

Mentor and Apprentice Perspectives on Assessment Practices in Graduate Apprenticeships

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Abstract

In this case study, the findings from an assessment and feedback evaluation study within the School of Engineering and Physical Sciences at Heriot-Watt University are explored from the perspectives of both apprentices and work-based mentors within Scottish Apprenticeships. These graduate apprenticeship (GA) programmes include Engineering Design and Manufacture, Engineering Instrumentation, Measurement and Control, and Data Science. The evaluation study aimed to identify challenges and opportunities in aligning work-based project learning and assessment with module learning outcomes for these programmes; it was a mixed-methods study, combining 1) qualitative and quantitative data collection through a focus group with apprentices and 2) online surveys with work-based mentors and apprentices. Key study findings highlight the importance of clear assessment instructions, robust assessment rubrics, workplace relevance and timely, objective feedback from academics and work-based mentors. The evaluation study also confirms the importance and central role of work-based mentor involvement in assessment practices, and the importance of working in a strong partnership; it also proposes a series of assessment enhancements and practical-orientated support reflections for individuals involved in apprenticeship programmes. Given the growth in degree level apprenticeships across the United Kingdom, this case study and its practical assessment insights are likely to be of particular interest to apprenticeship providers, curriculum developers and employers invested in this area.

Keywords: Work-integrated learning, industry-academic collaboration, workplace relevance, real-world learning

Overview

The integration of industry within higher education (HE) curricula has become a strategic imperative for universities seeking to enhance graduate employability and relevance. Scotland offers apprenticeships at school, college and university level, respectively referred to as 'foundation', 'modern' and 'graduate' apprenticeships. All offer a structured pathway for learners to gain qualifications while engaging directly with the workplace through their employment (Scottish Government, 2021). Apprenticeships are funded by the devolved government in Scotland and are delivered by many Scottish universities through collaborative partnerships with employers (Skills Development Scotland, n.d.). These programmes reflect a national commitment to bridging the gap between education and industry, with graduate apprenticeships (GAs) representing the most advanced tier by enabling learners to earn university degrees (up to honours level) while working in paid roles; accordingly, this paper focuses specifically on this university-level provision. In GAs, the tripartite collaboration between the apprentice, the employer (work-based mentor), and the learning provider (university) are key to its success (figure 1).

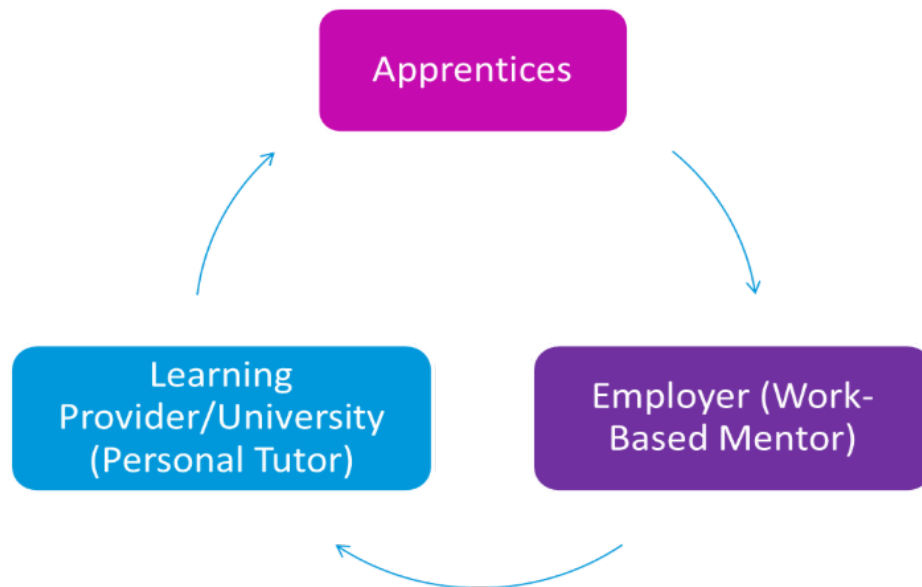


Figure 1. The tripartite graduate apprenticeship partnership

Scotland's education system is distinct in offering four-year undergraduate degrees, which provide more scope for embedding work-based learning than the three-year undergraduate degree model commonly found in other nations of the United Kingdom (UK). GAs leverage this structure to deliver a hybrid model that combines academic study with substantial work-based learning (WBL). These programmes are designed not only to develop technical competencies but also to foster professional identity through authentic engagement with workplace challenges (Jackson, 2017).

At Heriot-Watt University, GA programmes are structured around work-based projects that serve as both learning experiences and assessment opportunities. Examples of these work-based assessments include technical reports, project presentations and reflections on workplace learning and development. However, the effectiveness of this model depends heavily on: 1) the alignment between academic expectations and workplace challenges and 2) the collaboration between apprentices, academic staff and work-based mentors.

This case study illustrates how industry-integrated curriculum design may be strengthened through assessment practices; it draws upon the experiences and practices of the authors and the challenges often associated with bridging academic knowledge and the assessment of this in a workplace setting. By examining the lived experiences of apprentices and mentors, the authors share practical ideas and approaches to a more evidence-informed curriculum and assessment design. Given the limited opportunities for shared learning across the wider apprenticeship field, the insights in this case study are anticipated to be of practical value to others working in the work-integrated learning area.

Literature review

The GA model in Scotland is an example of work-integrated learning (WIL), an educational integration of academic theory and professional practice, to support the transition of students from educational institutions to workplace settings (Ferns *et al.*, 2014; Smith *et al.*, 2023). This model is increasingly recognised as a strategic priority for universities globally, driven by demand for graduates equipped with the essential skills and real-world experiences needed for thriving in a dynamic labour market (Cooper *et al.*, 2010). The success of WIL hinges on the active collaboration of three key stakeholders: the student, the educational institution and the industrial employer (Ismail *et al.*, 2015; Perkins and Irwin, 2023). The benefits are extensive and mutually beneficial (Kay *et al.*, 2019). For students, WIL enhances career clarity, personal development and confidence by allowing them to apply technical knowledge in authentic settings. For employers, it serves as a valuable recruitment tool, provides access to fresh ideas and helps fulfil corporate social responsibility. Universities, in turn, benefit from strengthened industry connections and opportunities for collaborative research (Awasthy *et al.*, 2020).

GAs in the UK embody both WIL and its subset, work-based learning, which is defined as learning that occurs within a work environment through active participation in professional practices (Atkinson, 2016). In GA programmes, which are unique among degree-level qualifications, apprentices work alongside their studies and the workplace component forms a substantial part of their learning (Shoukry and Tierney, 2022). This hybrid model merges the roles of employee and GA, providing a clear pathway for apprentices to develop professional skills, apply academic theory and earn a degree without accumulating student debt (Smith *et al.*, 2021). This ‘learn while you earn’ approach both helps employers bridge the skills gap by its provision of highly skilled, customised talent and ensures that university curricula remain relevant and balanced (Dziallas *et al.*, 2021).

A central, yet complex, element of the GA model is the work-based learning (WBL) assessment, which typically comprises at least eighty per cent of a programme's total assessment (Faulkner-Jones *et al.*, 2022). These assessments are designed to foster deep learning by encouraging apprentices to move beyond surface-level knowledge and apply theoretical concepts to real-world problems. They are considered authentic because they are based on genuine workplace projects, directly linking academic learning with practical application (Villarroel *et al.*, 2018).

Navigating assessments can pose significant challenges for apprentices. The demanding schedule of a full-time job combined with academic coursework often leads to time management issues. A major hurdle facing apprentices is the challenge of connecting their extensive practical experience to theoretical concepts; furthermore, a lack of clear guidance on how to develop ‘transversal skills’ (crucial for success) like leadership and problem-solving compounds the difficulty. This is where the guidance of a dedicated work-based mentor and/or personal tutor is vital (Lavery *et al.*, 2023).

This case study explores the practical issues associated with GA assessment at Heriot-Watt University, where settings and stakeholder requirements can vary considerably. While existing WIL studies tend to focus on placements and internships, less emphasis has been given to GAs (Dempsey *et al.*, 2024; Jackson *et al.*, 2025). Since Ferns and Zegwaard (2014), working in this field, have previously identified that these individualised learning experiences in the workplace may be challenging to assess, there must be more work in this area to develop more balanced assessment practices.

Our approach

We conducted a mixed-methods study to help us understand the views of both apprentices and work-based mentors. On this basis, we would be better able to make work-based assessments relevant and responsive to the workplace problems experienced by the apprentices. Our approach was sequential, with two online assessment and feedback evaluation surveys followed by a focus group to gather apprentices' and mentors' views and insights. The surveys were open for a period of four weeks and invited responses from current and alumni apprentices and their mentors. Both surveys were launched in January 2025 and explored the following themes through a combination of open and closed question types:

1. assessment guidance and methods;
2. quality and use of feedback;
3. assessment and feedback management;
4. availability of learning resources;
5. the relationship between assessment and learning.

A contact internal list of seventy-eight work-based mentors and 171 apprentices gathered views for sampling. Invitations were distributed via email and included full ethical information about the study. To support this research project, a paid student intern (appointed from Heriot-Watt University) co-devised the survey in collaboration with the academic research project team. Typically, student cohort sizes for the programmes per academic year are: Engineering Design and Manufacture (40); Data Science (15); Engineering Instrumentation, Measurement and Control (10). The distribution of survey responses by degree programme was: Engineering Design and Manufacture (68%); Data Science (28%); Engineering Instrumentation, Measurement and Control (4%).

To gain deeper insights, we held an online focus group with four current apprentices and alumni (from within the past two years). An academic moderator from the research team led this one-hour session that allowed participants to discuss their views in greater depth. We shared ethical information in advance and the discussion topics complemented both the Microsoft Forms-delivered surveys. We had intended a focus group for work-based mentors as part of the data collection, but scheduling challenges prevented it.

We used Microsoft Excel for the initial download and preliminary cleaning of the raw data (including tasks such as removing inconsistencies and organising the dataset for further processing) and Python for cleaning subsequent data cleaning to ensure consistency prior to analysis. All data visualisations were generated programmatically using Python – specifically the Seaborn and Matplotlib libraries. We deployed no AI tools at any stage of the visualisation or analysis process. For the thematic analysis, the lead author systematically coded the data by identifying relevant patterns and concepts and then grouped these codes into broader themes that captured meaningful patterns in relation to the research questions, following the approach outlined by Braun and Clarke (2006).

All surveys were anonymous and focus group data were anonymised and all data were stored on a secure server and treated confidentially in accordance with the ethical approval received from Heriot-Watt University, School of Engineering and Physical Sciences Ethics Committee (research project 9466). Prior to the launch of the survey, two colleagues tested a pilot version to identify and refine any ambiguous and/or biased questions. We sent two reminder emails to encourage completion and to enhance survey response rates and focus group participation.

Key Findings

Survey responses were received from twenty-five apprentices and seven mentors across the Engineering Design and Manufacture, Data Science, and Engineering Instrumentation, Measurement and Control programmes. The distribution of apprentice and mentor respondents by year of study or recent alumni is shown in figure 2.

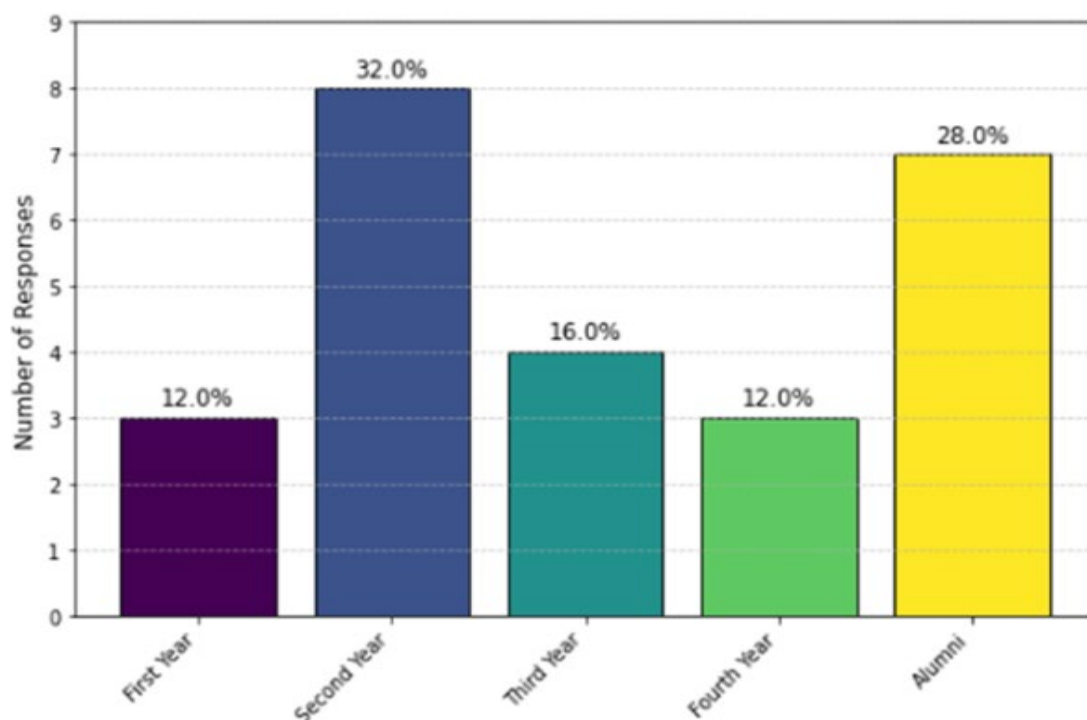


Figure 2. Analysis of apprentice survey responses by year of study

Survey responses were received from across the full range of year groups and recent alumni; the alumni were individuals who had graduated from the programme within the previous two years. The highest participation in the survey was from second-year apprentices (32%, n=8) and alumni (28%, n=6), followed by third year (16%, n=4), first year (12%, n=3), and fourth year (12%, n=3). Gender distribution among apprentice respondents was: men (76%, n=19), women (20%, n=5) and 'preferred not to disclose gender' (4%, n=1). The gender distribution was broadly representative of the cohort demographics.

Further selected findings from the apprentice survey are included to illustrate trends and insights and these are presented below.

Figures 3a to 3c provide survey results for mentor support in WBL regarding work-based mentor involvement in assessment practice.

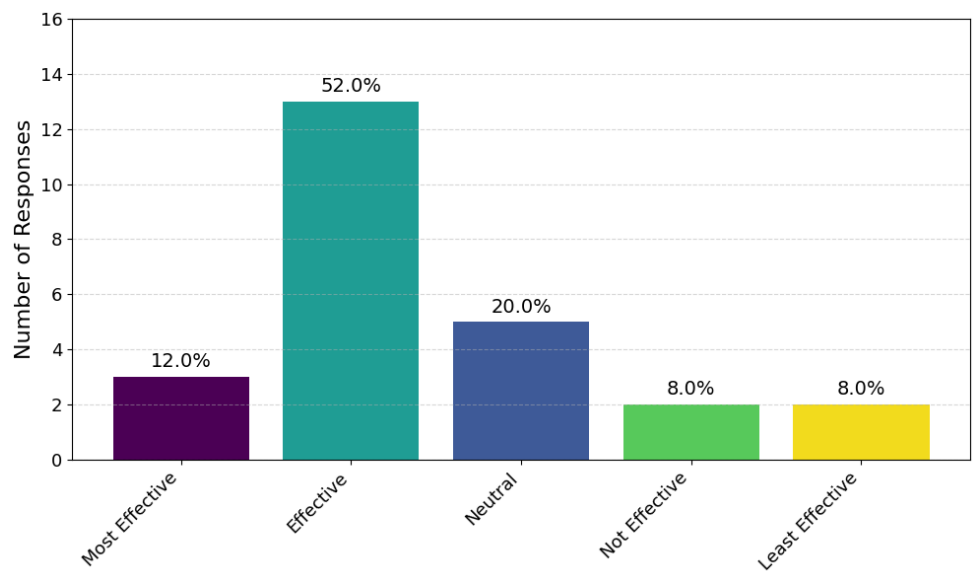


Figure 3a Clarity of instructions

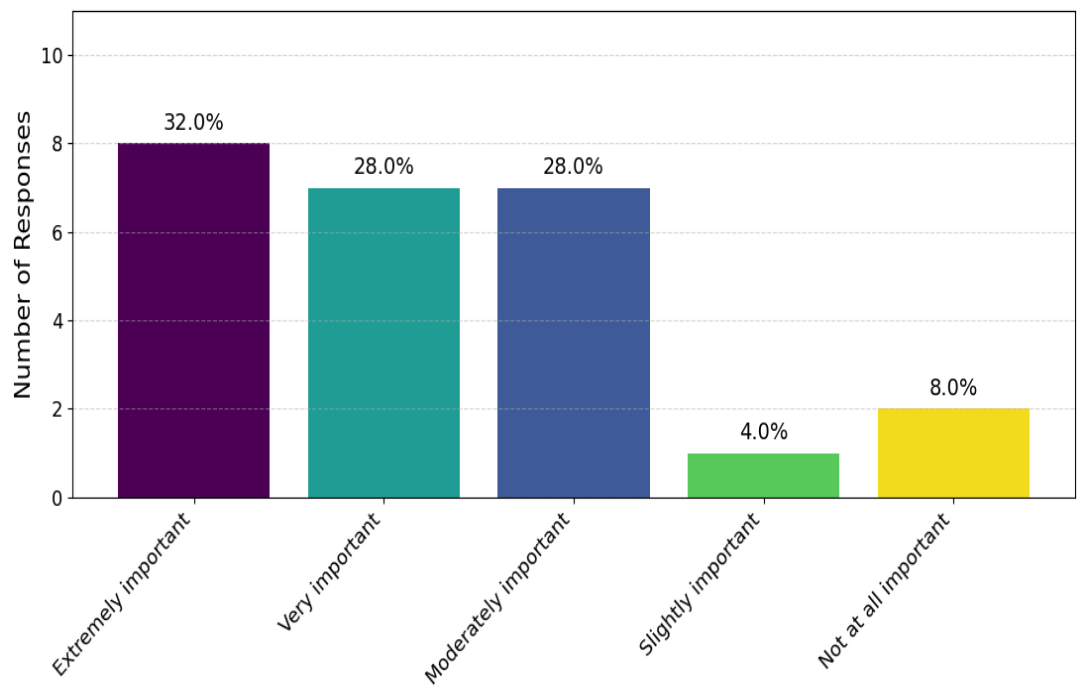


Figure 3b Receiving timely feedback and support

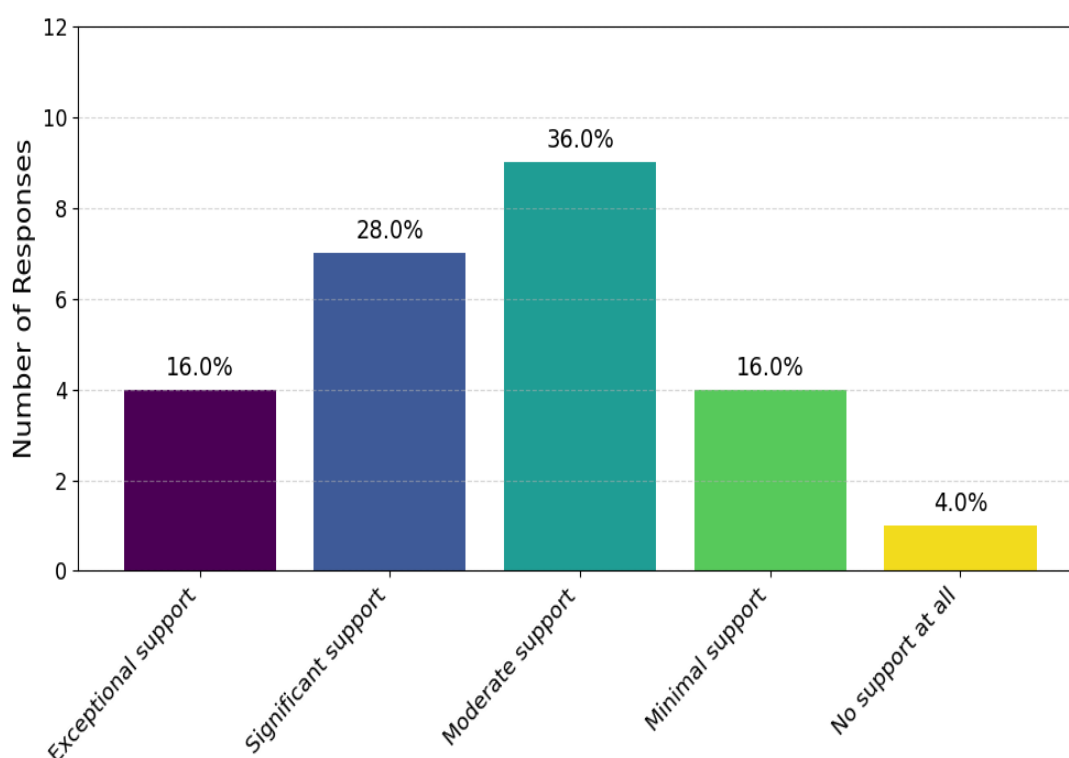


Figure 3c Ratings for mentor support in WBL problem identification

Three work-based mentor areas were covered in the apprentice survey, using five-point Likert scale questions. For the clarity of instructions: 52% found assessment instructions effective, 20% neutral, 12% most effective, 8% least effective and 8% not effective (figure 3a). For timely feedback and support from work-based mentors, there was strong support for the value of this role indicated by the distribution of apprentice responses: 32% extremely important, 28% very important, 28% slightly important, 4% not at all important and 8% no response (figure 3b). This positivity from the apprentices was echoed in the responses to the rating of mentor support for apprentices in the work-based learning assessment problem identification: 36% received moderate support, 28% significant support, 16% exceptional support, 16% minimal support and 4% no support at all (figure 3c).

In the survey findings, mentor involvement emerged as a critical factor in successful work-based learning curriculum integration (figure 3c). We distinguish between *mentor involvement*, which reflects minimal engagement (e.g., attending meetings and completing administrative tasks), and *mentor support*, which involves a more proactive role, such as helping apprentices identify relevant projects and protecting study time. Apprentices who reported higher levels of mentor support reported greater confidence in applying theoretical knowledge to workplace tasks and navigating assessment requirements. A progressive learning journey was also evident, with apprentices receiving more structured support in Year 1, something which naturally diminishes as they develop confidence and competence throughout the programme. Limited involvement was sometimes linked to mentors' lacking sufficient technical background to provide deeper support. The apprentice focus group provided an ideal opportunity to explore, with the apprentices, the mentor role and the survey data in greater depth; this is covered in the next section.

Evaluation

The apprentice survey, distributed in January 2025, was completed by twenty-five current apprentices and recent alumni; the work-based mentor survey was completed by seven current mentors. In the Scottish Graduate Apprenticeship programmes, mentors undertake a central role in supporting their allocated apprentice(s) throughout their degree. The role includes facilitating learning in the workplace, providing constructive and developmental feedback and offering relevant training (Stephens *et al.*, 2014). A selection of comments and views is provided below from the research data, to illustrate the themes emerging from the surveys and focus group. These have also been used to inform a range of graduate apprenticeship assessment enhancement activities (table 1).

1. Assessment clarity and outcome-aligned feedback

In the study, apprentices highlighted the need for clearer guidance throughout the assessment process and said that exemplars would be welcomed, as illustrated by the following remark:

“Clear examples and instructions for WBL assessments are very useful along with scoring rubrics.” (Data Science, apprentice)

Apprentices revealed that they value feedback that is both detailed and directly relevant to their work, particularly for work-based learning assessments. Objectivity and clarity were also noted, alongside an appreciation for feedback focusing on criteria and outcomes and time to engage in dialogic feedback, as exemplified by this comment (Maheshi *et al.*, 2024):

“Both positive and constructive feedback is required for learning and development. Although I realise this would increase the time demands on teachers but having a face-to-face conversation to discuss the assignment and final markings would be very useful.” (Data Science, apprentice)

2. Alignment between academic content and workplace practice

Apprentices indicated that at times, the academic requirements were not fully aligned with the nature and scope of the work-based learning projects available in their professional settings. This suggests the need for a more structured analysis of curriculum design and assessment methods.

3. Emphasis on real-world relevance

In the study findings, there was preference for assessments and learning activities that mirror large-scale industrial and corporate contexts, rather than focusing on niche or isolated problems. Apprentices reported that access to previous examples supported their understanding of assessment expectations and standards, helping them to contextualise what was required without perceiving a need to produce excessively elaborate work.

“Examples of what a good assignment would look like would have helped. This was very beneficial for the final dissertation.” (Data Science, apprentice).

4. Views on work-based learning and traditional assignments

The WBL format was considered more meaningful than traditional exams or assignments, as this assessment format offers practical experience and workplace relevance, as indicated in this remark:

“I would say it is a very refreshing way of learning the WBL activities. I am actually learning a topic whereas in the past I learned to pass exams and immediately forgot the information on passing.” (Engineering Design & Manufacture, apprentice).

In contrast, some students in the focus group indicated a preference for traditional assessment formats, particularly essays, for their familiarity and structure.

5. Timely feedback

Some apprentices emphasised that feedback is most effective when provided close to the time of submission, when their assessment was still fresh in mind. Such timely feedback was considered as more supportive and meaningful for developing their learning, as indicated in this comment:

“Ensuring the feedback received was used for future submitted work. This meant no lost marks going forward.” (Engineering Design and Manufacture, apprentice)

6. Appreciation of mentor feedback

Apprentices especially valued receiving more direct feedback from their work-based mentors, as well as from academic staff. Constructive comments and guidance provided by mentors on assessment tasks helped apprentices connect theory to practice, refine their approach, and feel more supported in their professional development. Regular mentor feedback was seen as essential for their learning, and it is evident from comments that this feedback approach is valued:

“My report writing in both university and work have vastly improved due to the feedback of professors and my workplace mentor.” (Engineering Design and Manufacture, apprentice)

7. Work-integrated assessment partnerships

Study findings reinforced the importance of providing apprentices and work-based mentors with clear programme and module handbooks and appropriate support. Having this information helps to frame the identification of suitable work-based projects and ensures the workplace context supports academic goals while strengthening the university-employer partnership. Providing clear guidance and support is intimated in this mentor’s comment about personal professional development:

“I attended the Graduate Apprenticeship Mentor Skills Awareness Webinar hosted by Heriot-Watt University.” (Work-based mentor)

Table 1 presents seven emerging themes from the student-facing assessment and feedback evaluation survey and associated focus group. Associated with each theme, one or more prompt questions were designed to stimulate graduate apprenticeship teaching teams to

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reflect on their own assessment and feedback practices, as well as illustrate potential enhancement actions for each assessment theme. The authors, informed by their own experiences of GA programme delivery, together devised these reflective prompt questions to provide readers with the opportunity to review their own teaching context. This section of the case study is likely to be of practical interest for others not involved in teaching apprentices, but who are involved with work-integrated assessment and feedback practices in their own teaching context.

Assessment Enhancement and Practical Implications

Table 1: Emerging assessment themes from the surveys.

Theme	Reflective Prompts	Proposed Enhancement Actions
Assessment clarity and outcome-aligned feedback	In what ways are apprentices in your module able to discuss the assessment task, criteria and expectations with academics? As a teaching team, how do you develop consistent feedback practices that align with module learning outcomes and the assessment criteria, in order to help ensure objectivity for all apprentices?	• Ensure explicit student-facing assessment project briefs and marking rubrics across teaching teams. (Nicol, 2007) • Offer student support sessions on assessment requirements. • Use assessment rubrics aligned to each learning outcome. • Provide refresher feedback sessions for assessors to help establish consistent feedback practices.
Alignment: academic and workplace	How are assessments across the programme continuously reviewed to take account of changing business needs and developments?	• Assess the feasibility of an early academic year tripartite meeting to collect stakeholder feedback. • Offer sector-relevant case studies as alternative approach to projects.
Real-world relevance	In what ways are assessments in your modules authentic and relevant to the workplace?	• Collaborate and provide work-based mentors with exemplars from industry contexts to foster peer sharing. • Facilitate opportunities to co-design assessments.
Work-based learning versus traditional assignments	How do assessment practices across the programme recognise and respond to different apprentice backgrounds and needs?	• Explore choice between work-based projects and traditional assignments. (Plooy <i>et al.</i>, 2024)

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Timely feedback	How effective is the programme teaching team in providing feedback within the institutional timeframe, to support apprentice learning and progress?	• Ensure all assessors are briefed early about expectations, timelines and assessment processes. • Set automated assessment schedule reminders for assessors.
Mentor feedback	In what ways can universities and employers formalise and integrate work-based mentor feedback into assessments?	• Encourage apprentices to request mentors to review assessments, before submitting the draft.
Work-integrated assessment partnerships	How can teaching teams work in partnership with employers to create a structured assessment programme?	• Provide employer onboarding assessment pedagogy and practice sessions.

Final thoughts

This case study provides a snapshot of the lived assessment experiences of apprentices across three graduate apprenticeship programmes. Gathering perspectives on assessment and feedback from both apprentices and work-based mentors offers a valuable opportunity to enhance academic understanding and delivery of work-integrated assessment practices; this area to date has received limited scholarly attention in the graduate apprenticeship field. Applied learning and assessment are important to ensure relatability and relevance and continuing to develop this area through exploring and co-developing this with industry partners is of paramount importance.

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