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Embedding Sustainability across a Teacher Education Course: Teacher Educator Experiences

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Abstract

Education for Sustainable Development (ESD) remains an urgent priority to combat the numerous social, environmental and political crises prominent in the 21st century. This article shares the experiences of teacher educators who integrated ESD into discipline-specific units of study for pre-service teachers. Using a collaborative auto-ethnographic approach, we explore how curriculum change for ESD was navigated and discuss how institutional support was essential for providing legitimacy and necessary resources. Drawing on Noddings' approach to ethics of care, we emphasise the significance of valuing the perspectives and experiences of stakeholders involved in curriculum change and advocate for inclusive and responsive approaches that engage individuals meaningfully throughout the process.

Keywords: Collaborative auto-ethnography; ESD; sustainability; teacher educator experiences

Introduction

The need to embed Education for Sustainable Development[1] (ESD) across all levels of education was recognised over 50 years ago at the International Union for Conservation of Nature (IUCN) Conference on Environment and Conservation Education. At this time, progressing environmental education in primary, secondary and teacher education was fore fronted on education agendas (International Union for Conservation of Nature & Natural Resources, 1972). Since then, we have seen a commitment by the United Nations, declaring 2005–2014 as the 'Decade of ESD' (UNESCO, n.d.-b), and in 2015, advocating education as a key driver for achieving all 17 sustainable development goals (UNESCO, n.d.-a) alongside explicit educational targets 'that by 2030 all learners will have the necessary knowledge and skills to promote sustainable development' (United Nations, 2019, section Goal 4 targets 4.7). Even the World Economic Forum advocates the importance of 'climate education' (Ramirez, 2020) and ESD (Diop & Jain, 2020).

In Australia, ESD is present in the policy context at all levels of the education system. The Alice Springs (Mparntwe) Education Declaration emphasises the need to prepare young people for a changing world (Education Council, 2019). The Early Years Learning Framework encourages integrating sustainability into early childhood education (Australian Government Department of

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[1]For the purpose of this article, we use the term education for sustainable development, though recognise that it is interchangeable with education for sustainability. We acknowledge the existing fruitful debate regarding definitions that surround these terms and those similar (Kidman et al., 2020; Redclift, 2005).

Education, 2022), and the 'sustainability cross-curriculum priority' in the Australian curriculum commits to embedding sustainability principles from Foundation to Year 10 (Australian Curriculum, Assessment and Reporting Authority [ACARA], 2016). While such mandates are to be celebrated, critiques abound (e.g., Barnes et al. (2019); Dyment and Hill (2015)), revealing that the translation from policy to practice is patchy and disparate at best, and absent in schools and across the education sector more generally. Further, ESD is not included in the Australian Professional Standards for Teachers (APST) which govern accreditation (Australian Institute for Teaching and School Leadership [AITSL], 2017), and therefore, can be easily overlooked by initial teacher education (ITE) providers (Evans, Stevenson, Lasen, Ferreira & Davis 2017). Tertiary education occurs in the context of the Talloires Declaration, which is supposed to serve as a unifying platform for universities dedicated to environmental sustainability, outlining a comprehensive 10-point strategy that encompasses integrating sustainability into teaching, research, operations and community engagement (University Leaders for a Sustainable Future, 2020). Though, it appears that the Talloires Declaration is being utilised more as a means for universities to *signal* their commitment to ESD, rather than as a framework to guide institutional transformation (Zutshi & Creed, 2018). While ESD appears in Australian education policy frameworks, educators continue to face challenges in effectively integrating sustainability into educational practices (see Bosevska & Kriewaldt, 2020; Dyment et al., 2015; Salter et al., 2013).

Globally, it is recognised that without supporting educators to develop competencies in ESD, it becomes challenging to envision how they will empower their upcoming students to cultivate the essential skills needed to address sustainability challenges like climate change and poverty (Evans, Inwood, Christie & Ärlemalm-Hagsér 2021). Mulà and Tilbury (2023) argue that teacher education is an important catalyst for leveraging innovation and redesigning learning opportunities across the education system (p. 5). Yet, even with supposed encouraging policy conditions (Brandt et al., 2019), a review of four decades of ESD found ITE and professional learning of teachers in the field lacking (UNESCO, 2018), with inadequate teacher training identified as a primary issue (Ferreira et al., 2014; del Carmen Pegalajar-Palomino, Burgos-Garcia & Martinez-Valdivia 2021).

Like others (Davis & Davis, 2021; Eames, 2022; Evans et al., 2021; del Carmen Pegalajar-Palomino et al., 2021), we recognise that an implementation gap exists between what is advocated for in policy and how this is put into practice on-the-ground in ITE courses. In this paper, we offer our experiences – as teacher educators in a Bachelor of Education (Primary) – of embedding sustainability into an ITE course. We hope that by sharing our journey, we contribute towards bridging the gap between policy and practice. We offer our learnings which may be useful to others working in ITE contexts (and beyond) seeking to embed ESD in higher education.

Literature review

While research and policy suggest embedding ESD is a priority, it remains sporadic and under-realised in teacher education globally (Eames, 2022). To better understand why this may be the case, we first consider constitutions of sustainability in education and teacher education specifically, and review the barriers to successful integration of ESD as well as the elements from the literature that indicate success. We highlight the structural and individual dimensions that influence ESD integration and build the argument that for integration to be successful, moving beyond either/or top-down mandates and bottom-up activities is needed.

Constituting ESD

Sustainability, akin to concepts like art and justice, is often contested, lacking a universally accepted definition (Gallie, 1955). This complexity arises from divergent ontological and epistemological perspectives across disciplines and ideologies, complicating efforts to define and

implement ESD (Gale et al., 2015). Further to this, the global dominant paradigm – sustainable development (Lafferty & Eckerberg, 2013) – is underpinned by sustaining (economic) growth, recognising nature as a form of capital (Adelman, 2017) and resource conservation as means to perpetuate human development. Thus, the very definition advanced by the pioneering Brundtland report Our Common Future reflects an anthropogenic view of sustainable development as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (United Nations World Commission on Environment & Development, 1987). While a detailed analysis of the concept is beyond the scope of this paper, it is important to highlight the controversy in definition and the effects of the taken for grantedness of anthropogenic framings in policymaking for sustainable development (Holden et al., 2014) in the education system.

The result of definitional obscurity in the field has meant that a variety of principles intended to guide ESD implementation are available. The Australian Research Institute for Environment and Sustainability (2009) identified *envisioning a better future, critical thinking and reflection, participation, partnerships for change* and *systems thinking* as five key principles of Education for Sustainability. In a report on issues and trends in ESD for UNESCO, an emphasis was placed on content relevant to equipping teachers to teach for and about contemporary sustainability challenges and included poverty reduction, biodiversity loss and sustainable consumption (Leicht et al., 2018). Equally, intended to guide ESD, competencies including embodying sustainability values, embracing complexity, envisioning and acting for sustainability have been identified as a sustainability competence framework in Europe (Bianchi, Pisiotis, Giraldez, Pisiotis & Cabrera Giraldez 2022).

In their sensemaking of ESD, Kidman, Chang, and Wi (2020) review the field and propose a theoretical framework that highlights ESD as 'a process that motivates and engages people in creating sustainable futures' (p. 5). This points to education needing to do more than merely transmit knowledge, but rather, ontologically and epistemologically engage with what it means to be and act sustainably in the world. Therefore, to fully embed ESD, integration should encompass programmes, the institutional vision and pedagogical practices (Evans, Ferreira, Davis & Stevenson 2016). However, achieving this is challenging (Albareda-Tiana, García-González, Jiménez-Fontana & Solís-Espallargas 2019; Eames, 2022; Evans, Inwood, Christie & Newman 2023).

Approaches to embedding ESD in teacher education

Integrating sustainability education in ITE, like other courses, often hinges on either top-down or bottom-up initiatives. Top-down strategies involve policies and directives from governing bodies or institutions, while bottom-up approaches focus on grassroots efforts initiated by communities or individuals. Both approaches can contribute to advancing sustainability education, with top-down methods recognised for providing institutional support and resources (Evans et al., 2023; Falkenberg & Babiuk, 2014; Ferreira et al., 2007), and bottom-up efforts fostering local engagement and innovation (Evans et al., 2023). Integrating the strengths of both approaches is essential for creating comprehensive and inclusive sustainability education programmes (Parnell, 2016; Sterling, Maxey & Luna 2013).

In this vein, embedding ESD in teacher education is most successful when initiatives are responsive to the socio-political, geographical and cultural contexts of place and institution and can lead to sustained systems change (Evans et al., 2021; Evans et al., 2016). Conversely, teacher education programmes with insufficient strategic and professional development support for academics (Davis & Davis, 2021), a lack of leadership at the faculty level (Falkenberg & Babiuk, 2014; Summers, 2013), time and resource allocations to deliver change (Albareda-Tiana et al., 2019; Mills & Tomas, 2013; Sims & Falkenberg, 2013) and siloed disciplinary content (Eames, 2022; Evans et al., 2017) tend to be less successful in integration efforts.

The European Sustainability Competencies Framework evidences a decreasing emphasis on disciplinary-based knowledge needs and instead encourages learning that engages with values, complexity, possibility and action (Bianchi et al., 2022). In their edited book on the integration of SDGs in diverse formal and informal education contexts, Beasy et al. (2023) showcase how community connections and collaborations enrich the integration of ESD teaching. However, throughout the more than 40 chapters, minimal evidence of interdisciplinary and multiple-goal experiences was discussed. This highlights the many challenges that exist for educators who must first recognise and disrupt disciplinary silos, to unlearn and re-learn what teaching and learning can be (McLeod et al., 2020).

While structural support and strategic direction are integral to curriculum change initiatives, the motivations and commitments from individuals should not be underestimated and are equally as fundamental to integrating ESD (Almeida, Moore & Barnes 2018). Predominantly, curriculum transformation in support of ESD remains undertaken by those with content knowledge about sustainability (Evans et al., 2017). Grassroots efforts and motivated staff members – who bring their personal, lived experience and ethical perspectives – are essential to achieving ESD and play a pivotal role in launching and coordinating sustainability goals (Warr Pedersen et al., 2017; Grabs et al., 2016). They are individuals, and often personal activists, who are change makers in terms of product, process, or method within an organisation (Anderson & Bateman, 2000). They are often known for risk-taking, the possession of referent power, being 'heroes', and having courage, passion, commitment, persistence and an identification with a societal cause (Anderson & Bateman, 2000; Bosman, 2021; Hedman & Henningsson, 2016).

Communities of Practice (CoP) can offer space for such individuals to engage in peer directed professional development, sharing and learning with colleagues of shared interests (Warr Pedersen, 2017). As a mechanism for enabling collaboration and cross-disciplinary approaches, which are known as effective strategies for enabling sustainability initiatives in higher education (Annan-Diab & Molinari, 2017; Jones & Galloway, 2015), CoPs offer a loose structure and a potential way of bridging the top-down/bottom-up binary (Sterling et al., 2013). However, key strategies needed before such initiatives can be successful are building trust and rapport (Sims & Falkenberg, 2013) and having a shared language to speak with (Siedlok & Hibbert, 2013). In what follows, we introduce our research context and explain how we approached our particular curriculum change activities.

Research context

The University of Tasmania (UTAS), which forms the context of this study, is committed to environmental, economic and social sustainability and its effective implementation – including integration in the curriculum – and is a signatory to the Talloires Declaration (https://ulsf.org/96-2/#Australia). Sustainability is one of the key areas of the University's Strategic Plan and Strategic Framework for Sustainability. Some examples of this commitment include being certified carbon neutral since 2016, and achieving divestment from fossil fuel-exposed investment funds in 2021. UTAS was named the Sustainability Institute of the year at the Green Gown Awards Australasia 2021 and was highly commended the following year in the same category of the International Green Gown Awards; ranked 5th in the world by the 2023 Times Higher Education Impact Rankings for its performance against the United Nations Sustainable Development Goals (SDGs), and 1st (for the second year running) in relation to SGD 13: Climate Action (Jack, 2023).

The School of Education is likewise committed to ESD, as explicitly referenced in the Bachelor of Education course objectives (UTAS, n.d.), and in the recent ESD-focussed academic appointments and development of new courses. However, as noted in the literature (Evans et al., 2017), teacher education programmes remain constrained by accreditation mandates which has necessitated innovative solution-seeking of integrating ESD meaningfully into existing course design.

In 2021, the School of Education initiated the creation of an internal service role, termed the Sustainability Curriculum Facilitator (SCF), aimed at promoting ESD integration within its ITE courses. The lead author of this paper assumed this role for a 12-month period and during this time undertook curriculum mapping of the school's offerings, orchestrated a school-wide roundtable session to enhance staff awareness of ESD and assisted teacher educators in integrating ESD principles into their teaching. The SCF worked with school leadership and teacher educators to embed ESD throughout the degree programme, thereby enabling pre-service teachers to experience sustainability-related curriculum in diverse curriculum areas and with diverse pedagogical approaches (Evans et al., 2017). The SCF centred care in interactions with colleagues and the work of Noddings (1984) was used to theoretically inform her approach.

In recognising care as a pivotal aspect of human interactions (Noddings, 1984, 1988), and the importance of trust and rapport in ESD initiatives (Sims & Falkenberg, 2013), the SCF established a relationality that was conducive to trust, openness and experimentation (Hagenauer, Muehlbacher & Ivanova 2023). In the context of education, Noddings (1984) advocated that caring should form the foundation of interactions between teachers and students, wherein teachers attentively listen, anticipate needs and nurture students' intellectual and personal growth.

Noddings (1988, 2012) identified three key attributes essential for fostering a caring teacher-student relationship, including engrossment, commitment and motivation, which were embodied in the SCF's ways of working. While the SCF did not take on the role as 'teacher', the attributes identified by Noddings were helpful in supporting the operationalisation of an ethic of care in practice. For instance, the SCF was 'engrossed' in the experiences and backgrounds of her colleagues and exhibited a 'commitment' to listen, seek to understand and accept ideas of those looking to embed sustainability into their teaching. And finally, the SCF was 'motivational', prioritising colleagues' needs and aspirations rather than her own.

Three teacher educators were open to exploring how ESD could be embedded into their teaching and worked with the SCF in the form of a collaborative auto-ethnographic study to reflect and make sense of their experiences of doing so. At the time of writing, the four participants in this research, including three teacher educators and the SCF were all working in the School of Education, with a balanced teaching and research load. Below, we provide some background on our contexts, as well as the discrete units (subjects) that are discussed in the context of our experiences of integrating ESD in this paper.

Jessie, the SCF, is a Senior Lecturer with a disciplinary and teaching background in geography and environmental sustainability. Over the last decade, they had been teaching and researching across education contexts (formal and informal) to support transformational change and sustainable futures.

Sidney has worked in ITE over the past decade in a range of units in Bachelor of Education degrees. Their teaching is now focused on supporting entering ITE students to develop the necessary skills to successfully complete their studies and graduate as effective teachers. Sidney's research interests are divided into two areas, under the theme 'education equity, access and experience': 1) scholarship of teaching and learning, and 2) Languages education.

Peyton is a Senior Lecturer in English Education. They have coordinated a number of English and Literacy units for the Bachelor of Education and Master of Teaching courses, as well as played a major role in the university initiative to equip undergraduate students across Schools and Colleges with knowledge and understanding of global sustainability and local responses in the Southeast Asian region.

Darcy is a lecturer with a disciplinary and teaching background in Design and Technologies. Past research focus has included the importance of the nexus between theory (ITE) and classroom practice in order to enhance ITE programmes and student experience.

The units below are core units in the Bachelor of Education (Primary) degree, and each teacher educator is the Unit Coordinator - the top-level role of delivering a unit.

Academic literacies: This unit, co-ordinated by Sidney, is meant to be studied in ITE students' first semester of their first year in their degree (and is thus offered in both Semester 1 and 2). As a mandatory introductory generalist unit, it provides essential skills in the areas of: communication; academic reading, writing, researching and referencing; and the required system skills for the utilised learning platforms and software. As students in most courses must enrol in this unit, it was identified as a logical first touchpoint for introducing ESD.

Foundations of English: This mandatory curriculum-specific unit, co-ordinated by Peyton, is offered in Semester 1 of students' first year and is also offered during summer school (after Semester 2). This unit includes two modules with the first focusing on the nature of language, culture and how young people learn to use language from birth, and the second provoking curiosity about language functions and forms, text types and their role in culture and society.

Design and technologies: This mandatory unit, co-ordinated by Darcy, is scheduled as a first semester second year curriculum-specific unit. Students focus on development and creation of an authentic classroom task which showcases the design process of the discipline.

Methods

Research design

We utilised collaborative autoethnography as an appropriate methodology to investigate the experiences of embedding ESD into an existing ITE course (Hains-Wesson & Young, 2017; Nairn et al., 2015). The research question - 'how do teacher educators experience integrating Education for Sustainable Development into ITE?' framed the investigation.

A collaborative autoethnographic approach was adopted to enable recognition of researchers as participants in a shared community and experience (Chang, Ngunjiri & Hernandez 2016). This approach enabled an in-depth exploration of a phenomenon from an insider's experiential perspective, while the inclusion of multiple voices and perspectives added rigour to autobiographical interrogation (Chang et al., 2016). The study was underpinned by an interpretive paradigm (Smith, 2008) that emphasises understanding human experience by exploring its underlying meanings, purposes and interpretations (Morehouse, 2012).

In recognition of the contested nature of ethical considerations in such research, the teacher educators as participant-researchers engaged with ethical principles including obtaining voluntary consent to participate by all group members and ensuring that all participant-researchers were comfortable with the representation of personal reflections and conversations in this manuscript (Chang et al., 2016; Forber-Pratt, 2015; Guyotte & Sochacka, 2016; Lapadat, 2017). The process of generating data is adopted from the concurrent autoethnographic approach developed by Chang et al., (2013), where the authors themselves become the subject of research. In this approach, all the researcher-participants actively took part in creating individual written reflections and engaging together in critical conversation (Beasy et al., 2020). Each participant-researcher engaged in writing personal reflections about their experiences of integrating sustainability education materials into their course materials during one semester. Reflections were guided by inquiring and prompting questions: Why did you decide to integrate ESD into your unit? How do you plan to make this work? How is implementation going? What are the challenges/enablers in the implementation? How is implementation going? What are the challenges/enablers in the implementation? and, how did it go? What worked well? What would you do differently?. Reflections were collected by Author 1 and stored in a OneDrive folder shared by the team.

At the end of the semester, researcher-participants met online via Zoom (60 min) to reflect on the written materials produced and to collectively deepen insights through inquiring and questioning the experiences of each other. Through this critical conversation, the group identified challenges and drivers in their experiences as well as developed insights into how teacher educators engaged in such work could be supported in the future. Themes from the data are

presented below, followed by a discussion of how to progress the agenda of embedding ESD in teacher education degrees in ways that value and build the capacities of all staff engaged in the process.

Analysis

While collaborative autoethnography supports iterative thinking-reflecting-writing processes, Authors 2 and 3 undertook a process of thematic coding together by following the six-phase process outlined in Table 1 by Braun & Clarke (2006, p. 87). A defined approach supported our emerging understanding of the developing themes and co-construction of themes. Each phase was undertaken beginning with the reading and familiarisation of the data. Phase two involved inductively creating initial codes while going through each transcript. Phase three saw initial codes grouped by overarching theme headings and sub themes. The next phase of analysis comprised reviewing and refining codes, where similar themes were collapsed into one (e.g., 'examples', 'vehicle') and moving sub codes to be better positioned in other main codes (e.g., finding resources). Phases four and five were undertaken concurrently with the reviewing of themes, refining descriptions and the addition of names. Further refinement and interpretation of our collective experiences were refined through the process of collaborative writing (Phase six, producing the report). Additional elements undertaken beyond the phases outlined by Braun and Clarke (2006) and supported by the work of Nowell et al. (2017), included the data being analysed by more than one researcher, peer debriefing and reflexive writing through the coding process. All of these additional element's aid in establishing credibility and trustworthiness of the thematic analysis process. In referring to the data throughout the paper, we indicate the source of data in this way: written reflection (WR) and critical conversation (CC). Pseudonyms are used throughout.

Findings

In this section, we share the main themes that surfaced through the collaborative analysis process of the reflections and conversations. Four main themes emerged and included: (1) Drivers for embedding ESD, (2) Practical actions to embed ESD, (3) Enablers and (4) Challenges. We explore each in turn below before discussing their implications further in the paper.

Drivers for embedding ESD

Findings revealed that both internal and external factors motivated teacher educators to include sustainability in their units. The internal influences included benefits for students, and personal and professional alignment, while external factors comprised expectations to include ESD from the Department for Education, Children and Young People (DECYP) and the School of Education at UTAS.

Internal influences

We found that views and beliefs of sustainability, in both personal and professional settings, influenced how teacher educators engaged in embedding ESD in their units. Peyton's drive to embed ESD in teaching arose from both 'my personal way of living and awareness for the environment coupled with my professional needs' (WR), an alignment which Jessie noted during the group reflection 'seems to really help in why you were able to take this up' (CC). Darcy's personal beliefs of sustainability meant that they wanted to 'demonstrate the importance of SDGs to students' (WR) and in alignment with their professional teaching philosophy of authenticity, 'ensure the SDGs are not just added in a manner that is a token gesture' (WR). These internal

influences extended to the educators' beliefs that there were a range of benefits to students by embedding ESD in units.

In addition, each teacher educator spoke of a range of benefits to students from embedding ESD into units. All believed that giving a consistent message of the importance of sustainability throughout units was seen to help students see its significance and develop their own knowledge and understanding of the concept. This is highlighted by Darcy's statement that students need to 'make connections with an influential area that has a direct connection and impact on all, worldwide' (WR). This is expanded on by Peyton's view that 'ensuring a sustainable society and environment for our later generation is crucial and education is a powerful weapon' (CC). Embedding ESD consistently throughout learning and creating these connections aims to develop a transferable skill, which pre-service teachers can implement in their own teaching practice and educate future generations on a topic which has local and global importance.

The integration of teaching ESD concepts through other curriculum areas was also highlighted as a benefit through this study. Darcy uses their discipline-specific unit of Design Technologies to model to pre-service teachers how to integrate other curriculum areas and cross-curricula priorities, because 'if they have an opportunity to see and practice integration it will assist them in future practice' (WR). They elaborated on this idea when saying 'you want to make those connections [local through to global] so students can see the importance and the relevance of what they're doing' (CC). This importance of educating future teachers for the benefit of future generations motivated teacher educators to embed ESD in their units.

External influences

Institutional expectations for ESD were identified as external influences that motivated integration. Teacher educators were aware of the University's School of Education strategic aim (and understood by those in this paper, as a requirement), of embedding ESD. Jessie's role as the School's SCF further reinforced the perceived commitment of the School of Education relating to embedding ESD. Jessie expanded on how they interpreted this role during the reflective process:

> 'During 2021 and 2022, I took on the role for the School of Education as the Education for Sustainability Curriculum Lead. I was tasked with supporting staff to integrate ESD into their units. This included facilitating a roundtable, where a guest speaker from the Department of Education came to share how the Department approached sustainability in primary and secondary education as well as short presentations from lecturers within the School about their interpretations and inclusions in units'. (WR)

The second external influence identified was the push from the DECYP for schools to be teaching ESD, so therefore, teacher educators assumed responsibility as ITE providers, who should be modelling this and preparing graduates for the task.

Practical actions to embed sustainability

To embed ESD in units, the three teacher educators undertook a range of actions. While each took a different approach, from the data, two sub-themes emerged about practical actions undertaken, comprising ideas around opportunities and approaches.

Identifying opportunities

When looking to include new concepts into teaching, mapping was done by each of the teacher educators to decide where it would be best placed in the unit. Jessie explained that once the participant had sought their expertise,

'The process we undertook involved an initial meeting one-on-one, whereby the individual walked me through their unit, including weekly content, overall learning objectives and assessment tasks. It was at this point that through a process of co-construction and co-thinking, that opportunities within the unit to do this work emerged'. (WR)

As part of the mapping process, tensions arose regarding alignment between making ESD fit within current unit content. Darcy encapsulates this tension when saying 'I think we all talked about this in some form or another about staying true to our own units or staying true to the purpose that we have behind our unit' (CC). This demonstrates how the teacher educators did not want to force links between content and the SDGs, or feel they had to remove core content to make space for it. This tension is displayed in Darcy's comment that their 'initial thoughts on incorporating the SDG's into Design and Technologies was how to do this while retaining the core essence of design thinking' (WR). In grappling with this tension, they reflected that 'my feeling is the only way to achieve this is to embed SDG in both content and assessment, so it becomes a key element within the unit and also addresses the nexus between theory and practice' (WR). Sidney also talked about this tension of alignment when mapping ESD to unit content: 'I was a bit concerned at first at embedding ESD into my unit. As a general unit, it can sometimes be the place everyone sees everything as fitting, making it rather crowded with concepts and themes' (WR). During the reflective group discussion, Darcy synthesises this: 'we wanted to keep that essence of our unit without losing that when we added something new in' (CC). It was clear from the written reflections and critical conversation that initially, embedding ESD was seen as a threat to teacher educators' current unit goals and content, highlighting the need to make this authentic and meaningful rather than an ad hoc 'bolt on' approach to dispel such feelings. Through sitting with someone they deemed knowledgeable on ESD and mapping the unit to find integration opportunities, these reservations dissolved.

Taking an approach

Sidney and Peyton both implemented ESD in current tasks, making them the 'vehicle' for ESD teaching. In Academic Literacies, the first semester saw Jessie provide the prompts and resources for two targeted ESD essay topics. Thinking about the next semester, Sidney reflected:

'I realised I could go further with this, and link all my essay topics to the SDGs. I had already been removing topics based on lack of student engagement and difficulty, and it seemed natural to now extend this with better embedding of ESD' (WR).

This led to a more meaningful approach, with all essay topics linked to relevant SDGs, and a reflection activity for students to explain how their direction within the topic aligned. From the initial prompt from the SCF, Sidney was able to better embed ESD in their unit for the next semester. Through conversation with Jessie, Peyton identified that texts used in the Foundations of English unit for learning activities would be an appropriate place as an introductory touchpoint. Considering their method of embedding ESD, they explained 'we include ESD in this English unit through the selection of texts as I teach grammar and text types using picture books and written texts' (WR), a recognised approach (Bhagwanji & Born, 2018). Peyton did not exhibit the tension displayed by Sidney and Darcy about alignment to current unit content, as the resources for some tutorials and assessment became the vehicle for students to engage with ESD ideas.

In the second-year Design and Technologies unit, Darcy used the assessment task to embed ESD by requiring students to have 'made a connection with SDGs by linking their created design question to a relevant SDG and target' (WR). Strong integration was a key factor in the way Darcy chose to embed ESD in this unit, which is shown in the way the SDGs are taught and assessed, compared to the approach of Sidney and Peyton, who used a touchpoint approach and introduced ESD through already established activities.

Enablers

Reflections revealed two key enablers for teacher educators to embed ESD successfully in ITE units including having access to guidance and developing knowledge and confidence on ESD.

Access to 'Expert' guidance

The key enabler was the guidance teacher educators received from the SCF. This is demonstrated by Peyton's comment to Jessie 'I couldn't have done this without your support' (CC). Sidney also made a similar comment, explaining that 'Jessie really helped my own understanding' (WR) when they had initial confusion linking the SDGs authentically to essay topics. Darcy referred to Jessie as the 'centre-point' and 'common denominator' (CC) in the group, as the three teacher educators went back and forth between checking in with Jessie and developing their own knowledge. In their role, Jessie described:

> 'There seems to be this balance between guided learning. So, I guess my role in providing materials on ESD or clarifying what it is and starting points ... [while] equally important is that self-directed learning, so actually doing your own research and having the time and space to do that' (WR).

In Jessie's reflections, the importance of providing ESD-related starting points to stimulate the teacher educators' thinking about relevant connections to their units was noted. However, it was the side-by-side approach that seemed to enable successful and authentic embedding of ESD in units. Importantly, there was ongoing engagement between the teacher educators and the SCF:

> 'We set up times to get together to discuss and check in with how it was going. Opportunities to do this seemed invaluable, both in terms of maintaining momentum and reminding everyone that this was an important undertaking, and also creating a community whereby lessons were learnt and shared 'imposter syndromes' could be laughed about' (WR).

Embedding ESD into units alongside colleagues and with the help of an SCF provided strong collegiality during this undertaking, with a chance to share ideas, strategies, successes and challenges.

These opportunities for the SCF to help the teacher educators develop understanding and provide reassurance of their actions led to improved knowledge and confidence to successfully embed ESD in their units.

Developing knowledge and confidence

In the beginning, participants lacked knowledge around the concept of sustainability. Through the embedding process, Sidney explained the benefit of developing knowledge to be able to authentically present the content in the unit: 'it's been really interesting just to broaden my knowledge and really understand sustainability better' (CC). This notion of professional development to best integrate ESD into units is also demonstrated by Peyton, who said: 'it's beneficial for my own development, my awareness' (CC). The teacher educators all wanted to feel confident in what they were teaching around ESD. Developing a clear understanding of ESD was truly evident in Darcy's unit, due to the integration that occurred in both learning and assessment tasks in the unit. Sidney highlighted this when they commented to Darcy:

> 'I think out of the three of us you implemented the most and it was the most active and the students had to really engage with it. So they were asking you questions, and you had to know how to answer. Because you were explicitly teaching it and getting the students to really engage with it' (CC).

This highlights the importance of having the knowledge and confidence to engage with students around ESD, to ensure they get the correct understanding and have faith in the educator's own content knowledge.

Findings revealed that the development of knowledge led to those involved building confidence in ESD, which enabled them to effectively embed the material in their unit. This was an important part of the process and is encapsulated by Darcy's argument that 'I think it's the balance between having the confidence in your own knowledge, enough to be able to put it into your unit and feel like you have ownership of it and an understanding of it' (CC). Teacher educators also spoke about the need for confidence to respond to student queries about any of the ESD content accurately. Working alongside a SCF was found to support the development of the teacher educators' confidence. Jessie noticed that 'the individuals seemed to have a greater confidence in themselves once their thinking had been validated by me' (WR). All teacher educators noted that with greater confidence, they were willing to go further in their efforts to embed ESD.

Access to a SCF acted as the professional development bridge that teacher educators needed to build their knowledge and gain confidence to successfully embed ESD in their units. This is summarised by Sidney when they said: 'I have found this a really valuable exercise in developing my own understanding and am proud that my unit can contribute to the embedding of ESD in the SoE courses' (WR). This knowledge and confidence development suggests a sense of ownership of the content, leading to a more successful embedding of ESD in units instead of an external 'bolt on' approach which feels forced. If teacher educators do not fully understand the embedded content, then they can lack the confidence to teach it and can thus inadvertently communicate to students a lack of importance of ESD when teaching.

Challenges

While the above enablers helped the teacher educators embed ESD in their units, there were key challenges that emerged as part of the embedding process. Two key themes were identified: uncertainty, and authenticity and alignment.

Uncertainty

Reflections highlighted how teacher educators were initially unsure of the concept of ESD and where to start in terms of embedding ESD in their units. Sidney shared 'I first thought 'what can I do in my unit?'. I had very narrow-minded thinking, which related to tangible actions' (CC). A lack of understanding of ESD can be a first hurdle to thinking about how to embed it in a unit. Peyton also expressed their concern about effectively embedding ESD as 'that's actually not our expertise, or what we are teaching' (CC), suggesting a concern for teaching outside of their comfort zone. Darcy highlighted 'when I was putting this into my unit, while I was really positive about including it, I didn't know very much … I think the three of us probably felt that we didn't have a lot of background' (CC). As previously identified, personal and professional drivers led the teacher educators to this point, but uncertainty around ESD was an initial challenge. Regarding the SDGs specifically, this is encapsulated by Sidney who admitted 'the challenge was how little I knew about the SDGs and what they actually mean' (WR), so the first step was self-development around these ideas.

Participants were also unsure about where to find suitable resources, such as examples of ESD in schools, or a range of text genres on sustainability topics. This is demonstrated by Darcy who said: 'There is also an acknowledgement of the need to improve my own knowledge regarding SDGs and explore examples of best practice when implementing this concept into the classroom' (WR). This is reiterated by Peyton, who explained, 'I deliver this unit twice a year. So, for assessment tasks or tutorials, I need lots of texts … If I want to continue to do this, then I need to find more resources' (CC). Bringing ESD into units in an authentic manner with suitable resources was obviously a priority for these educators.

Authenticity and alignment

While teacher educators were keen to introduce new and relevant material into their unit, they were also concerned about the authenticity of adding cross-curricular elements. Darcy voiced this view by saying 'I didn't want it to be just a token gesture, you know, just throwing it in and having it in there, I wanted it to be part of the unit and a useful part' (CC). This rejects the notion of a top-down, 'bolt on' approach. How content is perceived by students was outlined by Darcy as an important consideration to how the embedding was performed, as 'with our students, it has to be clear, it has to be in the content, it has to be aligned to tutorial tasks ... and assessment' (CC). This comment highlights the importance teacher educators placed on ensuring any changes made to their units aligned with key aims and outcomes.

For Darcy, authenticity was achieved through ensuring examples were tangible and that students could see explicit real-world applications of the sustainability integration materials: 'it's always really powerful to have a real example in the unit so that students can see, okay, we're just not doing this to make it difficult, where it's going to apply' (CC). Embedding content this way enabled students to see the importance and relevance of ESD, not just as an additional assessment requirement.

The tension of trying to embed new concepts in an authentic manner is shown by Sidney's reflection when questioning how explicit the information about the SDGs needed to be, given the unit's focus on academic literacies. As a non-assessed learning activity, Sidney reflected that aligning the essay topics to the SDGs and highlighting this to students:

> 'Would not really help them understand the SDGs unless they chose to look into them themselves. Was this OK, though? Was it my unit's place to teach them about the SDGs, or just raise awareness of them and highlight they would engage more with them in other units? If it was my unit's place to teach about the SDGs, in how much detail? Was it going to be a natural or forced link?' (WR).

These types of questions highlight the importance the teacher educators placed on ensuring any integration of ESD was not seen by students as tokenistic or out of place, but rather, aligned with key outcomes of the unit and authentically building students' understanding of ESD.

Discussion

By collectively reflecting on our experiences, we came to recognise the interplay of an enabling structure – a SCF in the School, and the relationships formed amongst those engaged in enacting curriculum change for ESD.

The policy to practice gap remains a recognised and pervasive hole in the ESD transformation agenda (Davis & Davis, 2021; Eames, 2022; Evans et al., 2021; Rammel & Vettori, 2021; del Carmen Pegalajar-Palomino et al., 2021). Findings from our experience suggest that how change initiatives are undertaken matters to their likely success or failure. This aligns with Lozano's (2022) advice that for change to be successful, it must be adopted by a range of stakeholders and be implemented long enough to become part of the culture. Noddings (1988) reminds us that 'in every caring occasion, the parties involved must decide how they will respond to each other. Each such occasion involves negotiation of a sort: an initiation, a response, a decision to elaborate or terminate' (p. 222). As shown in our experience, enablers and barriers were an important part of navigating the embedding process. Both must be addressed, as Lozano et al. (2022) argues, 'drivers to change must be fostered, and resistance to change must be overcome, in order to institutionalise the changes' (p. 85). The journey to embed ESD looked different for each of those engaged in the process and provides a steadfast reminder that one-sized-fits-all approaches to curriculum change agendas are problematic (Evans et al., 2021). Instead, our experiences demonstrate the importance

of creating conditions where receptivity – seeing and feeling with those that are on the same journey – is central (Noddings, 2013).

A supportive structure

Establishing the SCF role through a top-down approach lent credence to the endeavour of integrating ESD into the curriculum of the School. This role symbolised institutional endorsement and recognition of the value of ESD, argued by both Falkenberg and Babiuk (2014) and Summers (2013) as being important at a Faculty level to the success of ESD integration. This was a sentiment echoed by Peyton, Sidney and Darcy, who emphasised its importance. However, we would advocate, based on our experiences, that delivering on change requires more than change to governing structures, and instead relies on action by all stakeholders to create a more comprehensive change (Weiss et al., 2021). Further, we agree that change is most aptly achieved when 'the growth of those [involved] is a matter of central importance' (Noddings, 1988, p. 221).

In finding opportunities to embed ESD into diverse curriculums, each of us needed to be open to thinking differently and *doing* differently. Oftentimes, institutionally driven initiatives have pre-determined outcomes which are not sensitive to those they *act* upon (Mazon et al., 2020). Instead, working within an ethic of care reminded us that 'true dialogue is open; that is, conclusions are not held by one or more of the parties at the outset' (Noddings, 1988, p. 223). In our interactions, the SCF needed to commit to listening (Noddings, 1988) and to be engrossed (Noddings, 1988) in the backgrounds of those seeking to transform their ways of teaching. This required each of us 'throughout a dialogue, [to be] are aware of each other . . . no matter how great [our] ideological differences may be, [we] reach[ed] across the ideological gap to connect with each other' (Noddings, 2002, p. 17). It was in dialogue and through playing with ideas that eventually, the confidence of Peyton, Sidney and Darcy grew and the co-construction of ESD teaching was realised.

Relating with care to support ESD

We found that fostering relationships through a lens of care was pivotal in cultivating an environment conducive to the openness and trust necessary to engage in change (Hagenauer et al., 2023). Within the confines of higher education, we grapple with a system that often imposes constraints, making transformative change challenging to enact unless there are shifts in the governing structures (Rammel & Vettori, 2021).

Acquiring a deeper comprehension and the capability to integrate ESD principles into disciplinary contexts bolstered Peyton, Sidney and Darcy's confidence in ESD. While existing research emphasises the significance of environmental beliefs as predictors of engagement in ESD (Almeida et al., 2018), we highlight the pivotal role of individuals in generating their own momentum through the visibility of others' practice and struggles, by fostering connections and feeling a sense of community (Bosevska & Kriewaldt, 2020; Warr Pedersen, 2017). For instance, Sidney articulated their uncertainty, stating, 'I was unsure how [ESD] is done in other courses, so I was wary of being too explicit in saying that students would find it embedded in other units' (WR). Here, we see a key element that enabled those involved - the exposure to diverse approaches of others and opportunities to work collaboratively in the integration of ESD across various units.

Implications

In this paper, our focus has been on illustrating how incremental change, leading towards necessary transformation, can be realised within a single aspect of the education system – ITE. We explored our approach to working with institutional structures to create change for ESD. While we do not offer readers anything new in terms of ESD, the insights captured here tell a story of *how*

curriculum change for ESD can be successful. We reveal the way Nodding's ethic of care was integrated into the SCF role and was used to guide ESD implementation.

Recognising the importance of access to relevant ESD knowledge and information to support integration efforts (Evans et al., 2016), we emphasise the significance of institutional support mechanisms, in this case a delegated SCF role, as crucial for the enduring success of initiatives. Our experiences demonstrate how both top-down and bottom-up approaches to change agendas can be harmonised. While institutional support is essential for providing legitimacy and necessary resources, it is vital to engage with stakeholders in a collaborative manner that acknowledges their perspectives and experiences and invites them on the journey, with space to meander on their own (but not alone) path.

Finally, we feel that we have shown through our experience one way that top-down initiatives can be implemented through Noddings' principles of care and enable the conditions for trusting in each other, sharing practice, being creative and building confidence among those engaged in the ESD curriculum integration. We believe the novelty of this work is in highlighting how top-down initiatives, when engaged through an ethic of care, can support broad ESD curriculum change agendas.

As Noddings (2012) suggests, our actions should be responsive to the unique needs and contexts of those involved, rather than adhering to rigid principles or expectations. Drawing upon Sterling's (2013) call to move beyond the dichotomy of top-down versus bottom-up approaches, we acknowledge that our efforts may not have introduced a completely novel 'third way' of governance; However, we like to think that we have revealed one way that the utilisation of existing frameworks can support change for ESD and beyond.

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