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2022-09-20

Empowering Responsible and Sustainability-Aware Business Graduates Through Digital Authentic Assessment

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Recommended Citation

Walsh, L., Freeman, O., McAlpine, A. and McMahon, C., 2022. Empowering Responsible and Sustainability-Aware Business Graduates Through Digital Authentic Assessment. Presented at the International Conference on Sustainable Development, 20th September 2022. DOI: 10.21427/P6CC-YS42

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Empowering responsible and sustainability-aware business graduates through digital authentic assessment

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Abstract

Business schools must engage in fundamental change to retain their legitimacy and position themselves as providers of solutions to urgent economic, social and environmental crises[1]. Achievement of the UN Sustainable Development Goals (SDGs) has emerged as a megatrend[2] and business education must enhance graduate skills to contribute to their achievement. The world requires the next generation of graduates to become responsible business leaders[3] who will address wicked sustainability problems[4]. Hence, we need pedagogy that enables students to become sustainability literate and thus develop appropriate knowledge, skills and mindsets.

Authentic assessment provides transformative learning opportunities that empower students to achieve meaningful impact in the real world[5]. Despite some recent research that connects authentic assessment and sustainability[6] [7], there is a dearth of empirical research on authentic assessments for sustainability in business disciplines[8]. We outline a pedagogical initiative designed with the aim of enhancing sustainability literacy among business students using innovative digital tools as part of authentic assessment strategy.

We designed and implemented authentic assessment strategies that engage students with learning across a number of different delivery modes and in a 'deep' reflective manner[9] with meaningful tasks. Business students on undergraduate, postgraduate and executive programmes follow the same format with some adjustments made to reflect the different discipline/module focus. This includes completion of: (i) a sustainability literacy test through the UN supported Sulitest platform[10], (ii) a written reflection on learning, stemming from the Sulitest that utilises the DIEP reflective model[11], (iii) the creation of digital artefacts such as a short video shared on LinkedIn; student activism involving contacting political representatives/brands; creation of social media content in partnership with sustainability-focused organisations; podcasts with invited guests; writing of opinion pieces for media; and creation of e-portfolios tat showcase student's work.

We believe this deep reflection and awareness signposts efficacious action emerging from our transformative learning pedagogy, based digital authentic assessment design. This pedagogical approach equips students with sustainability specific knowledge, global citizenship skills, digital skills, and creative and inquisitive mindsets.

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INTRODUCTION

Contemporary critique of business schools raises fundamental issues about their role, purpose and legitimacy. Yet, as the collective consciousness of our environmental impact grows, one emerging raison-d'être reflects a need to develop future business leaders that can navigate the socio-ecological intertwine with their business activities. The main challenge with this development stems from the transformative nature of sustainability knowledge embedded in the super-wicked problems that business leaders are required to address. This knowledge is, itself, rapidly evolving and sometimes self-conflicting. Consequently, even the basic steps of acquiring sustainability literacy require transformative learning pedagogies that provide opportunities for deep reflection, criticality, systems thinking and a future orientation.

Authentic assessment offers potential for providing these opportunities by facilitating the application of theory to real life scenarios. One of the benefits of authentic assessment is that it immerses students in the learning experience, encouraging them become self-directed. Students also typically become more motivated to become producers (as opposed to solely receivers) of content are incentivized to actively participate in their learning, broadening and deepening their knowledge. In this paper, we highlight the role of authentic assessment strategies in the development of sustainability literacy.

We begin with the evolving role of the Business School and the disruptive challenge to its legitimacy by the emergence of Education for Sustainability (ESD), mandated in higher education. We point to the consequential transformation of business education from its traditionally narrow shareholder focus on profit maximisation to one that is more stakeholder-inclusive and to the growing imperative to ensure Business School graduates are sustainability literate. We then explore the transformative learning process and its relevance to the development of sustainability literacy. Moreover, we examine authentic assessment as a tool for transformational learning in the development of sustainability literacy. We then detail the authentic assessment strategy used in the Faculty of Business at TU Dublin, which included the deployment of a sustainability literacy test as an awareness-raising tool, the provision of the DIEP (Describe, Interpret, Evaluate and Plan) framework for facilitating reflection, and the creation of a digital artefact as a catalyst for advocacy, action and activism. In concluding, we note its profound impact on students, including a sense of empowerment to become changemakers.

BACKGROUND

The Role and Legitimacy of the Business School

Against a backdrop of corporate scandals and financial crises, questions have been posed about the legitimacy of business schools in contemporary society[12] [13] [14]. They face pressure to be better guardians of public interest[15] and they are scrutinised for how the curriculum can encourage future leaders to behave responsibly[16] [17]. Such scrutiny brings criticism of business education for teaching 'dominated by influence of an instrumental rationale of achieving specific profit-maximizing goals'[18]. Yet, there is also growing demand from a range of stakeholders, including from students, accreditation and ranking bodies and employers, for a greater focus on

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sustainability within management education[19] [20]. Such developments, have led to calls to broaden the business school curriculum to include sustainability beyond traditional corporate social responsibility[21], and to extended it to a socio-ecological mindset[22].

Business schools' role in enhancing students' sustainability literacy

Sachs et al.[23] identify education as an area for transformation. The UN points out, 'meaningful … change in the conduct of corporations toward sustainability must involve institutions that directly act as drivers of business behavior, especially academia'. Target SDG4.7[24] refers to the skills and knowledge that are necessary for a sustainable future. More specifically, SDG4.7.1 indicator focuses on measuring the extent to which countries mainstream global citizen education (GCE) and education for sustainable development (ESD) in curricula and in student assessment[25] [26]. Business education is making progress on reshaping its curriculum in pursuit of developing responsible business leaders and global citizens[27] [28]. Although transformative in nature, ESD does not fit well with existing rules-based knowledge domains and ESD facilitators and learners must "reassess the structure of assumptions" that frame their thinking[29].

Transformative Learning

Mezirow[30] defines transformative learning as 'the process of effecting change in a frame of reference', through 'critical reflection of assumptions, validating contested beliefs through discourse, taking action on one's reflective insight, and critically assessing it'. Nerstrom's[31] Transformative Learning Model supports the process through four sequential phases: (a) experiencing something; (b) making reasonable assumptions; (c) challenging related perspectives, and; (d) revealing a new experience leading to the transformation. It depicts how learning transformations are constructed, suggesting that once transformative learning occurs, individuals become more receptive to experiencing it again and less likely to revert to prior ingrained beliefs. Closs and

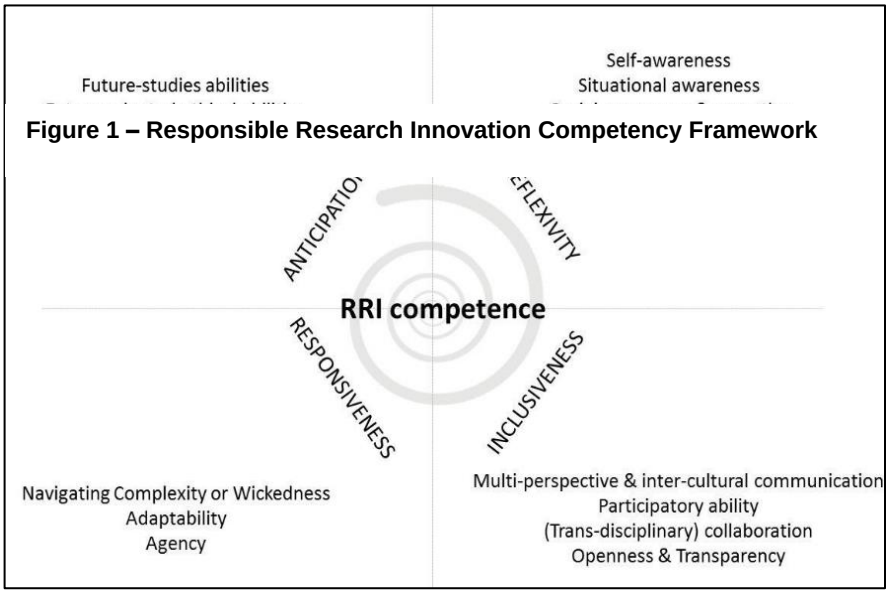


Figure 1 – Responsible Research Innovation Competency Framework

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Antonello[32] argue that management education for sustainability is inherently transformative, thus reflective and situationally interpretive. The Responsible Research and Innovation (RRI) Perspective[33] offers a practical guide to educators to redesign their curricula based on principles of education for society, with society and to whole persons. The RRI competence framework (Fig. 1) built around anticipation, reflexivity, responsiveness and inclusiveness contributes to solving the pedagogical puzzle of how to engage students in transformative learning in the context of sustainability knowledge that is rapidly evolving, sometimes conflicting and difficult to action.

Sustainability Literacy

We adopt Décamps et al.'s[34] definition of sustainability literacy as "the knowledge, skills, and mindsets that help compel an individual to become deeply committed to building a sustainable future". Implicit in the definition is multidisciplinarity, interconnectedness of knowledge domains and systems thinking. The definition is also supported by ESD initiatives that seek to identify essential dimensions for consideration when embedding sustainability in higher education curricula and is consistent with SDG 4.7. with regards to the development of graduates as empowered global citizens and change agents within their organisations.

The term 'sustainability literacy' was initially coined to encourage 'buy in' from the corporate world[35] and it followed a host of other literacies, such as media literacy, financial literacy and computer literacy. In the same way that proof of a minimum level of English is required for admission to some universities, employers are likely to require graduates to have a basic understanding of global sustainability challenges and their responsibility in resolving them. Yet, the infantile integration of sustainability literacy in business education has been fraught with challenges[36]. Aragon-Correra et al.[37]maintain that business schools are still searching for appropriate teaching resources across knowledge domains. There are few synopsised evidential knowledge products that facilitate students in grasping global citizenship and responsible leadership concepts[38].One recent and promising exception is the GreenComp framework[39] that specifically focuses on developing sustainability competencies related to 'knowledge, skills and attitudes to think, plan and act with empathy, responsibility and care for our planet.

Authentic Assessment as a Tool for Transformational Learning & Enhancement of Sustainability Literacy

In recognising the transformative nature of sustainability literacy, we propose that its development can be enhanced by the inclusion of a strong reflective dimension and real-world engagement through authentic assessment. Authentic assessment aims to replicate the tasks and performance standards typically found in the world of work' and is typically cognitively challenging, reflective and evaluative[40]. Through authentic assessment, students are also building their global citizenship and employability skills such as motivation, communication, critical thinking, that appeal to future employers[41]. Employers were found to mostly value communication, content creation, safety and problem-solving digital skills among graduates[42]. It is reasonable to assume that Gen Z, as

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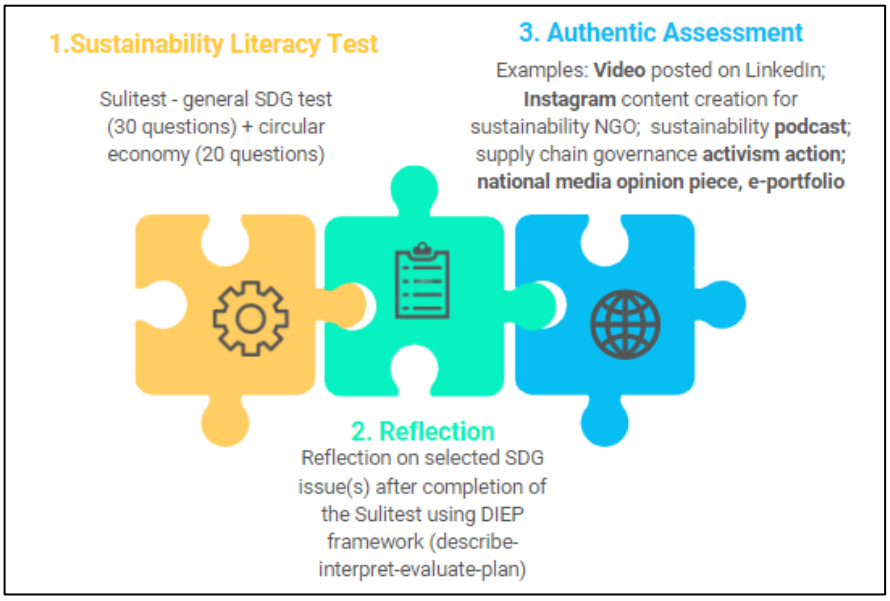
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digital natives, have well-developed digital competences. However, Salesforce's survey[43] found that this is not the case as while 64% of Gen Z respondents felt comfortable with personal use of social media, only 31% believed that they had the advanced level of digital skills required by employers. As business educators, it is our responsibility to embed opportunities to enhance digital skills into authentic assessment.

TU DUBLIN SUSTAINABILITY LITERACY TRANSFORMATIVE LEARNING THROUGH DIGITAL AUTHENTIC ASSESSMENT

Technological University Dublin engages 28,000 students in research-informed, practice-led education across a range of disciplines from apprenticeships to PhDs. The vision of the university is to 'Create a Better World Together'. The current strategy was developed through the lens of the UN SDGs and out of this emerged three interrelated strategic pillars – People, Planet and Partnership. Key performance indicators (KPIs) include global citizenship education, sustainability as part of all programme outcomes, decarbonisation and multi-disciplinary research collaborations to tackle global challenges[44]. We received funding from the National Forum for the Enhancement of Teaching & Learning in Higher Education[45] in 2020 to pilot embedding sustainability literacy into assessment across 16 modules/courses in the Faculty of Business. Figure 2 summarises our approach to enhancing sustainability literacy for transformative learning through digital authentic assessment that have been designed and implemented by the authors. Business students on undergraduate, postgraduate and executive programmes follow the same structure with some adjustments made to reflect the different discipline/module focus. This includes completion of: (1) the Sulitest - a sustainability literacy test[46], (2) a written reflection on learning stemming from completing Sulitest based on the DIEP reflective model[47] and (3) the creation of a digital authentic assessment artefact.

Figure 2 – TU Dublin Sustainability Literacy Transformative Learning Through Digital Authentic Assessment



Step 1 – Sustainability literacy test

All students first complete a sustainability literacy test – Sulitest[48] Its architecture is based on four themes: [1] sustainable humanity and ecosystems, [2] human-constructed systems to meet people's needs, [3] transition towards sustainability and [4] roles for systemic change. The questions are structured around general sustainability knowledge, skills and mindsets. The Sulitest has made a vital contribution to integrating sustainability literacy in higher education and in 2021, 42,000 users completed the Sulitest. In TU Dublin, the numbers increased from 150 in 2018/2019 to 3,900 in 2021/2022 academic year.

[43] Salesforce, 2022. Global Digital Skills Index 2022. Available at https://public.tableau.com/app/profile/salesforceresearch/viz/DigitalSkillsIndex/CountryDB?publish=yes
[44] TU Dublin 2030 Strategic Intent. Available at https://www.tudublin.ie/explore/about-the-university/strategicintent/2030/
[45] The National Forum for the Enhancement of Teaching and Learning in Higher Education supports enhancement of teaching & learning in Irish Higher Education https://www.teachingandlearning.ie/
[46] Sulitest.org
[47] Boud, D., Keogh, R., & Walker, D.,2013. Reflection: Turning experience into learning. Routledge.
[48] Sulitest. UN/Unesco supported sustainability literacy platform. Available at https://www.sulitest.org/en/index.html

This activity is not graded and we view Sulitest as a powerful tool for raising awareness of sustainability issues in a broad range of contexts for each student. Each student complete the main test which consisted of 30 general SDG-related questions and further 20 questions based specifically on the circular economy. As students complete each question, they receive instant feedback, which includes a detailed answer to the question posed as well as links to supplementary resources, of which students are encouraged to take note as they progress through the test.

Step 2 – Reflection

The students are then asked to complete a reflection using a four-step approach based on Boud et al.'s[49] DIEP (Describe, Interpret, Evaluate and Plan) framework. DIEP acts as a guide to organising reflective writing, with four added prompts: (1) *Description* involves answering questions around what was read, viewed or heard; (2) *Interpretation* involves making connections between new information and connecting it to pre-existing knowledge, thoughts and feelings to generate meaning and garner insight; (3) *Evaluation* requires the students question the value of their experience and, in doing so, develop considered opinions in relation to new learning; and (4) *Planning* involves consideration of ways in which the learning experience might be transferable across student's wider programme of study and their personal and professional lives, more generally. DIEP places a strong emphasis on questioning deeply rooted assumptions and future action, which is particularly suited to the transformation-orientation of the sustainability agenda.

Students choose to reflect on 1 – 3 issues of interest raised in the Sulitest. The reflections demonstrated deep engagement and transformational impact on the students. In terms of knowledge, the students discovered that the UN SDGs encompass a broad range of social and environmental issues which questioned their previously narrowly-held views of what sustainability was. More significantly, the students' emotions came through ranging from anger, disbelief and shock to the feelings of being privileged and belief in their own active role in positively contributing to solutions. The change of mindsets was most visible in the 'plan' part of the reflections where the students pledged to changed behavior and advocacy in their sphere of influence including their personal lives and future professional orientation. This is just one example of the impact of the Sulitest and reflection: '*I have learned so much about sustainability through Sulitest. It has expanded my knowledge on sustainability, which I previously had almost little to no knowledge on. It has made me aware of my future and how harmful us humans are to our planet and it is truly horrific. As a relatively young adult, I want to use this knowledge to build a sustainable future for this world not just as a citizen, but as a hopeful future manager'.*

Step 3 – Digital *Authentic assessment Artefact*

The last part involves of the authentic assessment involved the creation of a digital artefact. Table 1 provides a detail overview of a sample artefact types that different student cohorts with TU Dublin's Faculty of Business were required to create. Variations of these digital artefacts were created by undergraduate, postgraduate and MBA students in modules/courses such as International Management, Strategic Marketing, Global Business, Enterprise Sustainability, Supply Chain Management, Consumer Behaviour, Business Sustainability & Sustainable Supply Chain Management.

Table 1 – Digital Authentic Assessment Artefact Examples

Digital Authentic assessment artefact	Details	Examples
Short video shared on LinkedIn	The students created a short 3 minute video linking their chosen SDG issue to selected industry and ending the video with actionable recommendations. They shared the video on LinkedIn to create engagement and impact. The	• Food waste in restaurant industry • Living wage issues of garment workers in fast fashion industry • Mental health issues in construction industry

[49] Boud, D., Keogh, R., & Walker, D.,2013. Reflection: Turning experience into learning. Routledge

	students also engaged with each other's posts creating additional peer-to-peer learning.	• Marine life endangerment due to ocean acidification & microplastics
Instagram content creation	In collaboration with a sustainability NGO called 'The Useless Project' that has over 47,000 followers REF), the students created Instagram content around a chosen SDG issue outlining the issue with added consumer actions at the end. The NGO chose a number of posts to be published on their Instagram.	• Period poverty • Circular materials in construction industry • Fast fashion as a feminist issue • How to recognise greenwashing
Podcast on SDG related issue	In groups, students chose a topic that connected SDGs and international management practice. They created a 15 mins podcast episode in a conversational style with an option to invite a guest. Call to action was communicated at the end.	• Cross-cultural diversity • Forced and child labour in garment industry • Conversion of heat waste in data centres into heating of local areas • Gender equality in tech industry
Activism action piece	Supply chain governance - the students were tasked to investigate where the responsibility in relation to the particular SDGs lies in the supply chain. They contacted either a brand or a political representative to enquire about a particular issue of concern. The students then also created a short video based on learnings from the previous task.	• Examples of brands that were contacted: Zara, H&M, Misguided, Intel • Examples of government organisations contacted: Green Party, Government of Ireland political representatives, local authority
Opinion piece	Students wrote an opinion piece on one SDG related issue using RTE Brainstorm (national media broadcaster,REF) journal article guidelines. One student's work was selected and published online.	• Advertising industry and sustainable era of consumerism[50] • COP26 – what it means for future of business • Business leadership in transition towards net zero
Creation of e-portfolios	Using Wix, final year students were encouraged to showcase and curate their digital artefacts and other pieces of assessment/reflections.	• The students created diverse and engaging portfolios with their work including images and videos. Some students used it when searching for graduate employment.

Most of the students engaged in creation of these authentic digital artefacts for the first time and thus we needed to support them adequately. We carefully scaffolded their learning experience by creating very detailed briefs, guidelines and assessment rubrics, tutorials and instructional videos on how to use particular digital tools, engaged with relevant partners and provided ongoing feedback.

Students' reflections and informal conversations revealed the transformational impact this authentic assessment had on them. Apart from gaining actual sustainability literacy knowledge and skills, their mindsets were also transformed. The students gained a sense of empowerment, realization that their voices can have real impact and they became more confident in changing their own habits, advocating for change within their sphere of influence and engaging in activism. Their digital skills were also enhanced significantly as they learnt how to design and communicate complex information appropriately through visual, audio and video channels to specific audience. Many of the students set up their LinkedIn profile for the first time, which was well-timed with their upcoming internships/graduate jobs.

The impact of the 3-step authentic assignments has been significant for us as educators and academic activists, too. We have proven that sustainability literacy through authentic assessment can indeed ensure transformational learning for our students - future leaders and global citizens. Students' success and evidence of transformative learning impacted on us positively too and motivated us further to continue to innovate. We have been sharing our experiences with other peers in our own business and non-business disciplines to empower them to innovate in their own modules and we have been learning from others too. Hence, we co-

[50] Hyland, C. and Freeman, O., 2022. Is advertising ready for a more sustainable era of consumerism? https://www.rte.ie/brainstorm/2022/0512/1297575-advertising-industry-climate-change-sustainability/

founded SDG Literacy, a community of practice[51][52] that has extended to include colleagues from multiple disciplines such as chemistry, food science, engineering, culinary arts, tourism and languages. It comprises of a group of peers who share interest in enhancing sustainability literacy and interact regularly in sharing practice and collective learning.

CONCLUSION

Business school education is undergoing rapid transformation to position itself as part of the solution to urgent social, economic and environmental crises. More specifically, it is in search of pedagogy to enable students become sustainability literate. In this paper, we detailed authentic assessment pedagogical initiative designed to enhance sustainability literacy among business students using innovative digital tools as part transformative learning. We discussed the use of the UN supported Sulitest platform as an awareness-raising tool that directs students to further information on a broad suite of sustainability related topics. We highlighted the crucial role of structured reflective writing in the transformative learning process. Finally, we outlined some of the digital artefacts created by students that accelerated their transformation towards action orientation and the impact the assessment had on the students and ourselves as educators too.

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