

INTERVIEWS AS AN AUTHENTIC FORM OF ASSESSMENT AND LEARNING IN THE ERA OF ARTIFICIAL INTELLIGENCE

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Abstract. Before the arrival of modern universities, education in the professional disciplines such as civil engineering was rooted in practical experiences undertaken under the guidance of a master builder or engineers in the guilds. The institutional approach only became formalised in the 18th century with universities largely taking over civil engineering education by the late nineteenth century. At this time universities adopted assessment techniques such as oral examinations, fieldwork assessments, drafting assessments and defending project work before a panel of professors or professional engineers. In the modern university, written exams and projects have become the dominant tools for evaluating learning. The integrity of these affordances, particularly when executed outside a proctored environment, is now challenged by the use of AI technology. This paper summarises how incorporating oral defence (aka interviews) as an assessment tool helps differentiate individual student performance and protects the integrity of the learning environment. The interview also prepares student engineers for life in the profession.

Since its launch in 2008, the civil engineering programme at the University of Limerick (Ireland) employs interviews as an assessment tool throughout its undergraduate programme. The authors have found interviews to be a robust and reliable means of i) evaluating student learning and ii) discerning if students have undertaken the necessary research to gain understanding.

This paper outlines how interviews are used to assess individual student's understanding of project work when undertaken as part of a team-based exercise. The paper also describes how the efficiency of the interview process can be retained for large class sizes by making small adjustments to adapt the interview methodology for group interviews. Finally, by scheduling the interviews in advance of the final examination allows students to fill gaps in their knowledge prior to the examination. The latter is a popular decision confirmed by graduate feedback collected over the first decade of programme graduates.

1 INTRODUCTION

1.1 The role of assessment

Assessment methods in higher education engineering programs play a critical role in measuring student learning and can also influence teaching strategies [1,2]. While traditional written examinations and coursework remain prevalent, there is increasing emphasis on

alternative assessment methods that better align with the development of complex problem-solving and communication skills essential in engineering practice [3,4,5]. Interviews are a valuable but often underutilized tool in this context, offering opportunities to assess reasoning, and reflective thinking in addition to content knowledge [6].

1.2 Pedagogical foundations

The pedagogical rationale for interviews is grounded in sociocultural and constructivist theories of learning [7,8], which emphasize the importance of dialogic interaction in the co-construction of knowledge [9]. In engineering education, where knowledge application and integration are essential, interviews can reveal a student's depth of understanding and ability to articulate problem-solving processes [10]. Interviews can also serve as a formative assessment tool, enabling instructors to provide timely and targeted feedback [11,12].

1.3 Implementation in engineering education

When used in engineering programs, interviews are applied to assess capstone design projects, ethics modules, and reflective components of work placements or cooperative education schemes [13] and can vary in form e.g. structured oral exams, viva voces, or informal reflective discussions. Interviews can effectively assess competencies that written tests often miss, such as communication skills, ethical reasoning, and professional identity formation [14,15].

Interviews present scalability challenges for large cohorts. To address this, some programs have adopted group interviews where small groups of students are interviewed together on shared projects or case scenarios. This approach reduces logistical burdens and allows interpersonal dynamics and collaborative reasoning—key components of engineering practice to be observed [16].

Interviews also play a growing role in safeguarding academic integrity in the age of generative AI. As tools like ChatGPT become increasingly capable of producing sophisticated engineering work, educators face new challenges in verifying student authorship and understanding. Interviews—whether individual or group-based—offer a direct method of assessing whether students can explain and justify their submissions, thus ensuring that learning outcomes are genuinely achieved [17].

1.4 Limitations and challenges

Despite their advantages, interviews present several challenges. In large engineering cohorts scalability can be problematic. Reliability and consistency are also issues, as interviews can introduce subjectivity, especially if multiple assessors are involved. Structured or semi-structured formats, combined with standardized rubrics, help enhance objectivity and comparability [12]. Assessor training is essential to ensure alignment with intended learning outcomes and fairness across diverse student groups.

Student anxiety is another challenge, particularly for those unfamiliar with oral assessments. However, if interviews are framed as formative and supportive rather than high stakes, they can enhance students' confidence and engagement [11]. Equity considerations are also important—interview formats should be inclusive and sensitive to linguistic and cultural diversity to ensure fair assessment for all students.

2 METHODOLOGY

2.1 Programme description

In 2008 the University of Limerick (UL) launched Ireland's first university level Civil Engineering programme in over one-hundred and fifty years. This presented a unique opportunity for the designers of the programme to transform how civil(ian) engineers are educated to better serve modern society. An academic team of six engineers, possessing significant industry experience, combined their expertise on 'how' to engineer by drawing on personal reflections and on their now outdated 'traditional' didactic undergraduate education.

The outcome of these deliberations led to the creation of a modern educational programme that stimulates and motivates students to engage in the interesting challenges faced by civil engineers today. A core value of the resulting programme is the pedagogy chosen for delivery. The programme adopts a Problem Based Learning (PBL) ethos in which students work in small teams to develop solutions to open-ended real-world problems.

The under-graduate programme is delivered through a mix problem-based learning (PBL) projects carried out by student teams in a studio environment. The projects are supported by 'just-in-time' active teaching and laboratories that are linked to the problem. Each problem or trigger drives the learning outlined within the relevant module syllabi.

2.2 Use of interviews

A variety of assessment instruments are used across the programme; however, this paper focuses on the 'interview' as a rigorous assessment instrument. Interviews have been an integral part of the UL programme since its inception, with group interviews becoming more prevalent as student numbers have increased. While Year 1 is a common first year undertaken with several other engineering disciplines, individual and group interviews are carefully distributed across the other 4 years of the programme as summarised in Table 1.

Table 1: Interview assessments on UL Civil Engineering programme

Year	No. of Interviews	
	Individual	Group
2	0	3
3	0	3
4	2	1
5	3	1

Students participate in at least 10 interview assessments during their time on the programme (some Year 5 interviews are in elective modules). At the completion of a trigger, either an individual or team interview is conducted to evaluate mastery of the project's learning outcomes. The interview is conducted by the module leader or by module leaders/practitioner if the project spans across several modules.

As the programme architecture is linked to actual engineering practice, the academic team set out to reinforce the benefits of working collaboratively in teams to arrive at creative solutions to the problems posed. For this reason, the breakdown of assessment across the programme is typically 50% continuous assessment and 50% written examinations. Within the

continuous assessment activities, the authors recognise that contributions from each member of the team may not be equitable, and if left unchecked, can lead to disharmony within the group. To address this, modules typically allocate a weighting in the range of 15-25% to the interview.

In recent years we have found the interview plays a more important role in the evaluation of students' learning. The growth of AI use by students has meant that the integrity of the more traditional forms of assessments undertaken outside of class time are more open to abuse of AI. The interview on the other hand provides a more robust assessment tool for evaluation of learning. The following section outlines the interview methodologies employed by the UL civil engineering programme.

3 INTERVIEW METHODOLOGIES

When student numbers are manageable (circa 25) individual interviews are undertaken with each student on a team. However, when numbers are large, team or group interviews are conducted. In the case of individual interviews, the academic member alone undertakes the one-to-one interviews. In the case of group interviews, an academic member from the team and an experienced engineer from practice conduct the interviews. Usually, the practitioner and the academic have been working together as part of the PBL trigger being assessed and have a clear understanding of the aims and objectives of the project. Both participate in the first two group interviews and independently grade the performance of each student within the group; these initial interviews are allocated an additional five minutes to facilitate discussion of the results and to agree a grade based on the evidence recorded by each interviewer. This calibration exercise aims to ensure equity of grading across the cohort. The remaining group interviews are then allocated randomly between the engineering consultant and the academic member of staff.

The general procedure for conducting team interviews is as follows:

- Develop a timetable for interviews.
- Host the interviews in a room with whiteboards and moveable seating.
- Have the team form an arc around the whiteboard (Figure 1), each member standing from left to right in the order listed in the interview schedule. This along with audio recording the interview assists in identifying each student's responses when allocating their grade following the interview. As a complement to this, Table 2 is completed at the end of each interview.



Figure 1: Team interview in progress with the module leader and consultant practitioner present.

Table 2: Template for recording interview performance

Likert Scale*					Student	Comments
1	2	3	4	5		
		✓			Student 1	Good on fundamentals, more work req'd on topic x
			✓		Student 2	More focus on analytical topics required
	✓				Student 3	Poor grasp of Project LO's and topic fundamentals.
				✓	Student 4	Outstanding performance
		✓			Student 5	Average performance, Good on basics of the topic

* 1=Unsatisfactory, 5=Excellent.

- Each team member is given a different colour whiteboard marker and is encouraged to use the whiteboard where appropriate when responding to technical questions. As all students contribute to the whiteboard during the interview, errors are not erased but marked with an 'x' for future reference (Figure 2). At the end of the interview, the team take a photograph of the whiteboard. This serves as a record of the proceedings and provides a useful aide memoire for reflecting on and learning from mistakes made during the interview. The process allows for gaps in their knowledge to be filled prior to sitting the final written examination.
- Starting from the left, the first team member is asked an opening question. This is usually a general question such as 'what was the most enjoyable/challenging part of the project?' and is aimed at putting the student at ease. The interviewer moves back and

forth between other members of the team with each student getting the opportunity to answer multiple questions. This process allows a student to ‘recover’ from a previous question that was poorly answered.

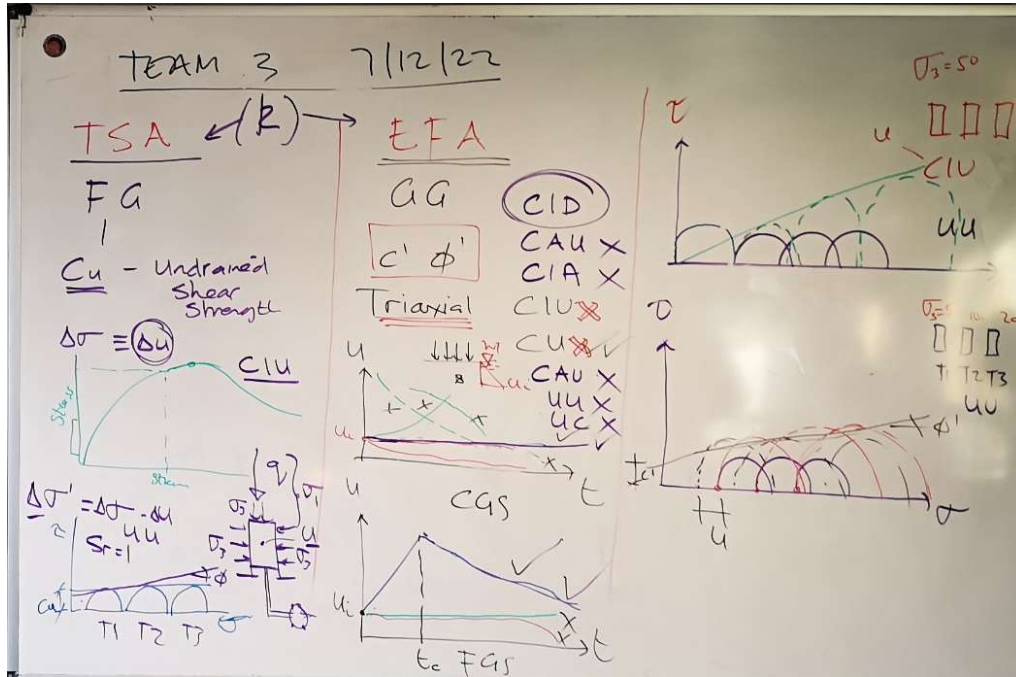


Figure 2: Record of student board notes generated during the interview

The interview lasts 35 minutes, with 30 minutes allocated to questioning and 5 minutes for grading at the end of the interview. The interview targets all levels of Bloom’s taxonomy for cognitive skills [18]. This is done to provide a rigorous evaluation of the students learning and to prepare them for a professional career where evaluation and creativity will be required to solve new and unfamiliar problems. It is important to emphasise that the interview is discussion based and not a series of sequential closed form questions taken from the syllabus. Because of this, every interview depending on the line of questioning followed takes on a life of its own.

4 RESULTS

Student feedback on interview-based assessments has been gathered from the graduates over the first ten years of the programme [19] and reveals that the interview process can be quite stressful for students, but it is seen as being fair and equitable evaluation tool. The students view it as a means of rewarding consistent work throughout the project to build their knowledge and understanding of the engineering concepts posed by the trigger. They also acknowledge that the experience improves their confidence when communicating in public. Moreover, after participating in multiple interviews throughout the programme, their ability to think on their feet dramatically improves; both sets of skills are seen as important attributes to succeed in the world of engineering.

In the graduate feedback [19], it is interesting to note that graduates working in consultancy indicated a 22% higher preference for the inclusion of additional technical interviews on the programme compared with their peers working on site (n = 60). This is not necessarily surprising given the nature of work undertaken in a design office compared to site-based activities which deal with the implementation of the design through project specifications and drawings.

5 DISCUSSION AND CONCLUSION

Interviews represent a versatile and pedagogically robust assessment strategy in engineering education. It aligns with the professional bodies' emphasis on the development of communication skills, ethical reasoning and reflective practice. The interview also offers a mechanism for verifying the authenticity of student engagement in what has become an AI-assisted learning environment. Although implementation challenges exist, innovations such as group interviews and structured rubrics provide viable pathways for effective and equitable evaluation of learning. Future research could explore empirical outcomes of interview-based assessments and the development of enhanced scalable models that maintain rigor and inclusivity.

The following are the main conclusions from the UL experience conducting interview-based assessments over the past fifteen years:

- The group interview has improved the robustness of evaluating student learning – it removes reliance on a written 'group' submission which may have benefitted from the work of one or two dedicated peers within the group, the use of AI technology or both.
- The group interview has improved the efficiency of evaluating of student learning. It has been employed successfully to cater for increased class sizes. Typically, cohorts of up to 130 students have been interviewed and graded within an eight-hour period by two interviewers working independently.
- In group interviews, the students are graded individually but the process provides an opportunity for the group to benefit from peer-to-peer learning as they listen to colleagues' dialogue with the interviewer.
- Students find the process stressful but are happy that it exists as it rewards students that work consistently throughout the project and make a positive contribution to the submission document(s). Students that do not engage in the process generally fare poorly in the interview; having not spent the necessary time to assimilate the body of knowledge required to successfully complete the project. In the words of a former graduate, 'there is simply no place to hide' if you cannot answer the question.

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