comes to interventions, really, I think all of us do it in, in the classroom environment, we observe those who are struggling and we respond there and then” (Participant 12).*
A further use of LA for personal tutors was to use the data when there was a general concern about a student, otherwise they would not necessarily use it for checking weekly: *“I guess as a personal tutor, I tend to use it when I have concerns. And then I also tend to use it as a point of information for international students”* (Participant 6). On the dashboard, staff can select all students who are in red and use that data to trigger conversations and find out why the student has not been attending. This would fall into using it for interventions with students.

Questionnaire Responses from ‘Other’

By selecting ‘Other’, the questionnaire gave further responses and reasons for how staff are using the data as a PT. Although some PTs strongly indicated that they do use LA data as a basis for conversations with students, others stated that they did not use it (Figure

14). Negative responses included views such as "*I'm not sure what would be useful about it"* (Participant 5). This finding indicates that the participant does not wish to use the data as they do not believe it is useful to them in the personal tutor role. If a tutor does not find it useful, part of my role is to find out why and explain in more detail how that data works which can sometimes change the tutor's opinion.

Findings also showed that participants preferred to have a face to face approach with their personal tutees: "*I don't tend to use the data, as I tend just to discuss things with the student and ask them questions"* (Participant 11). The idea of Data Explorer is that it is viewed as another data tool and tutors should use it in addition to their knowledge of the student to gain a full rounded picture of why that student might be in danger of disengaging. Further findings from the questionnaire response of 'Other' further indicated that tutors are aware of using Data Explorer for this purpose as they see it "*as a prompt and evidence for conversations with students about whom I have concerns with engagement* " (Participant 6). Another participant described how the LA data helps them as they use it to: "*provide a holistic view of student performance and show how this offers an indicator for how they may need to improve*". (Participant 14).

Discussion

5.2.2 RQ2: How are PTs using the LA data in undergraduate courses?

The data revealed that the predominant way PTs use LA in undergraduate courses was to view a student's attendance and engagement data on Data Explorer. It was followed by using that data to prepare for PT meetings with students. This finding has importance for the use of LA data as it suggests that the data is being used for the correct reasons to an extent.

Many PTs were also module tutors so also used Data Explorer for taking attendance. The findings from the interviews indicated that PTs used the data as a basis for conversations with students (Chapter Five). Findings also indicated that although staff find the data as a useful basis for interventions with students, it can be difficult to navigate to areas they need as discussed in the findings.

The ways in which PTs do use the system can be compared to those identified in Krumm et al's (2014) evaluation of Student Explorer (see Chapter Two), an early warning system, similar to Data Explorer. Krumm et al's advisors stated that they used Student Explorer to identify the students who needed help and then they would work with those students to

improve their situation. The findings of this study (as described below) confirmed that PTs carried out both these steps through the combination of both the questionnaire and the interviews.

Other ways that PTs and students might interact with each other is when students approach the PT instead of the other way around. This could therefore be a further situation where the data is not necessarily used, depending on what the student needs a solution for. For this study, this situation was discovered via the interviews, rather than in the quantitative data and is an example of when the qualitative method can provide further insight than the quantitative method alone. The interviews established that tutors:

"certainly do find any student who has some particular physical or mental health issue, do speak to us and they do want us to know and quite often I find other students that come to us quite early on in the term and say I need you to know about this issue" (Participant 9).

In this scenario, students could ask their tutors about any aspect of their University lives, regardless if the PT is qualified in that area. The literature has stated concern around this aspect of the personal tutor role and the lack of research that currently exists (Chapter 2). The literature shows that there are times when students reach out to PTs (Seraj and Leggett, 2023) instead. Seraj and Legget, (2023) evaluated the role of the PT at a single institution which included examining a coaching approach for PTs. Both benefits and doubts about this process were identified in staff interviews. The study found that "the participants indicated students predominantly contact their PTs when they have problems and need to find a solution" (Seraj and Leggett, 2023, p95). The different ways in which PTs use LA at the UOG are highlighted in Figure 16.

The analysis of RQ2 has identified the different ways in which PTs use the LA data and it has also highlighted that there are some tutors who do not use the LA at all in their roles as a PT and any possible reasons for this. The data identified that PTs predominantly use it to check Attendance and mostly when they have concerns about students or a 'red flag' is raised. The thematic analysis for RQ3 is described in the section below.

5.3.1 RQ3: Analysis: Can LA re -establish student engagement post Lockdown? (2021 onwards)

During 2021, teaching was still largely online at the UOG and the hybrid teaching period was

for the academic year 2021-2022. Hybrid teaching refers to some courses being back to face to face or in workshops and others remaining in online teaching. During the hybrid period, the way Data Explorer was used differed slightly and part of my role involved sending out the comms for updates on this at the time. Instructions were posted on the internal Staff site and are as follows: *if you are using the system for students attending virtually via Teams, there will be an attendee list enabling a register to be completed manually. You can screen-share the code on Data Explorer or simply tell your students the code and they can check-in using their laptop or phone from wherever they are during the session*. If tutors were in class, then the normal method of accessing a pop up for Attendance capture on the workstations applied. The link in this pop up takes them directly to Data Explorer. The codes for this question were as follows: i) online teaching, ii). Student engagement and iii). Mental Health. Mental health refers to student wellbeing while student engagement refers to student interactions and participation with their courses, particularly their activity on Moodle.

Online teaching

Although most classes were still online during this time, the interviews revealed that some courses were able to stay on campus during the pandemic. These were courses with a more practical discipline such as Television and Health and Social Care so therefore issues with student engagement did not arise because very little changed for them. For example students could still attend workshops in a television studio as long as they adhered to pandemic rules of keeping 2 meters apart from each other (social distancing) and wearing masks. Other courses that were able to keep running included courses from Health and Social Care such as Nursing where students were working in the hospital environments.

Participant responses generally stated that students did not like online classes and it was much harder to keep them engaged or even know they were attending the lecture. One participant describes student attitudes to online learning:

> *"I'm not even there because I don't have to have my camera on or my microphone on, so there's no way of anybody actually checking if I'm actually there and I can just go and do whatever I want"* (Participant 8).

This would suggest that students do not believe their tutors monitored their attendance during the period classes were online and that they had freedom if they left their screen.

Another reason students would be reluctant to turn on cameras and answer questions is because they are being recorded so the level of engagement is not the same as in face to face classes.

Mental Health

A prominent factor that has further developed post pandemic is student wellbeing and mental health. This included worries for some about returning to campus to do face to face learning. A participant describes their experience of coming back to campus post pandemic as divided amongst students:

"*There were some who were very keen to come back in and some students who are still finding it really difficult to come back in and that kind of difference between those students is really kind of defining the groups' quality of work"* (Participant 8).

Another factor of mental health and wellbeing is that some courses might be more affected than others, particularly those that had to remain online for the full duration of the pandemic such as History and English. As one tutor explains: *"we have a high incidents of mental health issues in creative writing and always have done really, much higher than the average".* This could be due to the nature of the work for this subject which involves working more independently and individually and not always in groups. This factor could lead to an increase and exacerbation of any mental health issues that were developed before lockdown.

Student engagement

One of the key effects of lockdown and the pandemic is that it caused student engagement to be lost which is evident in the findings of the secondary data (particularly Figures 6 and 7) as there are lower figures of usage during the affected years. An important aim of LA is to provide students and tutors with the data they need to improve situations. Therefore, RQ3 divided opinion among staff where some thought that LA was useful in establishing student engagement post lockdown and others did not. However, the majority believed LA did help. One participant believed that the only way LA could help restore engagement "*is if you had like a specific reason why that attendance would have an impact if they did not achieve a certain percentage of attendance*" (Participant 9). The University's interventions process enforces this as students are emailed if they do not attend 10 to 20 sessions consecutively which can lead to University instigated withdrawal from their course.

A participant explained that they did believe the analytics were helpful in restoring student engagement: *"I think the short answer is yes…the main benefit is that for those students who are not attending, there is clear evidence and a clearer route to go down."* (Participant 6). Another participant further agrees that

"if you've got something that's actually monitoring the engagement, there's no getting away from the data and it does mean that for personal tutors, there is something to talk about (from the last two years) other than just a vague notion of attendance" (Participant 13).

One of the original aims of using LA at the UOG was to provide personal tutors with data that would allow them to make timely interventions and this quote would illustrate that this aim has been achieved. A tutor believed it has potential but put forward a suggestion on how using LA to help student engagement could be better:

"It has potential but not on its' own, you need a way to kind of take that data and put it into practice, which the engagement and attendance policy is trying to do but it's not doing it as well as it could be doing it." (Participant 7).

This suggests that although there are strategies and policies in place at the UOG to help with LA, there could be room for improvement to the processes.

In contrast, another participant believed that:

"I don't think establishing engagement has anything to do with the Learning Analytics in and of itself- there's nothing that the computer programme can do to make that better because it's about the person" (Participant 5).

Staff are encouraged to use the data as another tool in addition to their knowledge of the student to create a full picture of their attendance. However, limitations of using LA include that it does not explain why there are problems with a student's engagement, rather it indicates that they might need help but once a student is aware of their analytics, they could be motivated to change their behaviour and improve their engagement.

The analysis of this RQ has revealed that LA is a contributing factor to whether student engagement can be re-established post lockdown.

Discussion

5.3.2. RQ2: Can LA help re-establish student engagement post lockdown (2021)?

In order to determine whether LA can help re-establish student engagement post lockdown, secondary data sources from the IT department and Jisc were examined (Chapter Four). It was necessary to examine student engagement over time for this question to see if there were differences between the years post lockdown. Post lockdown refers to 2021 onwards. Student engagement in this context refers to the number of clicks on Moodle and the clicks represent the resources that are uploaded to individual Moodle sites (one per module). The years examined were 2021-22, 2022-23 and the start of 2023-2024. VLE usage is a key measure of LA and that usage contributes to the student's overall RAG rating. The other two most common measures are Attendance and Assessment.

Studies have reported that student engagement has declined over time (Boulton et al, 2019) as well as increases in mental health among students (depression and anxiety) especially during the first lockdown of 2020 (Evans et al, 2021). Boulton et al's (2019) results share similar findings with this study where the engagement declined over the Spring term and after critical months such as September. In September, students are enrolling in classes and it is the start of the course. Boulton et al debate reasons why this decrease in engagement might have happened such as students' assessments already being handed in towards the end of term so there is less need to engage.

One reason student engagement might have declined over time is due to mental health and wellbeing. This can be linked to whether students feel a sense of belonging at their University. The literature states that belonging "is a key factor in student retention" (Ahern, 2019, p168). Since 2021, Covid would remain a factor that changed student attitudes towards attending classes with some students having difficulty coming back to campus in the post lockdown period. The interviews established that students preferred face to face classes rather than online classes during the pandemic and hybrid teaching period.

The secondary data findings of student engagement post pandemic also showed that there were unusual spikes of activity which is in line with the literature (Figure 6). Figure 4 and 5 also indicated unusual levels of activity but this can be attributed to the pandemic. Studies indicate that if students are studying at different times of day or at unexpected times of the year, they might be feeling anxious about the course (Ahern, 2019) and would possibly be over-engaging by spending too much time looking at VLE resources. Ahern provides further

possible reasons for an increase in students accessing the library, stating that students may find that the library is a preferred place to study rather than in their accommodation.

There are differences in the literature when it comes to findings of student engagement during the pandemic. The findings from Zhang, Taub and Chen (2021) suggested that there was no significant difference to student engagement in Spring 2020 (during the first lockdown). Students were still able to access and complete their modules. However, the results of this study suggest that student engagement has increased since 2020- 2021, with this academic year facing the lowest student interactions in each figure. The lack of engagement for this year could be due to the possibility that by then there had been multiple lockdowns since Spring 2020 and motivation to engage could have decreased. These findings from Zhang, Taub and Chen (2021) were also for a course that was entirely online so there wouldn't have been a shift from face to face to online which is what students had difficulty adjusting to as they were for online learning modules (OLM).

5.4.1 Triangulation Results

As this is a mixed methods study, the rationale used to justify this use was the ability to triangulate. A comparison of the responses in the questionnaire to those in the interview (n=19 responses) was carried out to see if triangulation had been achieved and if participants said the same thing. The responses were compared in a spreadsheet to see if participants described the same challenge or benefit in both methods (for example). Responses came from the questions with written options in the questionnaire so the answers were qualitative. Some questions were asked in both the interview and the questionnaire. This was to gain more in-depth responses in the interview and to elaborate on the original answers from the questionnaire. Examples include 'how are you using LA in your current role?'

The use of both methods and the use of triangulation aimed to enhance the validity of RQ1 and RQ2. The aim of RQ1 was to find out what challenges were faced during the use of LA and the LA dashboard. The responses from the questionnaire were elaborated on in the interview which allowed for more flexibility as it meant participants could easily go back to a previous question and provide more information. The questionnaire highlighted those who were using the system and identified some tutors who did not use it. Tutors who participated in the interview either partially used it or fully used it. The interviews then further addressed why tutors did not use the system to its full purpose.

Both methods identified the same challenges raised and the results of the questionnaire analysis in Figure 11 (p76) show which was the most common challenge experienced. This was coded as Technical issues. Both these findings suggest that tutors are indeed using the dashboard but come across technical issues.

The aim of RQ2 was to find out how personal tutors are using LA in undergraduate courses at UOG. The combination of the two methods identified seven ways in which PTs used the LA data. A predominant reason in both methods was that they use it to prepare for conversations with students to find out why they are possibly disengaged with their course.

RQ3 aims to find out if LA can re-establish student engagement post lockdown and has been analysed in a different way to RQ1 and RQ2 as it was not included in the questionnaire. This was because the items required more elaborate responses and were not suitable for a Likert scale or multiple-choice question. Instead, it has been analysed using secondary data (see Chapter Four) and the interviews. The interviews revealed that the majority of participants agreed that the data was helpful in re-establishing any lost student engagement because it can be shown directly to the students, including any absences or lack of engagement with the VLE if they offer anything to the contrary. The quantitative data revealed an increase in student usage of LA since 2021 (including Study Goal usage and the increase of Helpdesk calls from students). The interviews complemented this due to the majority of participant responses stating that they believed LA can make a difference to restoring student engagement and that it is a useful tool to them.

Summary

The results showed that although staff find the LA data helpful and use the system, the issues raised can prevent them from getting the information they need in order to make decisions. Benefits of using the system were also recognised but not fully, indicating that although the UOG has made strategies and policies to promote LA, more work needs to be done to ensure it is used by all departments. Issues that affect the continued use of LA include technological, navigational and data accuracy.

Overall, it was established that tutors use LA in different ways when they are acting as a module tutor or personal tutor. Attendance emerged as the predominant way in which PTs use LA and it further proved that interventions are carried out by PTs rather than MTs.

The question of whether LA can help establish student engagement divided opinion

among tutors but the majority agreed that it can help those flagged as at risk turn their situations around. Secondary data was used to measure student engagement since 2021 and complements what the tutors said in the interviews.

In terms of providing empirical evidence to support LA, the figures that showed this were Figures Four, Five and Six. These all show an increase in the use of LA tools (Data Explorer and Study Goal), particularly Figure 6 which shows an increase in Moodle since 2021. This increase suggests that LA can support student engagement given that VLE usage is one of the key metrics LA is measured on. The increased number of Helpdesk calls in Four and Five would further suggest that LA tools are continuing to be used since 2021.

The next chapter presents the discussion and analysis of the quantitative findings.

CHAPTER SIX
QUANTITATIVE RESULTS

Introduction

This chapter presents the results from the questionnaire findings. Although the questionnaire contained open questions, these findings are presented in Chapter Five as they were analysed using a qualitative method.

6.1.1. RQ1. What are the benefits and challenges of using Data Explorer?

Challenges identified via the interviews and the questionnaire are i) Technical issues. Other challenges such as ii) Navigation of the Data Explorer system and iii) Data accuracy were primarily identified in the interviews (see Chapter Five). Benefits that were identified in the questionnaire include: *i). Ability to view engagement for all students, ii) Detailed at a glance graphs for attendance monitoring and iii) Flexible options with the registers.*

Figure 11: The types of challenges staff faced with using Data Explorer.

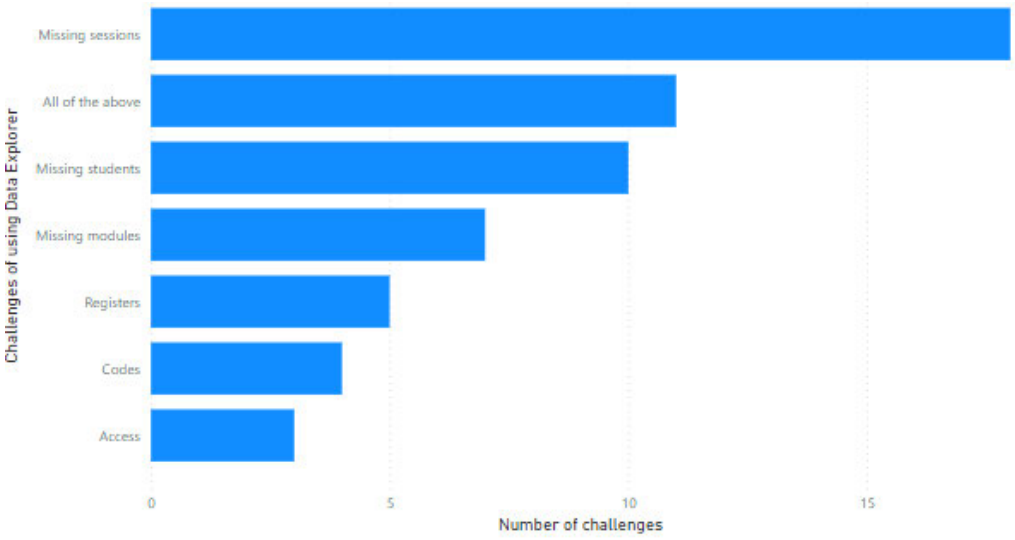


Figure 11 presents the result of the types of challenges tutors face. It also highlights that missing sessions is the most common issue that staff have been faced with. Again, a tally was carried out to see which challenge was referred to the most and that data was inputted to Excel to create the above bar chart. Further, the challenges were described in a table showing how helpful staff found Data Explorer (Table 3, p84).

Technical Issues

Technical issues as shown in Figure 11 above, are represented by *i) missing sessions, ii) missing students and iii) missing modules*. The other three issues can also be grouped under this challenge suggesting that the questionnaire's key findings in relation to challenges is technical issues.

Missing sessions refers to lecture or seminar events not showing up in that tutor's dashboard for that day. Missing modules refers to a module not showing up in the tutor's dashboard which also prevents them from accessing Attendance capture. Missing students refers to students who do not appear on the registers and therefore cannot have their attendance recorded. If any students/modules/sessions are missing from the dashboard or register lists, it impacts the recording of student attendance as it means tutors cannot carry it out live in the session as is expected. However, it is possible to record student attendance retrospectively if it cannot be done live during the day. If this step is not completed then it will appear as though the student has not attended. As per the new interventions policy of September 2023, if students miss 10 to 20 consecutive sessions then their PT receives an email informing them that the student might have problems with their attendance. For international students who study under a visa, it is three to nine consecutive sessions. There

are further concerns for international students due to attendance being linked to their visa requirements.

Table 3 (p84) shows how helpful staff find Data Explorer against how often they use it. These results were obtained from the questionnaire. The questions were on a Likert scale and responses ranged from 'Very helpful, somewhat helpful, neither helpful or unhelpful, somewhat unhelpful, very unhelpful.' Those who selected 'more than once a week' find the data 'somewhat helpful' or 'very helpful' indicating that if used on a regular basis tutors find it more effective. Those who used it 'once a week' or less largely selected negative options: 'somewhat unhelpful' and 'neither helpful or unhelpful' showing a correlation with frequency of use and attitudes to the tool. Of the total responses 70% (44 out of 63) were positive and the majority of tutors agree that Data Explorer is 'somewhat helpful' (n=34), suggesting that although it can provide them with what they need, there are issues attached as Table 4 (p85) illustrates. Table 4 (p85) combines how helpful staff find the data with the number of challenges identified in the questionnaire and interview.

Table 3: Impact Evaluation: Summary of how helpful staff find Data Explorer vs how often they use it

How helpful	Total	How often	Total
Neither Helpful or Unhelpful	8	More than once a week	5
		Once or twice a week	1
		Less than once a week	2
Somewhat helpful	34	More than once a week	10
		Once a week	6
		Less than once a week	13
		Once or twice a week	5
Somewhat unhelpful	11	More than once a week	6

		Once a week	1
		Less than once a week	4
Very Helpful	9	More than once a week	5
		Less than once a week	4
Very unhelpful	1	More than once a week	1
Total	**63**		**63**

Table 4: Impact Evaluation: How helpful vs challenges faced

Challenges	Total	How Helpful	Total
1.Missing sessions	16	Somewhat helpful	10
Missing sessions		Somewhat unhelpful	3
Missing sessions		Neither helpful or unhelpful	2
Missing sessions		Very unhelpful	1
2.Missing students	12	Very helpful	1
Missing students		Somewhat helpful	6
Missing students		Neither helpful or unhelpful	3
Missing students		Somewhat unhelpful	1
Missing students		Very helpful	1
3.Missing Modules	6	Somewhat helpful	3
Missing Modules		Very helpful	2
Missing modules		Somewhat unhelpful	1
4. Register code	5	Somewhat helpful	3
Register code		Somewhat unhelpful	2

5. Register Access	7	Somewhat helpful	3
Register Access		Very helpful	2
Register Access		Neither helpful or unhelpful	2
6. Taking Registers	7	Somewhat helpful	4
Taking Registers		Somewhat unhelpful	2
Taking Registers		Very unhelpful	1
7.All challenges	10	Somewhat helpful	5
All challenges		Somewhat unhelpful	3
All challenges		Neither helpful or unhelpful	2
Total			**63**

Table 4 (p86) shows how helpful staff find the data alongside the challenges faced. It indicates that although staff find the data 'somewhat helpful', the biggest challenge that is faced is that of missing sessions. This data was combined into a table to see if there was an association between attitudes and the challenges raised. The way Data Explorer works is described in Chapter 4. Three out of 63 who selected 'Very Helpful' also state that they have no real issues with the data while 17 out of 34 responded saying they found it 'somewhat helpful' but reported a challenge. The number of challenges selected is fewer for those who have selected that they find the data 'Very Helpful' or 'somewhat helpful' indicating that it is being viewed by staff with the aim of assisting students.

The results of the questionnaire shed light on the challenges raised by using Data Explorer. Participants were also asked what they believed the benefits of using the dashboard were. This gave mixed responses which are presented in Table 5 (p87) below. The three main benefits were given in the questionnaire and are: i) detailed at a glance graphs for attendance monitoring, ii) ability to view engagement with all students and iii) flexible options with the registers.

Table 5: Impact Evaluation: Benefits of Data Explorer

Benefit	No of participants	%
Detailed at a glance graphs	29	46

Ability to view engagement for all students	21	33
Flexible options with the registers	3	4
Other	10	16

The graphs allow tutors to view visualisations for each student and data at a module level. These should be used to see patterns and trends in the student data. The ability to view engagement for all students means that no student gets left 'under the radar' even if there are problems contacting them. The final option of flexible options with the registers was the least recognised, suggesting that tutors do not believe that the registers have flexible options or do not know that they do. The benefits of using the system are highlighted in training sessions which can sometimes change opinion once they are fully understood. The registers are flexible as they can be corrected at any time and viewed even if they have a status of 'Closed'. This status of 'Closed' is what has caused the confusion with registers and leads a vast majority of teaching staff to believe that the registers cannot be altered but it actually means that students can no longer check in after an hour. 'Detailed at a glance graphs' was selected the most followed by ability to view engagement for all students. The recognition of the graphs as the top benefit suggests that to an extent, the purpose of the LA data visualisations are understood.

RQ1 set out to identify the challenges faced by participants when using Data Explorer. Findings provided a total of 6 challenges and the questionnaire responses indicate that although staff use the Data Explorer dashboard, the challenges described above impact its use overall with some participants selecting using it less often than others. The data also provided responses to benefits of the system, which was the least recognised by staff, indicating that overall, they do not see it as beneficial.

Discussion

6.1.2 RQ1. What are the benefits and challenges of using Data Explorer?

RQ1 aimed to discover what challenges were present for academic staff who use LA as business as usual as part of their roles. Challenges of using LA were identified using semi structured interviews and the questionnaire (Figure 11, p76). The data from Helpdesk calls raised was also analysed to find out how frequently these challenges occur and where the peaks in the year are. Figure 12 (p77) reported a mostly positive response (70%) to using the tool, illustrating that these challenges can be overcome to ensure its' continued use.

The questionnaire showed that there was a total of six challenges which were coded as Technical Issues and the most common challenge for tutors was missing sessions on the dashboard. If these sessions do not appear on a tutor's dashboard then they cannot access attendance capture for that day and this therefore can lead to inaccurate data as the attendance needs to be inputted manually. To resolve these challenges, staff might report them to the Helpdesk (Figure 4 (p54) and 5 (p55). Figure 12 (p77) and 13 (p78) suggest that attitudes to technology affect how often the LA data is used for example those who selected 'more than once a week' also said it was 'somewhat helpful' indicating they are comfortable with the data. Further, these figures suggest that stakeholder buy in is still a challenge for the UOG in terms of increasing the use of LA data given that participants also selected that the data was not helpful. Overall, these findings suggest that it is necessary to increase staff knowledge around how to navigate the system and give explanations of what the data is telling them. There are opportunities for staff to do this by reading guides on the internal Sharepoint site, attending training workshops or booking a one on one session.

If an issue is reported to the Helpdesk, it is assigned to myself as the Learner Analytics Coordinator in the first instance. I investigate the issue using the internal Data Warehouse and if all appears correct on our side, I then raise a ticket to the Jisc Helpdesk who will provide us with further information. The Data Warehouse contains databases of staff and student data which are queried to locate the issue. Jisc will then act on their side or inform us that we need to perform a further task on our side to resolve the issue. This is usually pertaining to any missing sessions or missing modules as depicted in Figure 11 (p76). A further action by staff for missing modules is to make sure they have the module showing in their timetable.

A further situation that might arise is that staff are not able to capture the attendance at the time. In order to maintain accuracy of student attendance, it is possible to fill in the register manually at a later time and any duplications need to be rectified in order to prevent this. The registers contain an option of Not Required which does not impact the attendance one way or another. This solution is highlighted in training sessions.

In addition to the challenges raised in this study, there are also challenges reported by the literature (subsection 2.3) and one that is consistently recognised is stakeholder involvement (Alzaharani et al, 2023) and technological factors. Findings from Alzaharani are discussed in Chapter Five. While these factors are mostly associated with the adoption of LA (Gasevic and Tsai, 2017), the UOG faces the challenge of keeping stakeholder involvement ongoing

and an aim is to increase use of the system and raise awareness of what data LA can provide. Tsai and Gasveic (2017) report that Oster et al (2016) stated that teams who were based within technology showed a higher level of understanding than those who were not. Oster et al continue to say that there is a gap of understanding among stakeholders when it comes to LA due to its' technical nature and this is a finding shared with this study. Tsai and Gasevic conclude that this gap is a potential challenge for institutions to overcome in order to fully accept the use of LA.

Villagrán et al (2024) evaluated the effectiveness of a Learning Analytics dashboard (LAD). Similarly, they coded their data as 'Challenges of using the LAD' and found that this encompassed "LAD perceived difficulties and misunderstandings, including graphs, interpretations, finding specific information, and need for assistance." (Villagrán et al, 2024, p146). These difficulties can be compared with those found in this study under the technical and navigation issues raised.

Although ethical considerations is a challenge consistently reviewed by the literature, it has not been referred to by participants for this study. This is likely because overcoming this challenge pertains more to senior management or policy makers at the start of implementation. An ethical consideration comes in when staff request access to modules that they don't teach on. Settings in Data Explorer can help (as one grants them access to everything) but this is debated and dependent on the nature of the academic role and what they need it for.

The results of the questionnaire also identified the benefits of using the system and the options were selected across the spectrum – even from those who selected 'somewhat unhelpful' for the level of usefulness. The findings suggest that staff have recognised that there are benefits of using a dashboard, indicating that the implementation of the dashboard has been mostly received positively but not all of these have not been fully recognised. The benefits presented in the questionnaire were *i). Detailed at a glance graphs, ii). Ability to view engagement for all students and iii). Flexible options with the registers*. Flexible options with the registers includes the ability to be able to record attendance retrospectively.

Currently findings suggest that staff do not view the registers as flexible to use as it is the option that was recognised the least. This might be due to the confusion surrounding the two buttons used to run Attendance. One is for live Attendance and the other is Registers. Registers is the button to access past registers but the name of this has caused staff to think that it is where the current student register can be viewed. Attendance is the button used to

run the live sessions. This was reported as a concern to Jisc as part of stakeholder feedback and with the new interface launching in August, it is hoped that running Attendance will be a smoother task going forward allowing the full benefits of using a LAD to be recognised. Krumm et al (2014) found similar findings with their evaluation of Student Explorer where they discovered that their advisors did not see any additional benefits of using the system instead of carrying out their handwritten procedures of Attendance Monitoring. There is a similar attitude at the UOG whereby some staff still prefer to use paper registers over using the system but this then leads to the situation where students do not check in as no code is given.

By presenting challenges and their solutions (as well as any benefits) within an institution that has been using LA as business as usual for six years, this study could provide other higher education institutions (HEIs) looking to adopt LA with information on what sort of issues could occur by its' use and more specifically the issues that occur with using the Data Explorer dashboard. It can be concluded that these challenges prevent LA and the LAD from being used to their full potential.

6.2.1 RQ2. How are personal tutors using LA in undergraduate degrees?

The findings below show the results obtained from the questionnaire and how they answer the above research question. This section presents the results to RQ2 followed by the discussion.

Figure 12: Which part of LA tutors view most often

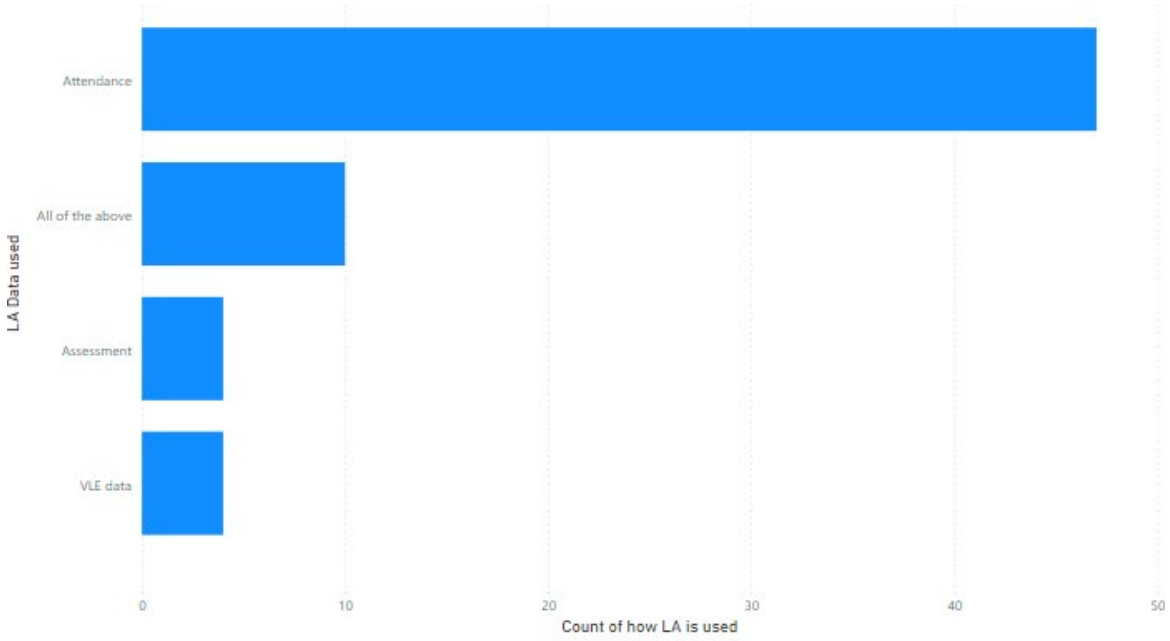


Figure 12 shows that the most common answer to 'which part of LA do you view the most?' was Attendance. 10 participants (out of 63) answered 'All of the Above' while the VLE and assessments have lower responses. 'All of the Above' refers to all three answers. This finding suggests that although staff predominantly use Attendance data, they do not view the data as much for the other measurements of LA. This could suggest that they are not aware the data for these measurements is available to them or are unaware of where it can be found in the dashboard. It could further suggest that Attendance is the most important out of the three measures and the one that has the highest level of consequences for students if they do not reach the 80 percent of attendance required. Figure 14 is a combined answer of responses from all staff.

Figure 13: Module tutors (MTs) use of the LA data.

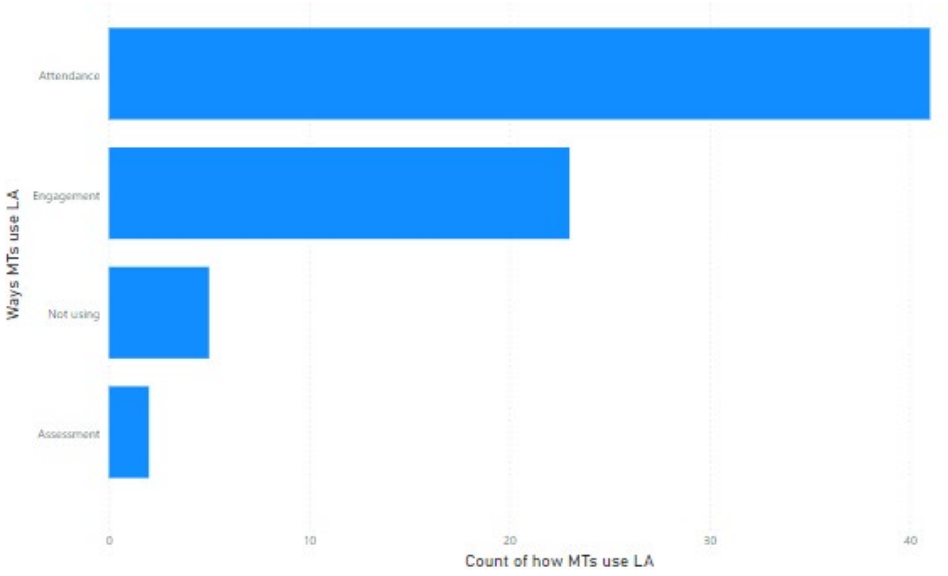
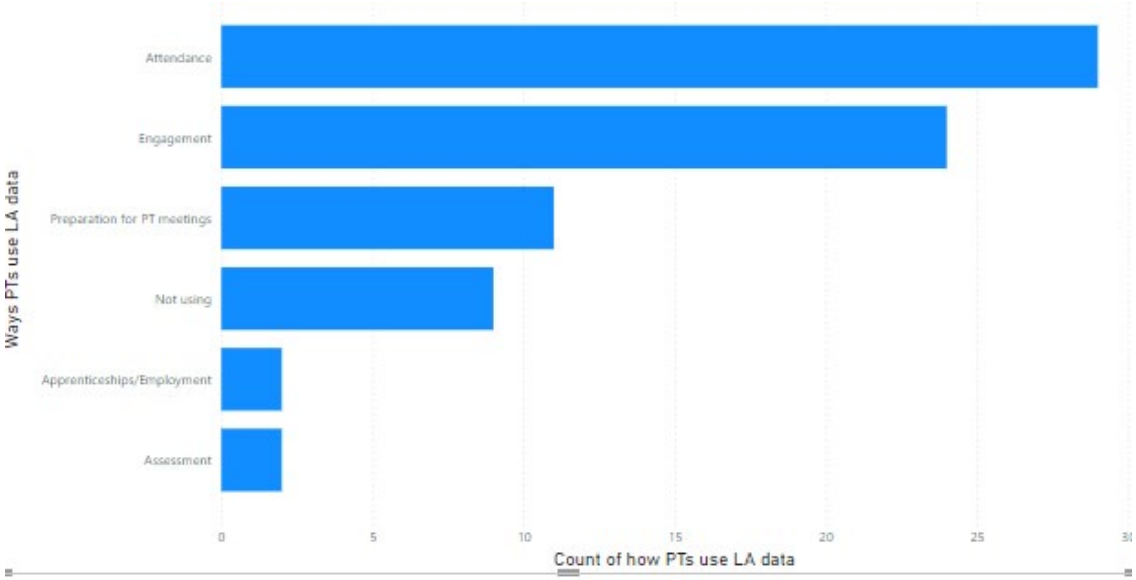


Figure 13 shows which part of LA module tutors (MTs) viewed the most and also identifies some module tutors who responded that they did not use Data Explorer in that capacity. Many staff were both a module tutor and a personal tutor and these results indicate differences between the two roles. MTs are assigned modules and are then given access to its' students and sessions which they can locate on the Data Explorer dashboard. Their tasks include taking Attendance and uploading resources to the VLE. MTs will also pass on concerns about a student to personal tutors (PTs). Once again checking attendance emerged as the prominent way in which MTs used the data. Other ways included tracking engagement via Moodle and viewing assessment data. The ways PTs use the data is described in Figure 14.

Figure 14: Personal tutors (PTs) use of the LA data



Source: Questionnaire results from MS Forms

Figure 14 shows how personal tutors are using the LA data. There were two other categories added to the spreadsheet to obtain this data. The first category was checking attendance for Apprenticeships (this is predominant among the School of Health and Social Care and the Business School) to then pass onto the student's employer. The second category is that PTs review the data before they attend their PT meetings with students so that they can use it as a basis for conversations with students. This further confirms that PTs use the data differently to module tutors (MTs). The graph also confirms that the most common concern PTs have is Attendance and highlights that some tutors do not use the data. Reasons for this included staff who were not a personal tutor or that they did not find the data helpful.

Discussion

6.2.2 RQ2. How are PTs using LA in undergraduate courses at UOG?

The quantitative data also established that PTs use LA differently to MTs due to the nature of their role and the interaction with students. The role of the PT generally assists students with all aspects of their university life and at the UOG, that role is also to carry out an intervention with students. Students can also see PTs as 'loco parentis'. Prior to 2023, PTs were solely responsible for the interventions process but when a new process came in in September 2023, their role changed so that they now receive an email from a system for students who have been flagged as not attending. They will then look at the student profile on Jisc and record whether that data shows if the student needed an intervention or not. These changes were applied due to the level of workload for personal tutors.

The finding that PTs use the LA data as preparation for meetings with their personal tutees was established from the questionnaire option of using 'Other' and then elaborated on in the interviews (Chapter Five). This finding has importance for the use of LA data as it suggests that the data is being used for the correct reasons to an extent and that the main aim of using it at the UOG has been achieved.

Figure 16 shows a total of 9 respondents (out of 63) who stated that they did not use the data. This was revealed by the questionnaire initially. Reasons for this included tutors who do not find it useful or prefer a face to face approach with students (Chapter Six). Part of my role was to review the usage of Data Explorer by academic staff and find out why it was low in some departments. This involved arranging discussions with academic course leaders to find out why and arrange follow up training sessions with relevant departments. Reasons for lack of use were because staff did not have access to modules, problems with cross teaching, lack of access to wifi or a computer in some rooms or simply because they did not believe it to be useful or wish to use the data. Following training, I would check the PBI report to see if the usage had increased which became the case for departments in Education and Health and Social Care.

Another reason for the lack of use could be attributed to the levels of knowledge of LA among staff as well as which courses they are assigned to. One participant explained that the reason they do not use the data is because:

> *"It doesn't show a very accurate picture of our students' attendance and we categorically need to gather this data accurately because they are apprentices"* (Participant 10).

Apprenticeship schemes at the UOG involve students working as part of their study and the required amount of hours is at least 30 per week. Apprenticeship students are required to carry out 6 hours of 'off the job' training which is then recorded in the new system, Aptem (launched in September 23) as evidence for their employer. It replaces the need to use the LA data in Data Explorer for Apprenticeships as it displays similar and more rounded information. The data in Aptem is then visible to everyone concerned with that Apprenticeship. This would suggest that the system is not reaching across to all areas of the University and is something that could possibly be expanded upon to ensure areas such as Apprenticeships are fully catered for.

Further findings concerned with the reasons why PTs do not use the system are similar to those discovered by Krumm et al (2014) in the evaluation of their LA dashboard, Student

Explorer (Chapter Two). A reason that their advisors gave for not using the system included that it takes time to learn how to use it and a lack of ability to interpret the data to make it meaningful for student discussions. These views are shared by the tutors at the UOG who believe Data Explorer is a time-consuming system to use and that the data is inaccurate. The study was carried out in two phases and after Phase II, Krumm et al found that the above issues reported by advisors did not reappear as they had worked with the advisors and provided training. It is hoped that with the launch of the upgraded Data Explorer dashboard that the UOG will achieve the same result and ultimately increase the usage of LA.

Summary

This chapter has presented the results of the questionnaire and the discussion of those results.

This chapter has discussed how the results answer the RQs and presents the information in the form of bar charts. It discusses the reasons PTs do not always use the system and the bar charts provide findings that show the differences between and MT and a PT's role with students. In relation to impact, it also highlights that Technical issues are a major challenge facing participants when they use attendance capture.

The next chapter presents the conclusion, limitations and further research recommendations.

CHAPTER SEVEN
CONCLUSION

Introduction

The aim of this thesis was to carry out an impact evaluation of the Learning Analytics (LA) programme at the University of Gloucestershire (UOG). This chapter will present the conclusion and will also provide suggestions for any future research.

The study aimed to answer the following research questions:

RQ1: What are the benefits and challenges of using Data Explorer?
RQ2: How are personal tutors using LA in undergraduate courses at the UOG?
RQ3: Can LA help to re-establish student engagement post lockdown (2021)?

The study also aimed to meet the following objectives:

RO1: To do a review of the current technology
RO2: To analyse how personal tutors use the LA data and explore how they carry out interventions
RO3: To analyse student engagement over time using secondary data sources.

Key findings Summary

The findings suggest that the challenges described for RQ1 do not prevent the use of Data Explorer (given that participants indicated they use it more than once a week) but it might impact it being used to its' full potential, particularly due to issues around data accuracy and missing sessions.

Tables 3 (p84) and 4 (p86) provided scatter graphs in an attempt to correlate how helpful staff found Data Explorer against how often they used it (Table 3) and what challenges were experienced (Table 4). The response to this in Table 3 was mostly positive (70%) and the majority agreed that the data was 'somewhat helpful' (n=34) suggesting that tutors use it correctly. In Figure 13, staff who responded with 'Very helpful' reported fewer challenges than those who said 'somewhat helpful' indicating that the more invested the staff member was in the tool, the more they were able to use all of its features effectively. These findings suggest that attitudes towards technology play a role in its use.

The data indicates that personal tutors (PTs) use LA in several different ways. It was highlighted that PTs are responsible for carrying out interventions for students and that is one of the primary ways they use LA data. The significance of this is that it suggests that LA is being used the correct way to help students who might need interventions.

It was discovered that the time of year makes a difference to student interaction with LA (Figure 6) - specifically student engagement- as well as to staff interaction with LA, particularly when they raise Helpdesk calls (Figure 4 and 5). This was where the secondary data was analysed as per Research Objective Three (RO3).

Findings suggest that the use of LA has been impacted by the pandemic, particularly during 2021-2022. This is due to the lack of usage for LA tools such as Study Goal and a limited number of Helpdesk calls during that time in comparison with the years following. The data further suggests that the use of LA is a contributing factor to an overall increase in student engagement post lockdown (September 2021 onwards).

Pragmatism theoretical framework

As mentioned in the Introduction, pragmatism is a paradigm that can be used by researchers adopting mixed methods. Paradigms contain the ontology, methodology and epistemology of each approach. Pragmatism was decided for this study because it is a flexible approach that is not tied to either one of the other paradigms (positivism and interpretivism). This flexibility allowed for multiple methods to be used within the study, therefore ensuring that the strengths of both approaches were used to answer the research questions.

7.1 Limitations

The following limitations have been identified for this study.

Student voice

Due to timescales it was not possible to include student opinions for this study. This therefore made the original objective for RQ3 redundant as it was to explore the student opinions of LA.

RQ1: What are the benefits and challenges of using Data Explorer?

It was not possible to measure the challenges against any demographic information

as this was not initially included. It was not included because it was not considered relevant to answering the research questions. However, this limitation was discovered later during analysis and there weren't many suitable variables to measure and perform correlational tests. Potential demographic data could have included age, gender and the School the participants were from. However, this still would only be applicable to answering RQ1, the only demographic data that would be used for RQ2 and RQ3 would be the School participants were from.

Generalisability

A further limitation is the generalisability of the study. Due to this being a case study of a single institution, not all findings can be generalized. Some processes (such as how to obtain the data) and statistics are UOG specific so cannot be generalized to wider research. If another institution uses Data Explorer then a similar type of evaluation could be carried out using those learning analytics but as previously mentioned, not all those universities utilise LA in the same way so it would look different.

7.2 Further research

The next step for a case study evaluation would be to partner with another institution that uses the same learning analytics and Data Explorer to compare the data and carry out a comparison longitudinal study. To build on this study, the comparison could also include the student voice.

Further Research at the UOG

The UOG is participating in the below project as part of our next steps.

Wellbeing Analytics

Going forward to the next academic year, the use of LA is currently being expanded at the UOG by partaking in Wellbeing Analytics. Wellbeing Analytics is a new area that is currently being developed at the UOG. Universities who have already established processes in this area include Northumbria University and Sheffield Hallam. Sheffield Hallam worked with TASO to produce a report on interventions by carrying out a randomised control trial (RCT) (see Introduction).

7.3 Conclusion

This study carried out an impact evaluation of Learning Analytics (LA) at the University of Gloucestershire (UOG). This was achieved by carrying out a mixed methods study which used qualitative methods (semi structured interviews) and quantitative methods (questionnaire). The total number of responses was 63 with 19 signing up to a follow up interview. The evaluation shows that staff and students are utilising Learning Analytics data and that it has moved from its initial implementation in 2018 to a successful 'business-as-usual' means to enhance the student experience. However, further action at the UOG is required to ensure the use of LA is sustained and continues to meet its original aims.

Since 2018, LA has moved successfully from pilot to business as usual but it is perhaps not being used to its full potential due to the challenges associated with its use (as was discovered in RQ1). However, despite these challenges, the data findings provide indicators that not only is LA being used at the UOG by both staff and students, it has contributed to an increase in student engagement between 2021 and 2023 (as data from RQ3 presents).

One of the original aims of using LA the UOG was to give data support to Personal Tutors (PTs) to inform their discussions with tutees, and to provide timely prompts for intervention (RQ2). The Learning Analytics policy states that the UOG will use LA to *"help meet a student-focused vision where, focus will be placed on challenging and supporting students to ensure they produce their best work"* (UOG, 2023, Learning Analytics policy). The data support was provided to PTs via the use of Data Explorer, an LA dashboard showing data visualizations of student engagement and attendance.

The use of triangulation in the study enhanced the findings after a comparison was done between methods. Both the quantitative and qualitative results suggest that LA has made a difference post lockdown. The quantitative data shows an increase in student engagement after 2021 – this includes Study Goal usage and VLE usage. The findings from RQ1 and RQ2 also showed that the methods reached the same conclusion for both research questions.

The results can be used practically to identify areas that require improvement or enhancement (in particular, the questionnaire results) in relation to training. The questionnaire results have flagged areas that need further attention such as a full recognition of the benefits and an increase in staff data literacy. However, as discussed in the

limitations, the results can only apply to the UOG.

This study contributes to the literature as it is an evaluation of LA as business as usual whereas many other studies discuss the implementation of LA at an institution. It also evaluates the use of LA and the LA dashboard, Data Explorer in post pandemic education whereas most other studies focus on the disruption during the pandemic. Further, it explores the role of the personal tutor in relation to interventions and LA data. Due to the launch of the new Data Explorer interface, it is hoped that the updated layout will increase usage. To sustain the use of LA at the UOG, it has been recognised that further support is needed for stakeholders, including training and awareness raising the benefits of using Learning Analytics.

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APPENDICIES

Appendix 1: Interview questions for Academic staff: Personal tutors

1.How are you currently using LA in your role?

2. What challenges have you experienced with using LA?

3. What solutions could be put in place to overcome these challenges?

4. In personal tutor meetings, do you use the LA data as a basis for conversation with students?

5. Do you believe LA is a useful tool for PT discussions?

6. If it is not useful, why not?

7. How are interventions carried out at UOG?

8. Once complete, how are interventions recorded at the UOG and what data is used?

9. What challenges have there been with student engagement post lockdown (from 2021)?

10. Have there been increases in student engagement post lockdown?

11. Do you think LA has the potential to establish student engagement?

Appendix 2: Research Ethics Committee approval letter

Dr Emily Ryall
Research Ethics Committee Chair
Reader in Applied Philosophy

Oxstalls Campus,
Longlevens, Gloucester, GL2 9HW

Tel: +44 (0)1242 715237
Email: eryall@glos.ac.uk

Via email

Jenny Fell
[redacted].glos.ac.uk

09 November 2023

Dear Jenny

Thank you for your application for ethical approval.

I am pleased to confirm ethical clearance for your research following ethical review by the University of Gloucestershire's Research Ethics Committee (REC).

Please keep a record of this letter as confirmation of your ethical approval.

Project Title:	'Impact evaluation of Learning Analytics (LA) at University of Gloucestershire (UOG)'
Start Date:	26 October 2023
Projected Completion Date:	31 August 2024
REC Approval Code:	REC.23.135.1

If you have any questions about ethical clearance please feel free to contact me. Please use your REC Approval Code in any future correspondence regarding this study.

Good luck with your research project.

[redacted],

[redacted]

Dr Emily Ryall
Chair of Research Ethics Committee

Appendix 3: Participant Consent form and Information Sheet

Information Sheet

As an impact evaluation, my research aims to evaluate the effectiveness of the implementation of LA and the impact it has had on the staff of the UOG who use it. As Learner Analytics Coordinator at the UOG, I am the first point of contact for LA. I lead on staff training of the system.

Description of the Procedure

This research is conducted as part of a postgraduate dissertation towards a Masters by Research degree in Education. The data will be anonymous and analysed at course level but will not include demographic data such as gender and age.

You will be given the following questionnaire to fill in followed by an invitation to participate in an interview and a participant debrief.

Description of risks

Research such as this has been conducted worldwide with no known negative effects. You can stop participating at any time.

Data collection and storage

All data will be kept securely in line with Data Protection legislation (digital information will be stored in a password-protected folder). You will be assigned a unique identifier to prevent personal details from being linked directly with your data. Your anonymised data will be combined with that of all participants in the study and this dataset will be available to the dissertation supervisor. All data collected from you will be destroyed in line with journal guidelines if the research is published in an academic journal.

To read more about the university privacy policy for research participants please follow this link: https://www.glos.ac.uk/docs/download/Privacy-notices/Research-Participants-Privacy-Notice.pdf.

Right to withdraw

Participation in this research is voluntary and you have the right to withdraw at any time including

up to two weeks after your participation by emailing [redacted]

Contact information

If you have any questions about the research, please contact the researcher, Jenny Fell: [redacted]

If you have any concerns about the conduct of the research, please contact my research supervisor Alex Masardo , at: [redacted]

If you wish to discuss the research with an independent p[redacted]

Consent Form:

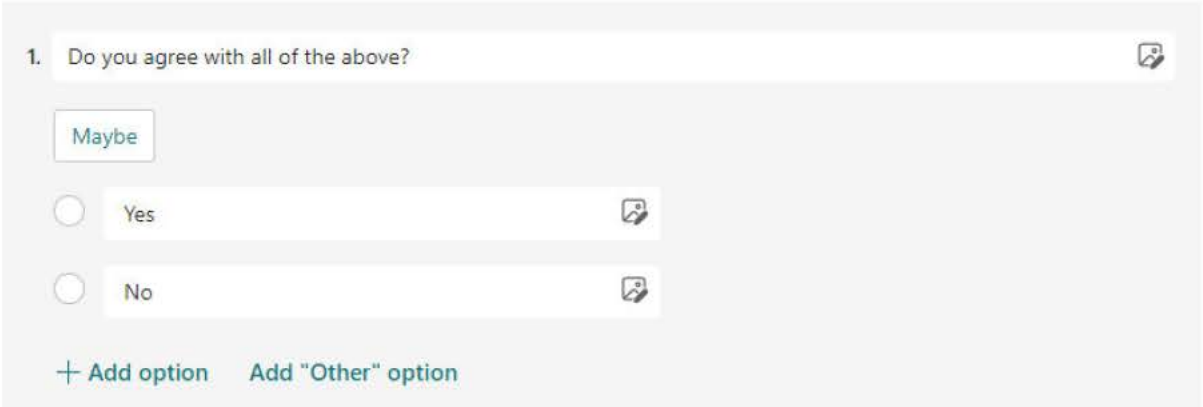
I have read the information sheet provided, and understand what I am required to do in order to take part in this study.

I have been advised of my rights as a participant. I understand that my participation within this project is voluntary. I understand I can withdraw at any point whilst the data is being collected and up to two weeks afterwards.

I have had the opportunity to ask questions before consenting to participate in the study and am satisfied with the information provided either through the information sheet, or from adequately answered questions to the researcher.

I confirm that I am over 18 years old; that I consent to allow the answers I provided to be included in the analysis and reporting of the study, including potential publication; and that there is no reason why I consider myself unable to take part.

Participants were then asked whether they agreed:



Appendix 4: Debrief Form

Thank you for your participation.

This research involved carrying out a questionnaire for Learning Analytics and the use of the Data Explorer system. The data was collected to gather people's experiences of using Learning Analytics (LA) at the UOG with the purpose to then carry out an interview.

The participants were sent a consent form including right to withdraw at any time and full descriptions of the project.

The data you have contributed will form part of a larger dataset and will remain anonymous and confidential, therefore your data will not be analysed individually and findings will not be traceable to you as all data will be assigned to a unique identifier rather than your name or any other personal identifiable information.

All information will be kept securely and processed in line with the University of Gloucestershire ethical guidelines and personal information processed in compliance with data protection legislation. To read more about the university privacy policy for research participants please follow this link:https://www.glos.ac.uk/docs/download/Privacy-notices/Research-Participants-Privacy-Notice.pdf.

If you would like to withdraw your results please email the researcher your pseudonym or unique identifier and ask to withdraw your data. You may withdraw your data up until two weeks after taking part – any requests to withdraw after this time may not be actionable as the data may already be pseudo- anonymously entered for analysis.

You are reminded that all precautions have been taken to protect you, however, if you wish to gain additional help or support after the completion of this study please contact your GP.

If you have questions about the research, then please contact the researcher, Jenny Fell: [redacted]