Authentic Assessments: Preparing Undergraduate Computing Students for a New Future of Remote Internships

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Abstract

It is accepted practice now in higher education in Ireland that assessments should be designed to assess the learning outcomes of a module and the skills needed for professional practice. Due to the current demands and challenges of remote working, employers are looking for a new set of employability skills where graduates can work autonomously and network remotely. Authentic assessments are an opportunity to produce 'remote work ready' graduates for this new working environment. However, authentic assessments can be decontextualised if they are designed without considering both academic outcomes and industry/real-world activities. The following practitioner case study reviews the research literature on authentic assessments. An authentic assessment framework design is outlined to bridge the gap between learning and teaching outcomes and industry expectations. This paper describes the redesign of an assessment practice at TU Dublin following a proposed authentic assessment framework design model. It discusses how the proposed model can help practitioners design authentic assessments to enable computing students to develop and articulate their transversal skills, while preparing them for a future of remote working. Recommendations from this case study can inform and shape the current TU Dublin assessment culture and the IMPACT Community of Practice as a sustainable, authentic assessment practice.

Introduction

In March 2020, the World Health Organisation classified Covid-19 as a global pandemic, society went into lockdown, and students in work placements had their internships irreversibly disrupted. Fortunately, for students in the IT sector, the shift to remote working was relatively seamless. 95% of third-year students of a B.Sc. in Business Computing degree at TU Dublin were able to complete their work placement in a remote setting. Looking beyond the Covid-19 pandemic, the landscape for IT-based internships is set to be transformed. In Ireland, the Government has announced its intention to legislate for the rights of employees to request to work remotely (Department of Enterprise, Trade, and Employment, 2021). This government intention and the emergence of remote working hubs are pointing in the direction of remote working becoming a permanent offering in Ireland. Remote working has been hailed as a key element of the fourth Industrial Revolution (Schwab, 2017). In response to this, there is a need in higher education to ensure that students are 'work-ready' for this new technology-driven, remote working environment. How can authentic assessments help students overcome the challenges of remote working, while also helping them to articulate their transversal skills into their future professions?

I have been a computing lecturer and internship coordinator for the past five years in the Faculty of Business at TU Dublin. Previous to this I spent 15 years in industry as a software developer, IT consultant, and project manager. When my third-year computing students had to move their internships to remote working as a result of the pandemic, I wanted to find a way to better support my students in this new working environment. Students were initially anxious and very concerned about the shift to remote working. Luckily the majority of our computing students were able to continue their internships remotely and not miss out on the networking and career development opportunities associated with internships. Student reflective work placement blogs highlighted their challenges in adjusting to a new working world of remote communication, remote collaboration, and autonomous working. In response to this, I redesigned one of my module assessment practices for the following semester to be a more authentic, sustainable assessment that interfaces and connects to the target workplace.

As part of my assessment redesign, I developed a framework that builds on the recommended design themes of an authentic assessment outlined in the literature (Ashford-Rowe et al. 2014; Gulikers et al. 2004; Villarroel et al. 2018). The framework aligns these themes with industry project management principles of success around the 3 P's of people, process, and

product/performance. I have shared my learnings from my assessment redesign with other teaching practitioners through a HEA IMPACT-funded Community of Practice (CoP) at TU Dublin. Communities of Practice are "groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly" (Wenger-Trayner and Wenger-Trayner, 2015). In TU Dublin the 'Authentic Assessment' Community of Practice is a group of practitioners who share ideas and practices around designing assessments to be more aligned with what students will do in their professional lives via 'real world' tasks carried out in a meaningful context. This paper and proposed design framework should help shape the IMPACT CoP Authentic Assessment framework and help other teaching practitioners in their assessment redesign to be more connected to the workplace.

Authentic assessments should be designed through both an academic and industry lens to bridge the gap between learning and teaching outcomes and industry expectations. Courses that are more enterprise-focused and that can quickly adapt to emerging developments in enterprise are features of an agile curriculum. In Ireland, national policy is currently focusing on an agile curriculum with large investments by the HEA for courses that are more innovative and agile (O'Shea, 2020). This practitioner case study looks at the redesign of an assessment practice in a B.Sc. Business Computing module at TU Dublin. The assessment redesign is in response to the emerging and future skills needed for remote working. The students participated in the redesigned group assessment the semester before they started their remote internships. The revised assessment created an environment that closely replicated a remote workplace environment, while enabling students to develop and articulate their professional skills, like teamwork, collaboration, communication, and digital work skills. The assessment used a collaborative learning space and an industry-based online environment to help create a real work environment. Pedagogical theories, assessment and feedback practices, authentic assessment design themes, and industry tools and frameworks utilised in the proposed authentic assessment design framework are discussed in the literature review section.

Literature Review

A New Future of Remote Internships

Due to the Covid-19 pandemic, working remotely is now mainstream and is starting to become the expected norm for remote internships (Jeske & Linehan, 2020). Before the

pandemic, growth in online education, advancements in remote-work technologies, diversity of the workforce, and the need for flexibility in location and time were key drivers of remote internships (Jeske, 2019; Pittenger et al., 2021). Research carried out in Ireland in October 2020 found that 94% of participants would like to work remotely after the crisis (McCarthy et al., 2020). However, remote working can be an autonomous experience where employees are not seen daily by their colleagues. From a remote internship perspective, students can become socially isolated if they are not self-motivated and do not proactively collaborate and communicate with their virtual teams. In addition to the traditional internship requirements of discipline-specific and transversal skills, students now need to have a new set of remote employability skills. In response to remote working students now need to be proficient and professional on video conferencing technologies, social media technologies, messaging systems, and remote collaboration tools as well as skills in flexible timetabling, remote networking, strategies for self-management tasks, and desktop research (Arruda, 2020; Dallon Adams, 2020; Gill, 2020). This is against a backdrop of employers favouring graduates with job-ready skills above discipline-specific knowledge (Gill, 2020). Higher education institutions need to understand how this new set of employability skills associated with remote working can be incorporated into the curriculum. Authentic assessments are an opportunity to assess these employability skills in a safe environment that allows students to become proficient in these remote technologies and skills.

Assessment Practices (OF/FOR/AS learning)

Assessment, teaching, learning, and feedback are all part of the same pedagogical process with assessment and feedback activities encouraging students to link different aspects of their learning. Boud (1995, p36) highlights that "assessment is the most significant prompt for learning". It is essential to students' learning that assessment practices are fit-for-purpose as assessment strategies shape student learning and feed forward into employability skills (Robinson et al., 2020). In higher education institutions, assessment practices can run from high stakes to low stake assessments, which is referred to as the Assessment OF, FOR, and AS Learning. Assessment OF Learning is normally summative, expressed in a grade, and usually happens after the task. For example, high-stakes graded exams, essays, or projects. Assessment FOR Learning is normally formative and gives feedback on learning and teaching. It assesses where students are in their learning, where they need to go next, and how to get there (Swaffield, 2011). It is normally low-stakes and includes activities like written and oral feedback, peer assessment, and self-assessment. Assessment AS Learning is where

students learn to self-monitor and critically evaluate their work or the work of their peers by using exemplars or rubrics. HEIs have highlighted that there is too much of a focus on Assessment OF Learning or summative assessments, where students focus more on their grades than on what they have learned (HEA, 2012). In Ireland, 61% of 487 of HEI modules profiled contained summative exams (National Forum, 2016a). This paper highlights the need for assessments to be a careful mix of Assessment OF, FOR, and AS Learning to be fit-for-purpose and sustainable. We need to shift our focus back to students as learners rather than on measurements and grades.

Adopting formative assessment approaches, such as Assessment FOR and AS Learning, has been highlighted in the literature as a way of encouraging a more sustainable, life-long learning approach (Boud & Falchichov, 2006). According to the National Forum (2021) in their framework of student success, enhancing Assessment OF/FOR/AS learning is a key driver of student success. To do this, teaching practitioners need to create assessment practices that encourage higher-order thinking processes instead of rote memorisation. If we want to change these behaviours of memorising content rather than comprehending it, we need to be willing to redesign our methods of assessment to be more engaging formats that encourage "deeper understanding and higher-order thinking" processes (Ashford-Rowe et al., 2014) and increase student engagement through partnership (Healy et al., 2014). There is a drive to redesign the assessment culture in higher education institutions to include themes such as authenticity, partnership, and sustainability. Authenticity has been identified as a key characteristic of assessment design that links student learning with their professional careers and promotes work-ready graduates who are global citizens (Herrington et al. 2014; Wiggins, 1990).

What is an Authentic Assessment?

There are a variety of definitions of an authentic assessment offered in the research literature. Common themes in the definitions include the importance of designing a challenging, cognitive, and valued task (Ashford-Rowe et al., 2014; Gulikers et al., 2004; Mueller, 2006; Villarroel et al., 2018) carried out in a high fidelity context (Gulikers et al., 2004; Wiggins, 1990) that encourages student collaboration (Ashford-Rowe et al., 2014). These tasks should be a simulation of a "real-life situation that could confront students in their internship or future professional life." (Gulikers et al. 2004, p.69). In essence, educators should try to create assessments against a context where students must show what they know using their

higher-order cognitive skills instead of lower-level thinking skills as described in Bloom's Taxonomy (1956). We need to encourage students to create and evaluate instead of recall and describe. Authentic assessments can be a vehicle to allow students to demonstrate these higher-order levels of thinking.

Authentic assessments are seen to sit on a continuum or a spectrum of authenticity (Gulikers et al., 2004; Mueller, 2006), which ranges from a truly authentic assessment that reflects a real world professional scenario to lower levels of authenticity, such as, applied question in a traditional exam (National Forum, 2017). Universities try to incorporate these real world professional scenarios into the curriculum through work placements, internships, apprenticeships, and work-based projects. Engagement with these types of real world scenarios sits at the higher end of the authentic assessment continuum. In Ireland, increasing work placement integrating into higher education programmes is being driven by national policy objectives. The Department of Education & Skills in 2017 has set a target to increase the number of Higher Education students undertaking a work placement or work-based project as part of their course by 25% by 2021. Wiggins (1990, p.1) defines authentic tasks as "involving ill-structured challenges and roles that help students rehearse for the complex ambiguities of the 'game' of adult and professional life". This paper aligns with this definition highlighting the importance of alignment of authentic tasks with professional life activities like communication, collaboration, and teamwork.

Authentic Assessment: Benefits and Challenges

The benefits of authentic assessment can be broken down into the benefits for students, teaching practitioners, and employers. A review of the literature on authentic assessment outlines the key benefits of authentic assessment for students as active student learning (Villarroel et al., 2018; Wiggins, 1993), development of higher-order cognitive skills (Ashford-Rowe et al., 2014), empowering and engaging students (National Forum, 2017), improvements on self-regulation capacity (Swaffield, 2011) and improvements in reflective practice (Crocker, 2013). Students in higher education institutions come from diverse backgrounds bringing with them a wider range of experiences and skills. Authentic assessments attempt to embrace this diversity by assessing both discipline-specific and professional skills in a social context that encourages student collaboration and peer learning. These engaging and diverse assessments align with the principles of universal design and inclusive assessments for students (National Forum, 2017).

Authentic assessments offer several benefits to teaching practitioners over traditional assessments. They are a real world practice-based model that aligns the goals of learning and teaching outcomes with industry expectations. Ajjawi et al. (2020) have highlighted the importance of this explicit alignment between student, university, and industry to students' perceptions of assessment authenticity. They argue that an authentic assessment that is carefully designed can offer scaffolding to students to broker between university and industry practices. Assessments that prompted students to incorporate aspects of their current and future selves were seen as more authentic. Improvements in academic integrity in assessments have been highlighted in the literature as a benefit of authentic assessments. According to Sotiriadou et al. (2020), assessment of learning outcomes in the target environment can reduce plagiarism and contract cheating issues associated with open book exams and ensure good academic conduct. Other benefits to teaching practitioners include the reduction of student over-assessment and reduction in the number of assessments that need to be administered. The assessment load for students should be manageable, too much assessment can lead to a lack of deeper engagement and poor class attendance (National Forum, 2016a). Higher weighting can be given to authentic assessments as they provide multiple avenues for students to demonstrate what they have learned. They also offer the opportunity for more integrative assessments across modules. Fewer assignments to assess can make more time available to lecturers to give more formative feedback on assessments.

In professional interviews, employers look for evidence from students of their skills and capabilities that are transferable to the world of work. Employers have expectations that graduates are 'work-ready'. Authentic assessments help students frame and articulate their transversal skills from higher education activities into target professions. Authentic assessments that are tightly coupled with real world tasks are a vehicle to showcase to potential employers the students' transversal skills like working autonomously (Swaffield 2011), problem solving (Sambell, 2019), communication, collaboration, and teamwork (Mueller, 2006). This strengthens the link from higher education into industry and helps address the industry need for graduates who are resilient, adaptable, and able to collaborate and communicate in remote settings.

Ensuring that assessments are authentic can bring with it several challenges. Resource issues such as cost, time, and complexity of authentic assessment have been highlighted in the

literature (Lombardi, 2007). However, Wiggins (1990) has highlighted that the costs associated with time and money are deceptive and that the "gains to teacher professional development, local assessing, and student learning are many" (p.2). However, unlike traditional assessments, grading authentic assessments can be subjective as teachers we are evaluating higher-order skills which are not as objective to grade as lower-order skills. Therefore, grading is dependent on who is judging the authenticity (Guilkers et al., 2006). Another challenge has been the resistance of students due to the emphasis on group work in authentic assessments (Bohemia & Davison, 2012).

Authentic Feedback

Feedback and assessments are core to several theories of learning, for example, Kolb's experiential learning theory (1984). Winstone and Boud (2020) argue that feedback and assessment need to be disentangled, as policy and practice are blurring their unique purposes. Correctly linking assessment practices and feedback with the student's learning can be critical as they are at the core of the student's learning experience. In this case study assessment feedback should resemble the way it is delivered in the workplace, which is a timely, specific two-way conversation that focuses on performance, not personality, and is measured against a target goal. Dawson et al. (2021) provide a framework for authentic feedback that builds on the Villarroel et al. (2018) model of authentic assessment. In the Dawson model, authentic feedback has five dimensions: realism, cognitive challenge, affective challenge, an evaluative judgment, and enactment of feedback. These dimensions when built into the assessment design of modules are seen as a way of enabling students to act on the feedback given making it more engaging and more impactful for students.

Traditionally in higher education feedback is delivered after a task has been completed. The timing of feedback in the curriculum has been criticised for being back-loaded as it does not allow the students to act on the feedback and address the gap. In industry, a popular model for feedback is the GROW model which stands for the **g**oal, the **r**eality, the **o**ptions (to close the gap), and the **w**ay forward. The way forward is the most important aspect of this model and can be seen in an educational setting when we refer to feed-forward where feedback is something that learners act upon (Hattie & Temperley, 2007). It is the actions that the students take after the feedback and the closing of the gap that makes the feedback powerful (Sadler, 1989). In some industries line managers, mentors, and peers can provide employees with feedback in a 360-degree feedback model. In these situations, employees get a chance to

act on this feedback before their next performance review to close this gap. To prepare students for this reality it is important to engage them on both teacher feedback, peer- and self-feedback tasks promptly and allow them to engage and respond to the feedback. In our assessment design process, if we can encourage the student to assess their work and that of the work of their peers, it can enhance their metacognitive processes (Ashford-Rowe et al., 2014), while also giving them clarity on how to take action on the feedback and close the gap.

The second crucial element of feedback is making feedback specific to provide clear guidelines and support to students on how they will be assessed. In an assessment context providing students with an assessment rubric is not only an effective way of giving specific feedback but also a transparent way to clarify what is expected in the assessment task(s). Sambell et al. (2019) refer to this as opening the "black box" of assessment and letting students into the assessment process to make evaluated judgments on their work. Rubrics are a way to clarify what is expected in an assessment task, and lend themselves to being tools for Assessment AS Learning, enabling student's feedback literacy. A rubric gives a list of the criteria that are the characteristics of the learning task. Each criterion is assessed by different levels of quality of the work demonstrated. When rubrics are shared with the students in advance of the task, there can be a shared understanding of what is required and what a successful assessment is. To include students in the co-creation task of the rubric criteria can influence levels of activation of student's learning strategies and self-regulation of learning (Fraile et al., 2017) while engaging students as partners in the learning process.

Proposed Framework for Authentic Assessment Design

Authentic assessments combined with authentic feedback are an opportunity for students to develop their professional selves while also developing the new set of employability skills needed for remote working. A review of the literature of authentic assessment has highlighted the importance of designing assessments that are cognitively challenging tasks that reflect real-world scenarios carried out in a high fidelity context. These tasks should encourage student collaboration and feedback literacy. A proposed framework for designing authentic assessments that are more connected to the workplace is outlined in Figure 1. This framework builds on the recommended design principles of authentic assessments as outlined in the literature review (Ashford-Rowe et al., 2014; Gulikers et al., 2004; Villarroel et al., 2018). The framework maps the key dimensions of an authentic assessment with three industry pillars of project success: people, process, and product/performance, to ensure sustainable

enhancements of students' professional success. The three pillars are aligned with teaching and module learning outcomes and wrapped in feedback and evaluation.
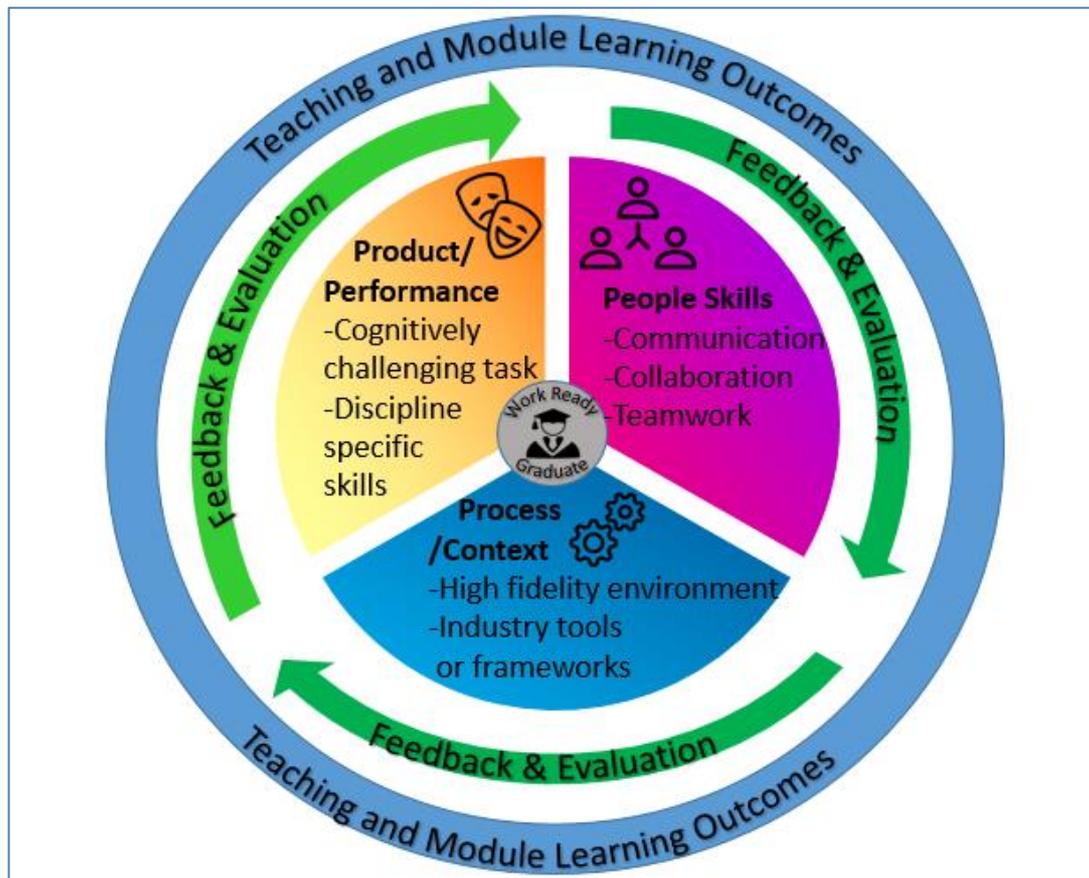
Figure 1: Industry-Focused, Authentic Assessment Design Framework

The assessment redesign described in the next section of this paper has three main goals. First, it outlines how the proposed authentic assessment framework was used to redesign an assessment in an undergraduate Business Computing programme in TU Dublin to be more connected to the target remote workplace. Second, it highlights how implementing this model can help prepare students for the new world of remote working while also allowing them to showcase their transversal skills. Finally, it highlights recommendations for other teaching practitioners to help them ensure that their assessments are sustainable, authentic assessments.

Assessment Redesign

The targeted assessment was a real-world business problem with a set of 'live' customer requirements for an online product ordering and stock control system. The participants were 52 students in their third year of a B.Sc. in Business Computing undergraduate degree studying a 5 ECTS *Business Modelling* module at the Technological University Dublin. The

three pillars of a successful software project: people, process, and product/performance were aligned with teaching and module learning outcomes (Table 1). Feedback on the authentic assessment was delivered via an analytic rubric. The learning outcomes (LO) of the Business Modelling module under discussion are outlined below:

LO1: Articulate business goals through using the use of modelling techniques.

LO2: Critically evaluate techniques for establishing the requirements of a system.

LO3: Design and develop a business computing system using Agile processes and UML notation to meet user requirements.

LO4: Liaise and communicate effectively to customers, business owners, and IT professionals in the development of systems.

	Pillar & LO	What is it?	Skills	Authentic assessment task
Feedback via an Assessment Rubric	**People** (LO 4)	Demonstration of Professional/ Transversal skills.	Communication Collaboration Teamwork	Video demo of the product Document collaboration Online team meetings
			Metacognition	Peer-/self- Assessment
	Process (LO 1 & 2)	An environment that has high fidelity and accuracy to the real work environment.	Project management skills & working with industry tools and frameworks	Use of Agile SCRUM Framework. Bongo Video Assessment tool as a remote collaboration and communication workspace. Use of industry tools like JIRA (project management) and GitHub (code repository)
	Product/ Performance (LO 3)	Demonstrate discipline-specific skills that are connected to prior knowledge. Should be a challenging task.	Computer programming skills.	Piece of working software that meets the customer's brief.

Table 1: Authentic Assessment Design using the proposed Industry-Focused, Authentic Assessment Design Framework

Tools and Frameworks

The remote group assessment project deployed encouraged the students to build a community and connections within their group to complete the assessment. The assessment created an environment that closely replicated the remote workplace environment. The tools used for remote collaboration and project management were the same tools used in the workplace, GitHub and JIRA respectively. The group collaboration and communication tool used was the university's virtual learning environment (Brightspace) which includes a video assignment and virtual classroom platform (Bongo) to allow teams to communicate synchronously and asynchronously, collaborate on documents, and video assignments, and schedule meetings. It is similar to other industry online collaboration tools such as Slack and Microsoft Teams.

People

When designing an authentic assessment it is important to consider how the students can demonstrate their social competencies and professional skills, such as communication, collaboration, and team working skills. Group projects are an ideal way to do this. There are several benefits of getting students to undertake group projects such as peer learning (Boud et al., 1999), social skill training (Johnson et al., 1981) encouraging deep learning, and developing professional life skills (Drury et al., 2007). Ensuring that the assessment is sufficiently complex encourages students to draw on each other's knowledge and fosters collaboration. For teachers, group projects can reduce marking time and encourage more efficient use of resources (Mellor, 2012). In this case study, students were preassigned to groups to ensure diversity in the groups and reduce the likelihood of groupthink that can happen when students select their groups with their friends. Group members nominated one Agile SCRUM master per team. This is the person on the team that manages the process (similar to a project manager). Throughout the semester the students were encouraged to work in their assigned groups for in-class online activities instead of randomly assigned break-out rooms. Bruce Tuckman (1965) in his group development theory suggests that groups go through four stages of development: Forming, Storming, Norming, and Performing. Making available class time throughout the semester for the groups to work together was a way to scaffold the teams to become more cohesive, task-focused, higher-performing teams.

Process

One of the learning outcomes of this module was the ability to use the industry-standard project management framework, Agile SCRUM, to design and develop a working software application. The Agile SCRUM framework focuses on self-organising, cross-functional teams, collaborating to plan the design and development of a product. The process is iterative so that it can embrace changing customer requirements. Beck et al. (2001) in their *Agile Manifesto* highlight that to create better software, project management frameworks need to focus on practices that value people, customer input, flexibility, simplicity, reflection, and face-to-face communication. This focus on self-organising teams that collaborate has become increasingly important in industry and academic programmes. The Agile SCRUM framework is not only popular in software development but in other industries such as marketing, engineering, construction, pharmaceutical, and financial organisations and most recently in education as seen in the Agile Curriculum (National Forum, 2021).

As part of the 'process' pillar in the assessment design, an environment that had high fidelity and accuracy to the target work environment needed to be created. The Bongo video assessment tool in the university VLE (Brightspace) was used to create this environment. This is an online, collaborative workspace environment that students had the opportunity to use throughout the semester. At the beginning of each online class, the group SCRUM master (i.e. project manager) would set up a 15-minute meeting to occur in class for the group to work on their group activity, similar to a group breakout room session. Schnitzer (1993) highlighted that for authentic assessments to be effective students must be allowed to practice with the form of assessment before it is used as a formative assessment. In response to this the current case study built in two lab classes where students carried out a mock group project that was similar to the actual assessment as part of a lab activity. This allowed the groups to practice the implementation of the project management framework inside the online VLE workspace environment.

Product/Performance

Mueller (2006) describes authentic tasks as "an assignment given to students designed to assess their ability to apply standard-driven knowledge and skills to real-world challenge". Authentic assessments are contextualised tasks where students are engaged, productive citizens creating solutions to real-world problems. The product or performance that the student must build or demonstrate should replicate a challenge that they would face in the real

world. Students needed to design, develop and build a real-world working software solution that correctly addressed the customer's requirements. The project management framework to manage this process was the Agile SCRUM framework, but students could self-organise and pick any software programming language of their choice to develop their working product.

A demonstration (demo) of the end product was to be delivered by the team via a video-based recording of their working software. Students recorded their product demo via webcams and screen-shares in the Bongo Video platform within the VLE and uploaded videos to the platform. The videos were then merged into one team video for submission. The video submissions allowed students to work on their presentation, communication, and digital skills (Hawley, 2020) while accommodating different learning styles, supporting learner diversity, and reinforcing learning through repeated takes of their presentations (Alpay & Gulati, 2010). Video-based assessment tools like Bongo allow teachers to give feedback, grade and analyse student videos.

Assessment Feedback

Feedback and grades were given to the students via an analytic assessment rubric to incorporate Assessment AS Learning principles. The rubric was in the form of a matrix with six assessment criteria and three expected performance standards (*excels requirements, meets requirements*, and *does not meet requirements*) for each assessment task. The rubric was aligned with module learning outcomes and with the three industry pillars of a successful project (people, process, and product/performance) with an emphasis on the transversal skills of communication, collaboration, and teamwork under the 'people' pillar. Students had the opportunity to do a test run of the assessment in a mock assessment that was run two weeks before the actual assessment. Feedback on the mock assessment was given orally to groups of students during class time and examples of good assessments were highlighted. These feedback sessions on the mock assessments were recorded in the VLE allowing students to go back over the recordings to reinforce key messages. Running this mock session was an opportunity for the students to receive feedback on their group performance and to use the feedback in the next iteration of the assessment to close the gap between the assessment goal and the reality of their performance as a team. This iterative process is one of the cornerstones of Agile Scrum software development and is how it would happen in industry practice while also incorporating Assessment AS Learning strategies. In the actual assessment, students were

also required to give feedback on their performance and that of their peers via a separate peer- and self-assessment form.

Discussion

Due to the current demands and challenges of remote working industry has expectations for graduates who can work autonomously and network remotely. Graduates need to understand their professional purpose and the demands of their future careers by being self-aware, adaptable, and confident (Bates et al., 2019). This professional purpose means that students need to understand the mindset and employability skills required for working in a remote environment. Higher education practitioners face challenges in how they will incorporate these new employability skills into their curriculum. Practitioners need to create assessments that encourage higher-order thinking processes that interface and connect to the workplace. This review of the most up-to-date literature on authentic assessment identifies opportunities for practitioners to assess this new set of employability skills using an authentic assessment framework that is underpinned by industry principles of project success. Although it is the first iteration of this authentic assessment framework, feedback from the students on the framework has been positive and enthusiastic. They found it a useful tool to help them prepare for their internship interviews and their target remote internships.

This case study attempts to contribute to the debate of what is an authentic assessment by aligning the key dimensions of an authentic assessment as identified in the literature (Ashford-Rowe et al., 2014; Gulikers et al., 2004, Villarroel et al., 2018) to the three pillars of a successful project in industry - people, process, and product/performance - as a blueprint for an authentic assessment for practitioners that ensures sustainable student success. The framework consists of four questions that it recommends teaching practitioners should consider when designing an authentic assessment that is more connected to the workplace:

(1) People: What transversal/professional skills will the assessment showcase?
(2) Process: Is the assessment environment accurate and does it have high fidelity to the real work environment? Are tasks situated in a real-world context?
(3) Product/Performance: Does the assessment task challenge students and require them to use skills that are connected to curriculum learning outcomes, student's prior knowledge, and the target work environment?

(4) Feedback: How can practitioners encourage the student to assess their work and that of the work of their peers, while also giving them clarity on how to take action on feedback and close the gap? For example, incorporate a rubric, exemplars, and/or peer feedback into the assessment practice. In addition, is there an opportunity for students to practice with the form of assessment before it is used as a formative assessment?

Conclusion

Given the recent emergence of remote internships, there is a need for teachers in higher education to be able to design authentic assessments through both an academic and industry lens. The framework described in this paper is an agile and flexible tool and can be used to help practitioners in other disciplines and contexts redesign their assessments to be more authentic, sustainable, and industry-focused assessments. It also enables students to develop and articulate their transversal skills into their future professions. As this is the first iteration and implementation of this industry-framed, authentic assessment framework it will require ongoing refinement. The next phase of this project would involve a student evaluation to be carried out on students' perceptions of the authentic assessment and its relevance to their current work placement tasks concerning the pillars of people, process, and product/performance. Feedback from the student evaluations will be incorporated into the next iteration of the framework to ensure sustainable enhancements of students' professional success.

Higher education is increasingly being challenged by industry and employers to produce graduates who can address the current challenges of the workplace. Students need to be equipped with skills that that will enable them to become global citizens who can adapt to a changing and disruptive world. Now more than ever students' professional skills, as well as their discipline-specific skills, are in higher demand. Students need to be able to showcase these transversal skills in the conversations that they are having with potential employers. An industry-focused, authentic assessment design model gives them the scaffolding to frame these conversations. This case study argues that curriculum designers should review the extent that the assessments we require our students to undertake, prepare them for interviews when they are seeking employment and prepare them for the target workplace. Recommendations from this practitioner case study can inform and shape the current TU Dublin assessment culture and the IMPACT community of practice as a sustainable authentic assessment practice.

Acknowledgement

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