

Click, Submit, Repeat: What Moodle Analytics Reveal about Student Platform Behaviour in Professional Policing Education**Nick Louis**

Cardiff Metropolitan University

nlouis@cardiffmet.ac.uk

DOI:10.70386/ijcpe.v1i1.46

Abstract

The study is an observation of student engagement with the virtual learning environment (VLE) Moodle on a professional policing degree at a university in Wales. The purpose of the study was to examine how students engage with the VLE throughout their education journey across all three-year groups of the professional policing degree. The study used existing non-identifiable Moodle engagement analytics to examine how many times students accessed specific resources on Moodle. The study effectively found that, across the three-year groups, engagement was focused almost exclusively on the assessment submission and assessment resources. This was especially true during peak assessment times. The study aims to highlight this as a potential issue in policing and higher education, and to improve the effectiveness of VLEs in policing education.

Keywords: *Police Education, Virtual Learning, Higher Education and Policing, Police Professionalisation, Student engagement*

Introduction

The Police Education Qualifications Framework (PEQF) draws on education, critical thinking, evidence-based practice, professional development, and reflection ([Ramshaw & Soppitt, 2018](#); [Martin, 2022](#)). Indeed, the College of Policing (College of Policing) has sought not only to cement this relationship between the police and higher education since its inception in 2012 ([House Affairs Committee, 2016-2017](#)). The College of Policing considers this fundamental, as an officer should be challenged to use the 'best available evidence' to inform and challenge policing policies, practices, and decisions ([College of Policing, 2026, para 1](#)). This is necessary because officers should be encouraged not only to question existing practices but also to use their own decision-making and critical reflection to improve their abilities, again something the PQEF strongly encourages ([College of Policing, 2020](#)).

This specific issue is directly relevant to professional policing education. Unlike other courses in higher education, Professional Policing Degree (PPD) programmes are designed not only to foster academic development and understanding but also to prepare students for the reality of a profession in which evidence-based practice, continuous professional development (CPD), and digitally enabled learning are expected by the [College of Policing \(2026\)](#). The National Police Chief's Council (NPCC) set out in their 2025-2030 National Policing Digital Strategy that digital knowledge, data literacy, and technology are central to the future of policing. In a policing education context, this presents a prime opportunity to examine how PPD students use digital technology in their undergraduate degree programmes, typically through a virtual learning environment (VLE). One such VLE is Moodle, the Modular Object-Oriented Dynamic Learning Environment ([Perez-Perez et al., 2020](#)). Moodle has become one of the dominant VLEs used in higher education, serving as the main interface through which students access teaching materials, assessment information, feedback, and broader modular content ([Browne et al., 2006](#); [Perez-Perez et al., 2020](#)).

VLEs have become an accepted part of contemporary higher education. Indeed, it would be difficult to think of a university without some form of digital learning environment to support students and staff ([Browne et al., 2006](#); [Kirkwood & Price, 2014](#)). While early VLEs began as repositories for lecture notes and announcements, their roles have expanded considerably over the last few decades to include

assessment submissions and even whole programmes (Perez-Perez et al, 2020; McGuire, 2026).

However, this raises an important question around the widespread adoption of this VLE. If VLEs are now integral to higher education, are students engaging with the breadth of resources they contain, or have they become little more than an assessment management system? Existing research typically focuses on how VLEs improve learning, student satisfaction, or, critically, education outcomes (Kirkwood & Price, 2014; Perez-Perez et al., 2020). Likewise, close attention has been paid to the general acceptance of technology, online pedagogy, and the design of digital learning (Davis, 1989; Laurillard, 2002; Salmon, 2013). However, less attention seems to be given to the day-to-day behavioural patterns that emerge once a VLE is part of normal university practice.

The question stems from repeated observations with an undergraduate PPD programme at a Welsh university. Teaching teams have noted that students access assessment briefs, submission portals, and assessment guidance substantially more frequently than course materials, supplemental resources, and asynchronous content. As such, this study contributes to the wider discussion concerning learning analytics while offering one of the first studies to examine behavioural patterns within a PPD programme. Ultimately, the study asks if PPD programmes continue to use and invest substantial resources in VLEs, and whether students are using them effectively.

Literature Review

Understanding Student Behaviour in VLEs

VLEs are now an established element of higher education and have become part of our teaching practice. In a policing context, understanding PPD students' behaviour in using their institutional learning platforms is more than a question of educational design and general digital learning; it also relates to a broader discussion about preparing PPD students for the practicalities of a rapidly expanding digital policing world. From an HE perspective, there is a clear cultural transformation in HE. However, institutions should see this as more than the adoption of new technologies; it is an opportunity to improve educational practice and pedagogical design, collectively enhancing how students engage with digital learning (Böhmer et al., 2024).

Therefore, this review of the relevant literature examines student behaviour in relation to their use of VLEs.

VLE Purpose and Evolution

The use of virtual learning could easily be mistaken for a very recent method of delivery. Indeed, the use of VLEs such as Blackboard or Moodle seems to be part of everyday HE. The introduction of electronic communication, such as email and chat rooms, has been central to electronic communication ([Salmon, 2013](#)). However, growth in online learning environments in HE has accelerated significantly since the 1990s ([Kirkwood & Price, 2014](#)). As such, these platforms enable students to personalise their educational experience while maintaining control over it at their own pace ([Salmon, 2013](#); [Weller, 2020](#)).

Institutional infrastructure quickly evolved in the early 1990s and 2000s, with large investment in digital technology ([Browne et al., 2006](#)). [Browne et al. \(2006\)](#) describe this as one of the most significant periods of institutional expansion, with VLEs forming resource distribution networks, improving communication, and becoming central to teaching administration. At the same time, [Laurillard \(2002\)](#) argued that learning technologies should extend past content delivery and support dialogue, interaction, and strong reflective learning practice between students and educators. Indeed, this ambitious pedagogy remains central to many ongoing discussions surrounding digital learning and, arguably, learning in general. In other words, technology should support learning by enabling students to actively engage with educators and their knowledge, and with one another, rather than simply absorbing what is provided. However, there is research to suggest that some early systems were not pedagogical innovation but administrative systems ([Lonn & Teasley, 2009](#)). As such, concerns remain as digital technologies become more embedded within higher education. [Naimi-Akbar et al. \(2024\)](#) argued that as VLEs expand in HE, there is a tendency for transmission-oriented approaches to replace traditional teaching methods, which fail to capitalise on the pedagogical opportunities of VLEs.

Still, as often happens, technology can outpace the venue in which it is applied. This is especially true in an educational setting ([Laurillard, 2002](#)). Nevertheless, there remain debates about whether technology-enhanced learning is truly making an impact on education or is nothing more than institutions digitising their materials

(Kirkwood & Price, 2014). In fact, this could be seen as a common pitfall of VLEs, as McGuire (2026) further noted that VLEs often fail to fulfil their pedagogical functions, becoming repositories rather than tools for active learning.

This interpretation challenges the norm that students will adopt a VLE intrinsically, based on the belief that it will help them learn. Rather, it suggests that without a purpose underpinned by a strong pedagogical design, the platforms do little more than digitise existing teaching and learning (McGuire, 2026). This means that whilst the capabilities of VLEs continue to evolve, there remains less agreement on their educational purpose and further questions about how students engage with them as a learning resource.

Explaining Student Interaction with VLEs

There seems to be a lack of agreement on why students choose to engage with VLEs, despite VLEs now being a critical part of HE. In the seminal work on the Technology Acceptance Model (TAM), Davis (1989) proposed that when technology is adopted, this usually centres on whether the technology is perceived as useful and easily accessible. Arguably, if students believe that their technology supports their learning or academic objectives (e.g., passing an assessment) and requires little effort, the TAM becomes apparent, as they see it as necessary for academic advancement and graduation.

Unlike other areas where technology might facilitate work, the use of VLEs is compulsory in HE. This makes their use necessary even if their usefulness is not fully understood by students or teaching staff. There are still questions about VLE flexibility, especially in HE, and about the introduction of new technologies (e.g., AI), and where this sits with existing pedagogy or even student engagement. As it stands, there is an argument that flexibility and accessibility in VLEs are core strengths of online learning. Still, this remains a challenge because student motivation and engagement can be difficult to sustain (Montenegro Rueda et al., 2024).

Conversely, VLEs can also create a sense of information overload due to institutional requirements that the platform has specific information. Deng and Tavares (2013) found that students see VLEs as cumbersome and sometimes very difficult to navigate. Indeed, there is evidence that inconsistent module design, coupled with a poor user interface, can leave students feeling overloaded due to the disorganisation

of the VLE (McGuire, 2026). In turn, as McGuire (2026) highlighted, it can reduce engagement because the platform is not an effective learning space and is not necessarily seen as useful to a student's academic advancement. Additional complications can also be considered since students engage differently with different resources. Weaver et al. (2021) argued that while students' assessments improved with self-directed use of a VLE, there was low engagement with other materials on the platform. This is critical as it suggests that a student will interact with the VLE but only to the extent they find a use in a specific resource. In turn, this means that such activity (i.e., recorded interactions) should be considered with the type of resource engaged with by the student.

This links directly to the pedagogy underpinning online learning. For meaningful learning to take place, there needs to be strong interaction, knowledge scaffolding, and dialogue supported by institutional feedback (e.g., from lecturers) (Laurillard, 2002; Salmon, 2013). However, a more complex argument is that students should take a more active role in their educational journey. Certainly, Guàrdia and Maina (2018) challenge this notion that education is a one-sided effort and that students should take an active part in their learning journey. This is critical when considering learning analytics and why students choose to engage with different elements of a VLE.

Learning Analytics as a Behavioural Lens

As VLEs have evolved into more sophisticated tools, institutional learning analytics have become one of the primary ways universities seek to understand student behavioural patterns, especially around engagement. Learning analytics involves the collection, measurement and analysis of data generated through students' interactions with the digital system to understand and optimise learning (Siemens & Baker, 2012). However, unlike more traditional education research, which often relies on surveys or self-reported engagement, learning analytics offers an opportunity to observe recorded behavioural patterns across entire cohorts over time.

VLEs such as Moodle, Blackboard, and similar platforms routinely record page views, downloads, assessment submissions, resource access, and navigation patterns. These analytics have given universities a unique position, as opportunities are now emerging to examine how students use digital spaces beyond what a lecturer

can see in the classroom. For example, [Dascalu et al. \(2021\)](#) showed how VLE data can reveal patterns of online participation before and during the COVID-19 pandemic, highlighting behavioural trends that might otherwise go unseen. Still, caution is warranted when interpreting this type of data.

Arguably, learning analytics, as a recording system, could also be one of the main limitations when considering this type of data. There is a risk that the technology itself creates an illusion of precision rather than identifying complex learning behaviours ([Selwyn, 2022](#)). Further to this point, in a systematic review of learning analytics interventions, [Pan et al. \(2024\)](#) found that behavioural analytics are becoming more sophisticated but have limitations in interpreting digital activity as evidence of more sustained learning.

However, that does not mean this data is invalid or unimportant for further study. There is a case to be made that more nuanced interpretations of these institutional analytics can yield rich information. [Siemens and Baker \(2012\)](#) considered a similar question; still, they argued that such information can be important when other factors (e.g., pedagogy, assessment structure, and curriculum design) are considered alongside the analytical data. This makes learning analytics more valuable because it measures learning more directly and provides insight into the behavioural patterns that can be examined through established educational theories. Thus, the objective is not to assess whether students have learned, but to examine how they interact with different categories of resources and to consider what these behavioural patterns might reveal about the role of a VLE in Professional Policing education.

Professional Policing – The Educational Context

There remains a large body of research on VLEs, and it has expanded significantly over the last few years, especially post-COVID. However, the extent to which this type of research situates itself within the context of Professional Policing education is less overt. This is a critical omission because policing, as a discipline, is not like other subjects taught at the university level. There are considerable objectives that must be set out (e.g., College of Policing requirements, NPCC, or force-specific knowledge), as well as educational objectives that are part of degree expectations (e.g., academic skills, passing coursework, attending lectures, etc.). Furthermore, PPDs are, in a way, vocational, preparing students for operational policing through

rigorous programs that focus on academic knowledge, reflective practice, and evidence-based decision-making in a policing specific context.

In this regard, the PEQF demonstrates a strong shift from policing as a vocation to one strengthened by formal education in, HE ([Ramshaw & Soppitt, 2018](#)). Historically, policing has relied on experiential learning and occupational socialisation; contemporary policing now expects its officers to critically engage with research and evidence-based practice to undertake CPD and adapt to evolving operational environments ([Martin, 2022](#); [Rogers et al., 2022](#)). As such, university education should develop a future officer's academic capabilities and impart the skills for reflective and analytical practice that they will use throughout their policing career.

As stated above, the National Policing Digital Strategy 2025-2030 reflect these significant developments, especially with respect to digital literacy. The strategy focuses on technological competence and confidence as part of the overarching competencies for policing, and it argues that police officers must be proficient in navigating digital systems, interpreting information, and willing to engage with technology across their careers ([NPCC, 2025](#)). In turn, it is argued that digital learning is not just an adjunct to professional practice. Still, it is essential to workforce development, supporting organisational learning, improved operational effectiveness, and evidence-based policing ([NPCC, 2025](#)).

The NPCC is not alone in this endeavour. Indeed, the [College of Policing \(2010\)](#) has increasingly framed CPD as part of a police officer's career and lifelong responsibility. Officers are expected to engage with professional learning through blended approaches that combine their formal education with operational experience, reflective practice, and, critically, digital learning ([College of Policing, 2010](#)). Arguably, in this context, VLEs serve a broader function than merely being repositories for undergraduate degree programmes. They are introducing future police officers to patterns of independent digital learning that will mirror the professional development expected of them in the field.

Still, there is a lack of empirical research on how professional policing students engage with their institutional VLEs. While existing studies such as those by [Kirkwood & Price \(2014\)](#), [Pérez-Pérez \(2019\)](#), and [Rapanta et al. \(2020\)](#) focus on learning outcomes, online pedagogy, and the acceptance of technology, more evidence is

needed to consider how recorded patterns of platform behaviour within professionally accredited PPD programmes are taking place within digital resources that reflect the expectations of the profession and within policing education. Undeniably, if students are only accessing assessment-related materials while failing to engage more meaningfully with broader learning materials, questions arise about how effectively institutional VLEs support the development of the learning behaviours expected of a well-prepared, evidence-based policing officer. If digital engagement is reactive and assessment-driven in undergraduate study, there may be implications for how a university designs its VLE to support best both academic learning and the long-term development of its professional policing students.

Addressing the Gap

The existing literature paints a clear picture of VLEs becoming integral to HE. Still, there is considerable debate surrounding how students engage with these platforms once they have become embedded into university practice. The existing research suggests that interaction is influenced by multiple interconnected factors, including acceptance of the VLE, its usability, the broader patterns of digital behaviour, and, indeed, the platform's pedagogical design. Alongside this are analytics that track platform usage. These have become a valuable tool to see recorded patterns of platform activity, while noting that behavioural data cannot determine educational engagement or learning outcomes on its own.

However, two gaps remain because, as it stands, there is little research on Professional Policing education and the use of VLEs in this context. This is concerning given that the NPCC has stressed the need for better digital literacy with all officers and the College of Policing considers digital learning central to an officer's CPD and evidence-based practice ([College of Policing, 2010](#); [NPCC, 2025](#)). Second, the existing literature focuses on technology adoption and educational outcomes rather than on how students use different types of institutional resources, as inferred from behavioural analytics.

Therefore, the present study seeks to address these gaps by examining how recorded Moodle analytics for PPD modules at Levels 4, 5, and 6 can be used to inform understanding of student behaviour within VLEs and professional policing education. In doing so, the study expands the debates around digital engagement

within HE and looks to discussions regarding professional readiness, digital literacy, and evidence-based policing.

Methodology

Research Design

The research is designed to be observational, non-experimental, and relies on secondary data analysis of student use of a VLE, specifically Moodle, at a university in Wales. It examined recorded patterns of VLE platform usage across all undergraduate PPD modules to identify how students interacted with different elements of the VLE over the course of an academic year. The study was informed by existing approaches to learning in higher education that focus on learning analytics research, which recognise that institutional analytics provide valuable insight into observable patterns of digital behaviour while acknowledging that such data cannot directly measure educational management or learning outcomes ([Siemens & Baker, 2012](#); [Dascalu et al., 2021](#)).

Theoretical Positioning

Three complementary perspectives underpin the study. First, the Technology Acceptance Model (TAM) provides a framework for understanding why students may choose to access a specific area of a VLE, particularly where resources are perceived as useful or essential to successful assessment completion ([Davis, 1989](#)). Other perspectives include theories of digital pedagogy that focus on meaningful engagement and purposeful activity, which help explain why students behave in certain ways on VLEs ([Salmon, 2013](#); [Rapanta et al., 2020](#); [Laurillard, 2002](#)). Lastly, learning analytics are the methodological lens that shows how recorded platform behaviour can be used ([Siemens & Baker, 2012](#)). Taken together, these perspectives allow observed Moodle usage to be interpreted within its wider educational context while still recognising that recorded use should not equate to learning or educational engagement.

Study Context and Dataset

The study's focus is an undergraduate PPD aligned with the College of Policing and the PEQF. Data are taken directly from Moodle from all modules in the current

academic year, 2025-26. In total, data were collected from six 20-credit taught modules at Level 4, six 20-credit taught modules at Level 5, and four 20-credit taught modules, plus the dissertation module (40 credits), at Level 6. The overall sample is (n=146) with Level 4 = 66 students, Level 5 = 42 students, and Level 6 = 38.

Table 1: Overview of the Dataset

Academic Level	Modules	Students (n)	Academic Year	Moodle Template
Level 4	6	66	2025–26	Standardised
Level 5	6	42	2025–26	Standardised
Level 6	5	38	2025–26	Standardised
Total	17	146	2025–26	

Each modular Moodle page follows the institutional standard template requiring pages to have specific areas of assessment guidance (e.g., assessment briefs and supporting materials), submission portals, weekly teaching materials (e.g., lecture and seminar slides, formative tasks, seminar worksheets, etc), and supplemental learning materials (e.g., reading lists, videos, useful links, podcasts, etc). The dissertation Moodle page retains a similar structure, except it lacks the weekly teaching materials.

Moodle Analytics & Data Categorisation

The data for this study were taken from Moodle's own reporting system. The system recorded usage or a 'view' within specific areas of each module's page. This includes assessment briefs, submission points, taught content, asynchronous content, module information and useful links, and supplemental resources (e.g., reading lists). The type of information used in the study is the system's record of a 'view' when the student clicks the resource tab. Thus, the analytics used in this study are representative of recorded interactions, not specific users.

Data Analysis

The study used a descriptive analytical approach. This involved calculating the total recorded views for one of the five categories and aggregating the numbers; comparing these across the three academic levels; examining temporal engagement with the resource categories across the academic year; and creating a visual representation using descriptive figures. The objective was to identify trends in recorded VLE behaviour rather than to create a predictive relationship between students' Moodle activity and their academic performance.

Trustworthiness and Limits of Moodle Analytics

Institutional learning analytics provide an objective, observable record of platform interactions. Therefore, it avoids many of the biases associated with self-reported questionnaires or retrospective interviews. Still, Moodle analytics have some limits in this regard. First, as stated previously, the interactions with the VLE do not determine if meaningful learning is taking place. Additionally, there is no way to show whether a student has downloaded the material for offline use, whether learning is taking place offline, or whether a student is using another digital platform (e.g., College of Policing resources). Critically, it also does not indicate whether the recorded interaction is general navigation across the VLE or genuine engagement with the materials.

Ethical Considerations

The study was approved under the relevant university's ethics approval process. No participant information was collected, and all data were collected in accordance with the relevant university's data protection guidelines.

Results

Moodle analytics were gathered across the university's PPD from all modules in all three academic year groups. The data were aggregated by resource categories and examined descriptively to identify patterns of platform activity. Results are presented by engagement by resource, an engagement funnel showing the distribution of activity across resources, and temporal engagement for the resource type. Figures represent aggregated Moodle interactions. Multiple interactions from

the same user may generate further interactions and therefore represent activity rather than specific students.

Level 4 (First Year)

The activity recorded in Level 4 was focused on assessment and submission. The other categories recorded far fewer interactions.

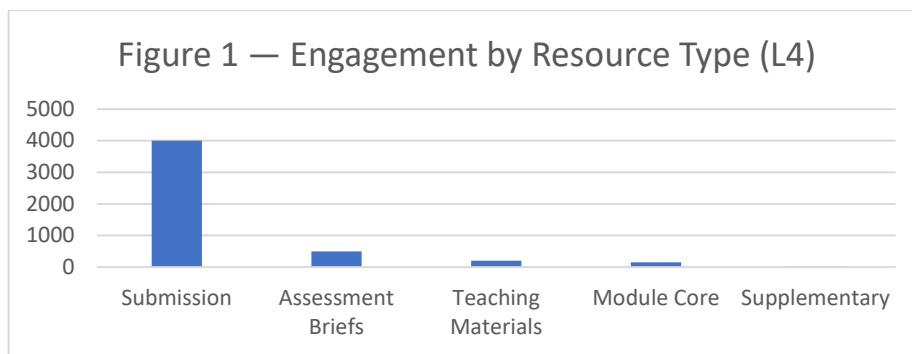


Figure 1 shows that assessment resources generated considerably higher levels of recorded activity than the other resources. In this case, more than 4,000 interactions related to assessment activities were recorded. The difference was consistent across all modules analysed at Level 4. Lecture slides recorded moderate activity, while asynchronous material and additional readings accounted for comparatively few interactions, attracting around 250 views for modular and teaching materials.

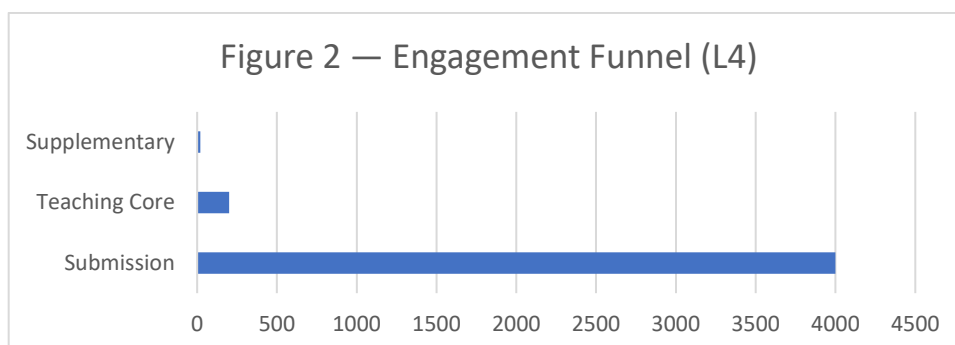


Figure 2 shows the engagement funnel. This shows how recorded activity progressively narrowed across the resource categories at Level 4. Most of the activity centres around assessment-related categories, with far fewer supplemental resources showing activity. The distribution is consistent across all the modules.

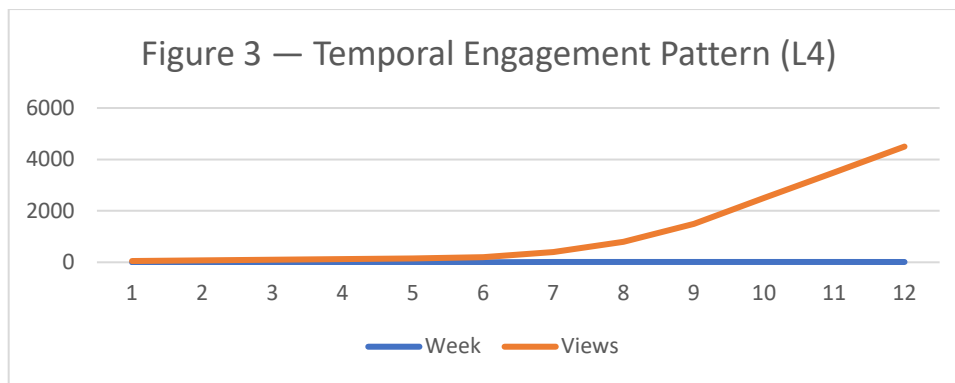


Figure 3 is illustrative of temporal engagement with the resources over the course of a 12-week semester. Moodle activity remained relatively modest throughout most of the teaching weeks. However, there was a notable increase in weeks 6-7 and 11-12 as the mid-module and end-of-module assessment dates approached.

Three general patterns emerged from the Level 4 data. The assessment-related resources had the most interactions among the platform's activities. The other recorded interactions declined progressively across teaching materials and supplemental learning resources. While activity did fluctuate some over the semester, the highest recorded interactions were centred around assessment times.

Level 5 (Second Year)

The Level 5 Moodle analytics showed a similar activity record to that of the Level 4 modules, with most interactions focusing on submission and assessment-related activities.

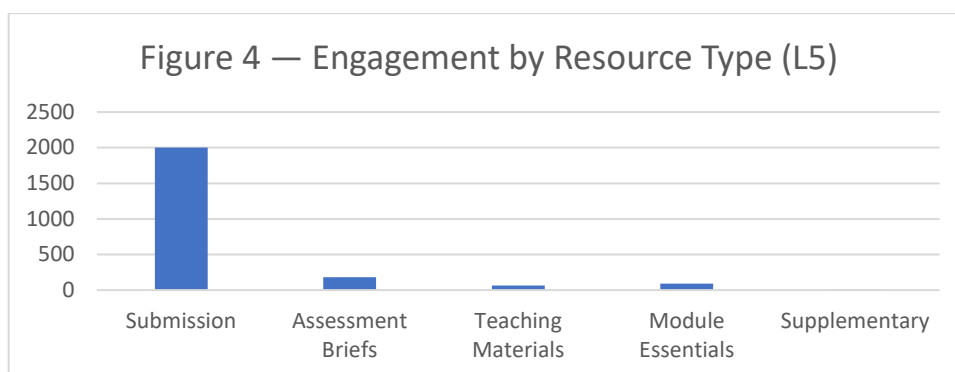


Figure 4 shows that submission portals generated the most interactions across modules, with approximately 2,000 interactions across the cohort. Assessment briefs recorded the next-highest level of interactions, with around 250 views. Other

resources had considerably fewer interactions, and in some cases, no activity was recorded.

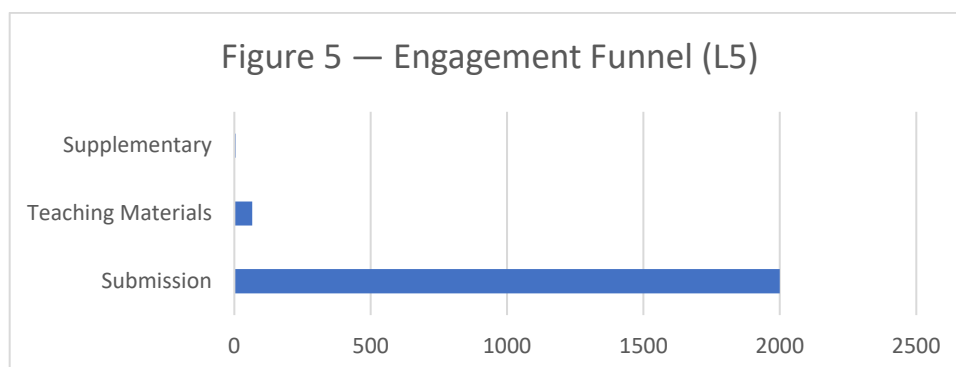


Figure 5 shows a reduction in recorded activity as resources became less closely related to assessments. Assessment-related materials accounted for the largest share of activity, while teaching materials generated far fewer interactions. The fewest recorded interactions were in the supplementary materials, and this was the case across all modules.

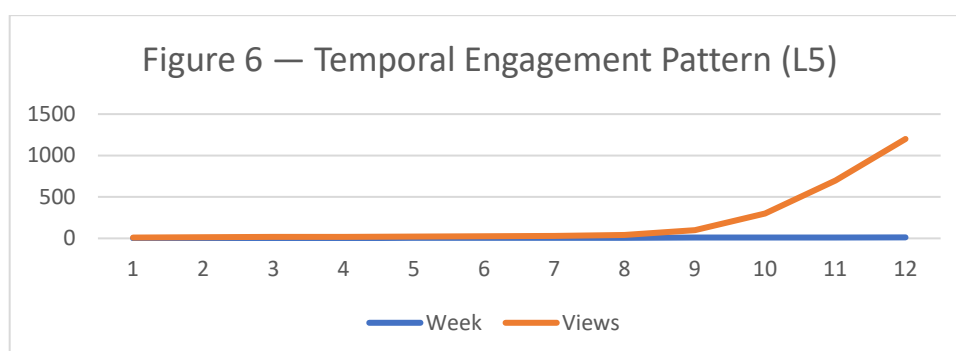


Figure 6 shows that activity remained relatively stable throughout the 12-week semester but, as with Level 4, increased sharply around the 9–12-week period when assessments were taking place. The highest levels of activity are around the 12 weeks when the assessments were due. Level 5 students did not undertake mid-module assessments, so there is likely not the same temporal pattern as for Level 4 at the mid-module period.

The data for Level 5 show characteristics like those of Level 4. Assessment-related resources generated higher levels of interactions than any other recorded category. Recorded interactions with teaching materials were moderate, while interactions with supplementary materials were limited. Moodle activity also showed similar temporal peaks around key assessment periods.

Level 6 (Third Year)

Recorded activity at Level 6 was also like that found at Levels 4 and 5. However, there was a notable difference, and this centred around the use of dissertation-related resources.

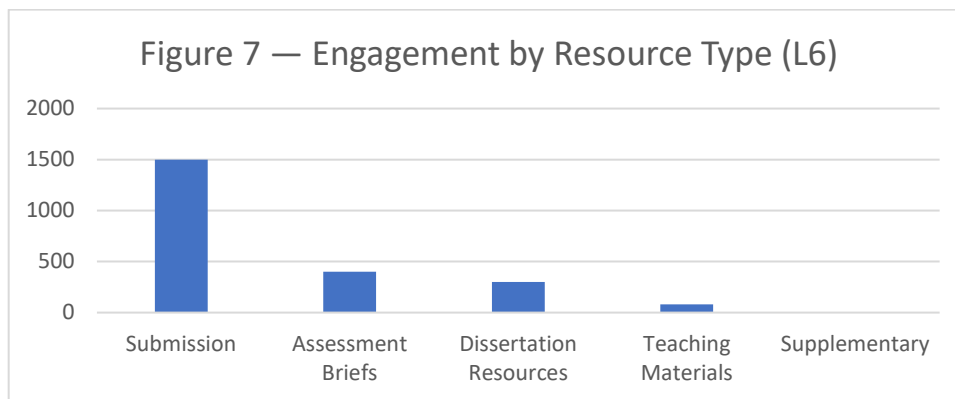


Figure 7 shows that submission portals again generated the highest levels of recorded interactions across taught modules. There was additional activity related to the dissertation and the submission. A further noted increase in activity is observed around dissertation resources. This included ethics, supervision, exemplars, and other research-related resources. Beyond this, as with the other year groups, teaching materials and supplemental resources accounted for very few interactions.

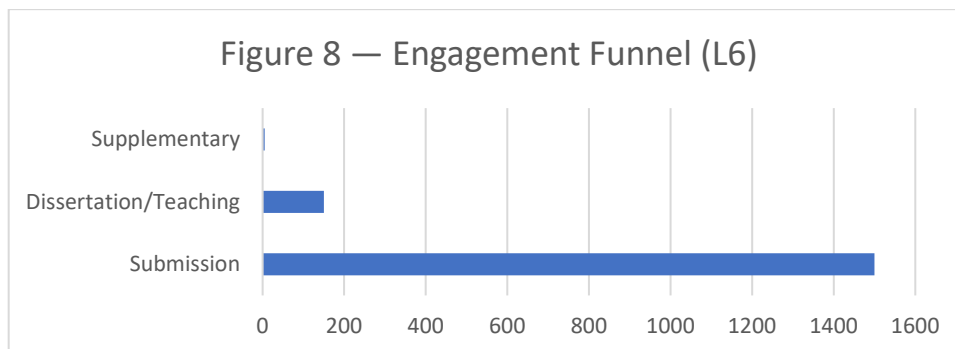


Figure 8 shows a similar narrowing of engagement, with recorded activity across resources focusing mostly on submission, as with the other cohorts. Assessment and assessment-related documents featured prominently in interactions, while teaching materials and other resources were less prominent.

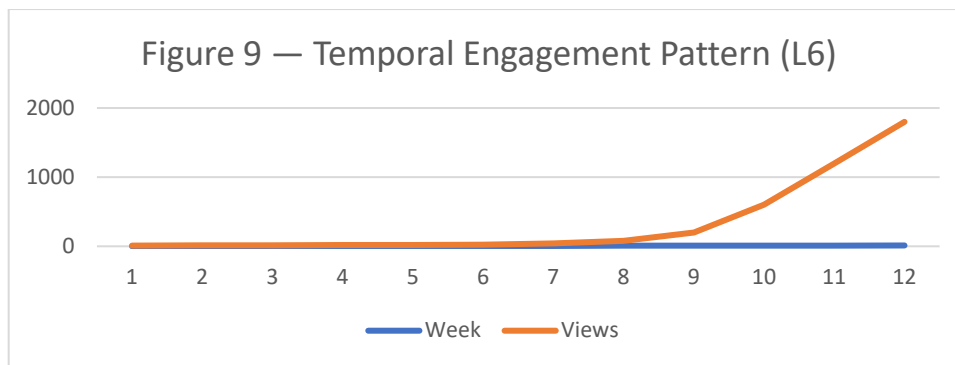


Figure 9 mirrors similar patterns of temporal engagement across the 12 weeks. Recorded activity was stable, with most of it increasing substantially from the 9-week mark through the end of the 12 weeks. Within the dissertation module, the peak of activity is centred around the week 8-9 period when ethics submissions were due. This follows the noted increase from week 10 through week 12, when assessments were due.

The Level 6 data broadly reflect the other interaction patterns observed in Levels 4 and 5. Assessment-related resources, especially those associated with the dissertation, generated the highest levels of recorded interactions. As with the other cohorts, the temporal patterns were very similar, with most activity peaking during assessment time.

Cross-Level Comparison (Level 4 – 6)

The above results show a consistent pattern of Moodle activity across the undergraduate PPD degree programme.

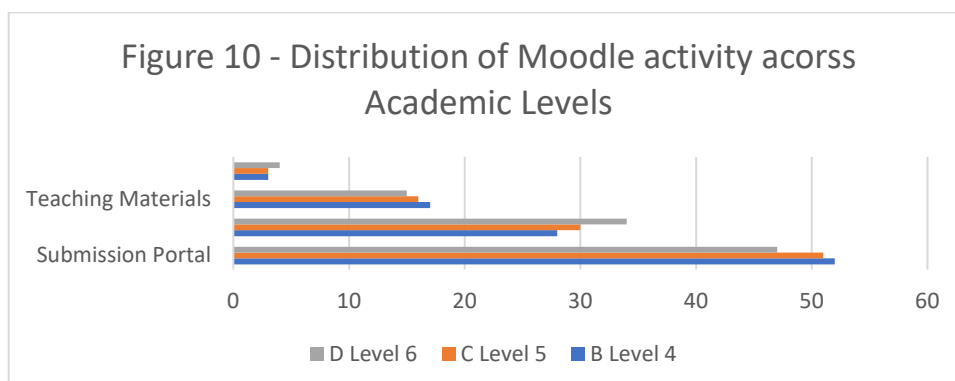


Figure 10 shows the distribution of recorded Moodle activity across the PPD academic levels. The activity is shown as the percentage distribution of recorded

interactions within each year. Figures are based on aggregated platform interactions, not specific users.

Although the number of recorded interactions per year varied, the engagement distribution was relatively similar across year groups. Assessment and submission-related resources were consistently the highest recorded interactions on Moodle. By comparison, the other resources, such as asynchronous and supplemental materials, recorded relatively low interactions.

Temporal patterns were also similar each year, with peaks in recorded interactions taking place right before or at key assessment dates. There were notable differences, however: Level 4 had mid-module assessments, and Level 6 had dissertation milestones.

Together, the findings suggest that this broad pattern of Moodle behaviour remains stable throughout the PPD. The relative prioritisation of assessment-related materials was a constant factor across all year groups, with fewer interactions given to wider learning materials.

Discussion

Across the PPD, the most consistent finding was the over-engagement with assessment resources, while other modular resources, including academic skills, reading lists, and supportive materials, had relatively little engagement. Likewise, the temporal engagement patterns were similar across Levels, with most engagement interactions occurring near assessment time. The findings show that engagement interactions remained relatively consistent across the whole PPD cohort and remained similar as students progressed to the next year.

One possible explanation for this behaviour lies with the TAM proposed by [Davis \(1989\)](#). [Davis \(1989\)](#) proposed that users were likely to engage with technology when they found it to be useful and easily accessible. This is not unique to HE, as students often report engaging with a VLE when there is clear benefit to their academic progression ([Sánchez & Hueros, 2010](#); [Pérez-Pérez et al., 2019](#)). The present findings appear consistent with this view, as the assessment briefs and submission portals are all directly linked to academic progression. However, this centres on what

is a more critical problem: students' interactions on Moodle do not indicate that they see the modular, taught, or supplemental materials as linked to their assessment.

Still, the TAM does not fully explain why students' interactions with Moodle are so assessment-focused in this case. Unlike other technologies considered in the TAM or related studies, Moodle is not optional for students on the PPD. Students must use the VLE to access assessment-related materials and submit their work to complete the degree. This distinction is theoretically important because students may repeatedly access information not because they see Moodle as a learning platform, but because their academic survival depends on it. Indeed, this means that necessity and usefulness become interwoven, thereby extending existing TAM applications within HE.

In turn, the findings also contribute to the wider discussion of digital pedagogy. [Laurillard \(2002\)](#) argued that learning technology is most effective when it facilitates dialogue, interaction, and reflective learning rather than merely distributing information. However, the present findings do not seem to agree with this view. Across all three year groups, the most accessed information was the assessment brief and submission portal, distributed for academic progression purposes. This pitfall is one [McGuire \(2026\)](#) noted: VLEs are mainly repositories for information rather than places of active and supportive learning. Again, the data support this, as the wider academic resources, including support, reading, and academic skills, recorded very limited interaction.

The consistency of the findings further raises some interesting questions about student behaviour on VLEs over time. It could be argued that student engagement on the VLE would evolve as students' progress in their academic careers and gain confidence and greater independence. However, in the present study, this was not the case, as the Moodle activity was nearly identical across Levels 4 through 6. While there was a notable difference at Level 6 between the dissertation and related resources, this is still technically an assessment with assessment-related materials. Therefore, the broad levels of engagement remained relatively similar across the entire PPD.

These findings have further significant implications for Professional Policing education. Against this contextual backdrop, the present study showed that

behavioural patterns observed in PPD students remain topical. If contemporary and even future policing professionals engage with digital learning only through assessment-related resources associated with career outcomes, questions should arise about how universities can encourage broader patterns of independent digital learning that reflect professional learning expectations, especially in the police since digital literacy and technology are essential parts of modern policing ([College of Policing, 2026](#); [NPCC, 2025](#)). The present study suggests that platform activity warrants further review in Professional Policing education, rather than at the software level. The study also shows that learning analytics, when considered alongside pedagogy, educational theory, and programme context, offers an important behavioural lens that universities can use to understand how students interact with complex learning environments.

Limitations

The present study's findings show the value of learning analytics when interpreted appropriately. However, there are limitations, one of which is that institutional analytics alone cannot determine whether meaningful learning has taken place. These analytics only indicate interactions with the VLE, and repeated interactions may show multiple accesses by the same student rather than individual users. Therefore, the findings should be seen as platform behaviour rather than direct measures of learning. Another limiting factor is that this study is only at a single university. The findings show consistency across all year groups, but this does not mean they are generalised to other HE institutions, as differences in assessment types, VLEs, and curriculum design may affect engagement. Lastly, the study uses a descriptive, analytical approach and does not explain why students behave as they do on the VLE. While theories such as TAM have been used as possible explanations, the present study cannot determine why students focus on a specific area of Moodle. Further qualitative research is needed to address this limitation.

Conclusions and Practical Implications

Conclusion

The use of VLEs in HE has clearly transformed the delivery of education. Still, there is work to be done when investigating how students interact with these platforms once they are part of their academic practice. This study sought to address this gap in the context of Professional Policing education by looking at Moodle analytics across all three year groups of a PPD.

The study found a remarkable pattern of interactions among all academic levels. There was a consistent pattern of interactions with the assessment and submission-related materials. These interactions were substantially higher than those for other areas, including teaching materials and academic support. Similarly, the temporal patterns showed striking similarities: activity clusters were higher at assessment times than over a 12-week semester.

Still, while interesting and valuable, these findings alone should not be interpreted as evidence that Moodle is ineffective as a VLE or that students are not learning. However, these patterns remain very important, as the data show that students largely engage with VLEs in predictable ways. This contributes to the ongoing discourse around VLEs and how best to maximise their potential in HE, and it should help support digital learning, since we must understand how students use something before we can improve it.

For Professional Policing education, however, the findings set out here are more important. Modern policing expects officers to have digital literacy. Furthermore, officers are expected to engage in evidence-based practice and critical review. This is something that must continue across their careers from constable to chief officer. Understanding how future police officers interact with institutional digital learning, therefore, becomes a broader question that extends beyond the university.

Practical Implications

The findings of this study suggest that educators might benefit from reconsidering how VLEs are best integrated into programme design. The influx of activity around assessment-related resources shows the primary point of interaction on Moodle. This raises the main question of how asynchronous materials, academic resources, and taught content are integrated into the assessment, or whether students see them as optional content. Therefore, programme teams could revisit module

design and VLEs to better thread content into assessments rather than it being a focal point.

In a professional policing context, there are additional important implications to consider. The [NPCC \(2025\)](#) has stressed the need to increase digital capabilities and literacy, and to ensure ongoing CPD throughout an officer's career. If PPD students are only interacting with VLEs for the sake of assessment, programmes might consider how to better support the development of broader professional learning behaviours in a policing context alongside summative assessment. Such considerations should also be seen as an opportunity for course teams to enhance their curriculum rather than a direct consequence of these findings.

Lastly, this study demonstrates the practical importance of learning analytics. If used correctly, aggregated Moodle data can provide programme teams with objective evidence of how students interact with VLEs. Such data can help constitute a routine component of module evaluation when examining qualitative student feedback and academic performance data.

Further Research

This study presents an opportunity for additional research and investigation. Their use of learning analytics could be combined with qualitative approaches to explore why students focus on assessment-related resources rather than other categories of modular content. In turn, this could provide further insight into what observed student behaviour means for perceived usefulness and approaches to learning and teaching on VLEs. Further to this, the research could be translated into other professional disciplines to see whether similar findings exist in other vocational programmes. Lastly, the College of Policing could consider whether the observed behavioural interactions are linked with academic performance. Such information could be used to provide a richer understanding of how different interaction patterns translate into academic performance and, further afield, into a policing career.

References

Böhmer, A., Schwab, G. and Isso, I. (eds.) (2024) *Digital teaching and learning in higher education: Culture, language, social issues*. Bielefeld: transcript Verlag.
doi:10.14361/9783839462768.

Browne, T., Jenkins, M. & Walker, R. (2006) 'A longitudinal perspective regarding the use of VLEs by higher education institutions in the United Kingdom', *Interactive learning environments*, 14(2), pp. 177–192. doi:10.1080/10494820600852795.

College of Policing (2010) *Continuing professional development*. Available at: <https://www.college.police.uk/career-learning/career-development/CPD> (Accessed: 9 June 2026).

College of Policing (2020) *Policing Education Qualifications Framework Initial entry routes Learning to date: development and implementation, 2016 to 2019*. Available at: <https://assets.college.police.uk/s3fs-public/2021-02/peqf-learning-to-date.pdf>.

College of Policing (2026) *Career and Learning*. Available at: <https://www.college.police.uk/career-learning> (Accessed: 10 June 2026).

Dascalu, M.-D. *et al.* (2021) 'Before and during COVID-19: A Cohesion Network Analysis of students' online participation in Moodle courses', *Computers in Human Behaviour*, 121. doi:10.1016/j.chb.2021.106780.

Davis, F.D. (1989) 'Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology', *MIS Quarterly*, 13(3), pp. 319–340. doi:10.2307/249008.

Deng, L. and Tavares, N.J. (2013) 'From Moodle to Facebook: Exploring students' motivation and experiences in online communities', *Computers and Education*, 68, pp. 167–176. doi:10.1016/j.compedu.2013.04.028.

Guàrdia, L. and Maina, M. (2018) 'FUTURA: Next generation pedagogy—ideas for online and blended higher education', *EADTU Envisioning Report*, 2, pp. 28–30. Available at: http://empower.eadtu.eu/images/report/The_Envisioning_Report_for_Empowering_Universities_2nd_edition_2018.pdf.

House of Commons Home Affairs Committee (2016) *College of Policing Three Years On*. HC [23]. London: House of Commons. Available at: <https://publications.parliament.uk/pa/cm201617/cmselect/cmhaff/23/23.pdf>

Kirkwood, A. and Price, L. (2014) 'Technology-enhanced learning and teaching in higher education: what is "enhanced" and how do we know? A critical literature review', *Learning, media and technology*, 39(1), pp. 6–36. doi:10.1080/17439884.2013.770404.

Laurillard, D. (2002) *Rethinking university teaching : A conversational framework for the effective use of learning technologies*. 2nd ed. London : Routledge Falmer.
doi:10.4324/9781315012940.

Lonn, S. & Teasley, S.D. (2009) 'Saving time or innovating practice: Investigating perceptions and uses of Learning Management Systems', *Computers and Education*, 53(3), pp. 686–694. doi:10.1016/j.compedu.2009.04.008.

Martin, D. (2022) 'Understanding the reconstruction of police professionalism in the UK', *Policing & Society*, 32(7), pp. 931–946. doi:10.1080/10439463.2021.1999447.

McGuire, M. (2026) 'Reclaiming pedagogy in virtual learning environments: educator and student perspectives', *Teaching in higher education*, pp. 1–21.
doi:10.1080/13562517.2026.2614964.

Montenegro Rueda, M. *et al.* (2024) 'Perspectives on online learning: Advantages and challenges in higher education', *Contemporary educational technology*, 16(4), p. ep525. doi:10.30935/cedtech/15011.

Naimi-Akbar, I., Weurlander, M. & Barman, L. (2024) 'Teaching-learning in virtual learning environments: a matter of forced compromises away from student-centredness?', *Teaching in higher education*, 29(8), pp. 2095–2111. doi:10.1080/13562517.2023.2201674.

National Police Chiefs' Council (2025) *National Policing Digital Strategy 2025–2030*. Available at: <https://news.npcc.police.uk/resources/national-policing-digital-strategy-2025-2030> (Accessed: 11 June 2026).

Pan, Z., *et al.* (2024) *A Systematic Review of Learning Analytics*. *Journal of Learning Analytics*, Volume 11(2), 52–72. <https://doi.org/10.18608/jla.2023.8093>.

Pérez-Pérez, M., Serrano-Bedia, A.M. and García-Piqueres, G. (2020) 'An analysis of factors affecting students' perceptions of learning outcomes with Moodle', *Journal of Further and Higher Education*, 44(8), pp. 1114–1129. doi:10.1080/0309877X.2019.1664730.

Rapanta, C., L. Botturi, P. Goodyear, L. Guàrdia, & M. Koole (2020) Online university teaching during and after the COVID-19 crisis: refocusing teacher presence and learning activity. *Postdigital Science and Education* 2: 923–45. doi:10.1007/s42438-020-00155-y.

Ramshaw, P. & Soppitt, S. (2018) 'Educating the recruited and recruiting the educated: Can the new Police Education Qualifications Framework in England and Wales succeed where others have faltered', *International Journal of police science & Management*, 20(4), pp. 243–250. doi:10.1177/1461355718814850.

Rogers, C., Pepper, I. & Skilling, L. (2022) 'Evidence-based policing for crime prevention in England and Wales: perception and use by new police recruits', *Crime Prevention and Community Safety*, 24(4), pp. 328–341—doi:10.1057/s41300-022-00158-w.

Salmon, G. (2013) *E-tivities : the key to active online learning*. 2nd ed. New York: Routledge.

Sánchez, R.A. and Hueros, A.D. (2010) 'Motivational factors that influence the acceptance of Moodle using TAM', *Computers in human behavior*, 26(6), pp. 1632–1640. doi:10.1016/j.chb.2010.06.011.

Selwyn, N. (2022) *Education and technology : key issues and debates*. 3rd ed. London, England ; Bloomsbury Academic.

Siemens, G. & Baker, R.S.J. d (2012) 'Learning analytics and educational data mining: towards communication and collaboration', in Ferguson, R., Gasevic, D., and Buckingham Shum, S. (eds) *LAK 2012 : proceedings of the 2nd International Conference on Learning Analytics and Knowledge : April 29-May 2, 2012, Vancouver, British Columbia, Canada*. New York, NY, USA: ACM, pp. 252–254. doi:10.1145/2330601.2330661.

Strong, J. (2019) *Policing Education Qualifications Framework (PEQF) implementation Frequently Asked Questions*. [Police Federation]. Available at: <https://polfed.org/Wilts/media/1580/policing-education-qualifications-framework-faqs.pdf>.

Weaver, K. *et al.* (2021) 'How far does VLE self-directed study facilitate improvements in written, practical and overall assessment results? Sports therapy case study', *Innovations in Education and Teaching International*, 58(2), pp. 219–229. doi: 10.1080/14703297.2020.1722201.

Weller, M. (2020) *25 years of ed tech*. Edmonton, AB: AU Press, Athabasca University.