Can sustainability audits provide effective, hands-on business sustainability learning, teaching, research and assessment for Business Management undergraduates?

Introduction

For over two decades, Higher Education Institutions (HEIs) have been role models for sustainability actions and behaviours (Fredman, 2012), with campus operations regarded as sources of good sustainability practice. However, HEIs' roles are now moving beyond the promotion of basic sustainability knowledge in response to businesses' influential and growing expectation that graduates should be both employment ready and in possession of sustainability understanding (IEMA, 2014; Quality Assurance Agency for Higher Education, 2014). Employment readiness requires graduates to demonstrate employment skills and sustainability knowledge, skills, and values that meet the needs of future business leaders (Stough et al., 2018) and enable them to make responsible and ethical management decisions (Adomssent et al., 2014). Together, learning and teaching (L&T) for employment readiness can equip students with tools and techniques to feed forward into future workplaces to allow them to make a difference from within (Emblen-Perry and Duckers, 2018) which in turn may help deliver society's growing demands for responsible businesses.

To become the key player in shaping sustainable futures proposed by Disterheft et al. (2015) and Figuero and Raufflet, 2015), an HEI should exploit its' role as the link between knowledge creation and knowledge transfer (UNESCO, 2011). To do this UNESCO (2017) urges educators to radically rethink traditional approaches used in management education to encourage students to think in new ways. This requires innovative L&T methodologies that develop knowledge and skills through real world contexts to make learning engaging and, most importantly, relevant for students (Partnership for 21st Century Skills, 2007).

The author considers this innovative, engaging and relevant L&T methodology can be introduced into the business curriculum by engaging Level 6 Business Management students with business sustainability through completion of a sustainability audit of a simulated, real world case study company. This is delivered in an audit-based module, which is the focus of this study. This module, operated as a 'Living Lab'. encourages students to think in new ways by completing the audit, participating in in-class activities linked to the audit and case study and reflecting on their role within audit-based learning, teaching, research and assessment (LTRA).

This paper presents research findings from a two-year 'Living Lab' study that explores the ability of this sustainability audit to provide effective, hands on, business sustainability LTRA for Level 6 Business Management students in a real world environment. It evaluates the effectiveness of this L&T approach through an analysis of students' reflections of participating in the module against four measures of effectiveness: sustainability knowledge, graduate employment skills, life and career skills and student engagement. The findings presented provide insight into effective means and methods for hands-on business sustainability L&T, add to pedagogic discourse of Education for Sustainability (EfS) and offer experience-based guidance to educators seeking to develop immersive, active and experiential, real world learning approaches to business sustainability.

Education for Business Sustainability: the Higher Education environment

HEIs are key contributors to learning, teaching and research that will address current and future sustainability challenges within both businesses and the wider environment (Higher Education Funding Council for England, 2014; Higher Education Academy, 2015). Consequently, sustainability has been gaining standing in Higher Education (HE) curricula (Figuero and Raufflet, 2015), initially in departments of science but latterly more widely;

business curricula now see the value of promoting sustainable business futures and students' sustainability skills.

As businesses are now considered a potential force for good (Holtum, 2014), there is growing demand for Business Management graduates with sustainability skills (Stubbs, 2011). Business have come to recognise that sustainability skills are required to promote sustainable business futures such that 85% of graduate roles in the UK now require sustainability knowledge (Drayson, 2015).

Within HEIs, Business Schools are uniquely positioned to address demands for sustainability literacy through business curricula content, L&T means and methods and contribution to pedagogic discourse. However, in many cases the sustainability knowledge of the graduates does not meet these business needs (Edie, 2015; Laurinkari and Tarvainen, 2017) as EfS has not kept pace with the growing demand for business sustainability literate graduates. Along with this increasing demand for sustainability knowledge, skills and values, businesses' funding for in-house graduate training has been in long-term decline (Connor et al., 2003). Together these have placed the responsibility for equipping graduates with the effective employment skills and sustainability knowledge on Business Schools (Pegg et al., 2012) so that EfS is now evolving to become Education for Business Sustainability (EfBS).

EfBS to develop business sustainability knowledge, skills and values is now emerging into the mainstream Business School curricula and prompting pedagogic and business debate into its effectiveness. Laurie et al., (2016) advocate enhancing students' personal engagement with the challenges of sustainability that goes beyond the business perspective to foster sustainable societies. Engaging students with current real world business issues can deliver these positive social and business outcomes (Molthan-Hill (2014) and increase the likelihood students will be able to address such problems in the future (Laurie et al., 2016).

Alongside these demands for new approaches to sustainability L&T, an increasingly complex environment of HE is emerging. This learning environment is evolving and growing in complexity as students are increasingly treated as consumers of educational output Vanderstaeten, 2004; Bunce et al., 2017) and degrees a commodity (The Guardian, 2016). Within this market driven culture of HE, which demands consumer satisfaction (Woodall et al., 2014), there is pressure to become student-centric and deliver the style of teaching that students prefer whilst enhancing the student voice (Taylor and Parsons, 2011) and maximising student numbers. However, these expectations are required to be delivered within a student culture of low attendance and even lower engagement (Stoner and Fincham, 2012; Leach, 2016). Consequently, tensions frequently emerge for EfBS between the marketised culture of Business Schools and educators' attempts to develop sustainability knowledge, skills and values and employment skills (Emblen-Perry, 2018).

In addition to this changing educational environment, functional obstacles to the effective delivery of sustainability curricula, such as resource, competition and league tables, may prevent the adoption of innovative approaches to EfBS (Lambrechts and Ceulemans, 2013). But unless educators overcome these challenges Business Schools will be unlikely to deliver the rising expectation that learning, teaching and research will contribute to the development of a sustainable society (Higher Education Academy 2015; United Nations 2017).

In an attempt to overcome these cultural challenges and enhance the effectiveness of EfBS the author implemented a new learning platform, which is the focus of this study; a sustainability audit. This engages Business Management students with the principles and practices of business sustainability, develops sustainability knowledge, skills and values and employment skills by aligning LTRA to an assessed sustainability audit of a simulated real world case study company.

Education for Business Sustainability: L&T in the student environment

In the current massified and marketised environment of HE (Lynch, 2006), L&T has evolved to respond to student' preferences for participatory user interactions (Conole and Alevizou, 2010) that deliver just in time learning and employment skills in a context they find relevant and learning environment that they find meaningful (Crosthwaite et al., 2006). This is reshaping the practice of sustainability L&T (Higher Education Funding Council for England, 2014; Higher Education Academy, 2015), replacing traditional transmissive and instructivist learning and teaching with active learning with new pedagogical means and methods that students find acceptable.

In this evolving environment, educators' new methodologies should go beyond student-centred learning to include learners in the whole learning process and inspiring learning environment (Perello-Marin et al., 2018) in order to develop L&T approaches 'as learning' rather than 'for learning'. To achieve this Rieckmann (2011), Docherty (2014), Molthan-Hill (2014) and Wiek et al., (2014) advocate providing participative and reflexive L&T embedded in real world business issues to inspire students to transform their thinking and actions to promote sustainable futures (UNESCO, 2017). The author consider this can be achieved by aligning research and assessment to learning and teaching so that a module can offer cohesive and engaging LTRA.

A pedagogy for EfBS that coordinates LTRA means and methods can offer student-centred, immersive, collaborative, active learning that can challenge students' preferences for just-in-time learning by promoting engagement, which is one of the key challenges facing the HE community (Leach, 2016). The author considers an LTRA approach that promotes knowledge and skills alongside engagement and successful student outcomes can achieve a long-term transformation of students into employment ready sustainability advocates, rather than simply offering the short-term grade achievements students expect.

Adopting active learning for this LTRA approach to EfBS can drive learning from participation in meaningful activities (Dale, 1969; Prince, 2013) and offer a learner centred approach as learners think about what they are doing whilst they are doing it (Bonwell and Eison, 1991). Together these can enhance learning outcomes of sustainability knowledge and appropriate employability skills needed to promote sustainable development (United Nations, 2017), meet the needs of current employers (Foster and Yaoyuneyong, 2016) and increase retention and improved employment prospects (Christenson, Reschly &Wylie, 2012; Drayson, 2015). Active learning can also challenge students' preferences for just in time learning by requiring them to investigate and apply information, which is increasingly abundant and easily available, rather than simply acquiring it. Beech and MacIntosh (2012) suggest active learning is most effective if a problem-solving focus is adopted to promote an understanding of what to do with information rather than simply describing it. This is vital for sustainable business futures as it encourages learning for insight rather than learning for technique. Chapman and Dunkerley (2012) take this further and suggest educators should embed collaboration into the problem solving approach to promote academic effort and purpose as well as participation, which can result in enhanced engagement and deeper learning. This is adopted by the author within LTRA as the sustainability audit, participation in in-class activities and reflection on module experiences.

Education for Business Sustainability: the module environment

To promote the sustainability knowledge, skills and values and employment skills that will prepare students for their future workplaces and encourage sustainability advocacy the author has introduced an innovative Level 6 business sustainability module operated as a 'Living Lab'. The module is designed to provide effective, hands-on LTRA for Business Management students by aligning learning, teaching, and research to the module assessment, an audit of a simulated real-world case study company. The author considers

this LTRA approach can provide a challenging but engaging and relevant learning environment that enables students in participate in active, collaborative learning in a simulated real world setting.

The module is designed around the concepts for effective learning retention presented in the Cone of Learning (Dale, 1969). Learning retention is vital for Business Management students to enable them to carry forward their sustainability knowledge, skills and values, and employment skills into their future workplaces to develop sustainable business futures and sustainability advocacy. Therefore, as advocated by Dale (1969), the majority of LTRA is aligned to the two lower tiers of the cone (Figure 1) to enable up to 90% of learning to be retained. Figure 1 presents some of the inputs and activities used to engage students in effective learning through 'participating' and 'doing' to enhance hands-on and experiential learning that actively immerse students in the learning process.

Figure 1

The module, delivered in weekly 3-hour teaching slots over one semester, is designed as a series of progressive sessions that build knowledge and skills of generative sustainability theory and practice week-on-week. Each taught session has a small transmissive content of lecture slides and videos (c. 15% of lecture time), which can promote up to 30% knowledge retention through verbal receiving. However, the majority of each session comprises practical audit inputs that promote case study analysis and independent research into sustainable solutions. These are designed to provide the experiential learning in the hands-on manner, with ongoing face-to-face support and formative feedback, that students have come to expect (Ramsden 2013) and develop employment skills of collaboration, negotiation, communication and influencing that Cashian, Clarke and Richardson (2015) recognise as lacking in many graduates. These participative activities may increase the memory of learning up to 90% of the information received Dale (1969).

A post activity debriefing supports each activity as it can embed sustainability theory, good practice and wider values (Emblen-Perry, 2018). These promote peer-to-peer learning and encourage the development of transferable employment skills and students' independence (Savery and Duffy, 1995). Debriefing can also help embed sustainability knowledge and skills and can promote the individual and collective feelings of responsibility that Ellison and Wu (2008) suggest motivate learning for good practice and develop personal sustainability values. These are valuable inputs for the module assignment, as it requires students to evaluate their audit findings and propose a sustainable management strategy that addresses key issues identified. As there are no right or wrong answers for this assignment, the author hopes that promoting personal sustainability values will result in greater participation in the in-class activities, in-depth evaluation of the case study and design of more creative sustainable responses, which in turn may generate emotional engagement.

The author operates the module as a 'Living Lab' to involve students in pedagogical research throughout the 12 teaching weeks. This involves collecting students' reflections on the learning process, knowledge and skills development and experiences of participating in in-class activities. In addition to enabling pedagogic research, this offers an opportunity to understand the best way to meet students' needs and how best to enhance students' learning (Moron-Garcia and Willis, 2009). Providing students with these opportunities to engage in the critique of their role in the module and reflect on their individual and collective learning enhances self-awareness (Lacan, 1977) and may promote self-belief through recognition of their learning. Such reflection facilitates embedding sustainability concepts

and theories and encourages continuous improvement (Helyer, 2015) which underpins successful business sustainability.

The author also considers the LTRA approach beneficial as it provides a weekly forum to facilitate and reinforce the value of collecting audit evidence on an ongoing basis rather than implementing just-in-time learning. This scaffolding is designed to develop students' skills and knowledge in the audit process, critical analysis and strategy development as, advocated by Fazey and Fazey (2001), self-perceived competence can significantly motivate engagement and promote attendance.

The sustainability audit

The sustainability audit is defined by the author as 'a methodical examination of organisational procedures and practices that determine or influence environmental, social or economic impacts'. As both the means and method of LTRA, it provides ongoing opportunities to create knowledge and stimulate integrated thinking through the creation, collation and synthesis of information (Moalosi, Molokwane and Mothibedi, 2012). This approach to learning can therefore stimulate and enhance softer employment skills such a collaboration, negotiation and influencing along with career and life skills such as accountability and self-direction.

The sustainability audit, using a modified GRI template and audit process, as the focus of the module's LTRA provides a clear focus on exploring and solving real life problems, which can drive the learning process (Stauffacher et al. 2006) and encourage students to actively participate (Elam and Spotts, 2004). The real world problems are situated in a simulated real world company which engages students in ethical dilemmas, incomplete information and uncertainty to promote the knowledge skills and values of 'know-how' and 'know-why' advocated by Bereiter (2013). It also ensures students are equipped to face and address sustainability challenges in their future working life by incorporating real world complexity into learning as advocated by Laurie et al. (2016). The author considers the sustainability audit may help equip future managers and leaders with sustainability knowledge skills and values and essential life skills of decision-making and behavioural choices within increasingly complex business environments to become sustainability advocates and so help change businesses from within.

The case study and case study based activities

The students audit an online, mixed-media case study of a simulated real world company that is hosted on a WordPress website and accessed through the module's VLE. This case study, which simplifies access to a real world business within the complex HE environment, utilises emails, letters, business reports, photographs, etc., rather than merely text, to present the (un)sustainable company to the students.

It was written by the author to provide a new style of learning platform that provides real world learning as advocated by Elam and Spotts (2004) in an immersive, experiential learning environment to promote learning through dialogue as advocated by Culpin and Scott (2011). McCarthy and McCarthy (2006) and Burns et al. (2012) suggest this can engage students in personal interaction with the environment being studied, which Mintzberg, (2005) suggests is the key method for developing the essential skills of management required for future career success. This immersive case study and the use of in-class case study based activities, which offers no right or wrong answers, can also facilitate cognitive learning (Bonney, 2015), and promote thinking and decision making skills in the disordered context advocated by Hardin et al. (2016), which are vital for sustainable business futures.

The in-class activities, designed to embed knowledge of the case study and link real world business practices to the case study company to facilitate collection of audit data and provision of feedback and support, are both creative and participative to differentiate this from other Business Management modules; drawing, film making, crosswords, quizzes and impact assessments. Different styles of support and guidance are also offered through innovative 'Meet the Manager Sessions'. In these students can discuss their perceptions of the case study and strategic solutions with managers from the case study company (role played by external colleagues). In addition, a sustainability consultant leads a business analysis session to provide real world tools and techniques for evaluation of audit findings within the assignment. Exploring and applying the case study in this way also provides an opportunity to position the skills of case study analysis within the graduate recruitment process, in which case study analysis is frequently used for assessment centres.

In-class activities are supplemented with post-activity debriefings and 'Living Lab' research activities to embed sustainability knowledge and skills and develop softer employment skills. Encouraging reflection on the task and its outcome(s) can promote peer-to-peer learning and encourage development of students' independence (Savery and Duffy, 1995), responsibility for learning (Fryer and Schulman, 1995), personal values and academic skills of enquiry, problem solving and critical analysis.

Design of the study

This research study, conducted with 73 Level 6 students over the two academic years 2016-17 (39 students) and 2017-18 (34 students), was designed to establish the effectiveness of using a sustainability audit as a means and method for providing hands-on EfBS for Business Management students. Within this study 'effectiveness' is established through students' reflections on the following four research foci:

- Development of sustainability knowledge and skill;

- Development of employment skills;

- Development of life and career skills

- Engagement with the LTRA approach

Two mixed methods pre- and post-module surveys established the development of skills within the first three measures of effectiveness; engagement was evaluated through students' feedback contained in the university's standard end of module evaluation process.

Sustainability skills questions included in the two surveys reflected skills expected of sustainability practitioners established by Weik et al. (2011) whilst employment skills questions reflected expectations of employment ready graduates established by Lowden et al. (2011). These were categorised in the survey, and reported in the research findings, as sustainability knowledge, employment skills (including information and media literacy) and life and career skill.

In addition to the basic softer skills expected of employment ready graduates, such as collaboration, negotiation influencing, etc., academic skills of information and media literacy were explored, as they are becoming critical for successful business careers. This study considers information literacy as 'knowing what information is needed and why it is needed; where to find it and how to use to communicate it appropriately' and media literacy as 'the ability to access, critically analyse, evaluate and create information from the complex messages received from radio, internet, newspapers, magazines, books and computer games'.

The first of the two surveys established students' pre-module level of sustainability knowledge and skill and perceptions of undertaking the sustainability audit. This provided a benchmark for the research and enabled additional support and guidance to be incorporated if appropriate. The second survey established students' development of skills through the hands-on LTRA approach applied. It also captured personal reflections on participation in the LTRA approach and learning from undertaking the sustainability audit. This provided input for this study and enabled potential improvements to be identified and fed forward into future occurrences of this and other modules.

The surveys sought both quantitative and qualitative responses. Quantitative questions encouraged students to evaluate their sustainability knowledge against a four-point rating scale, which avoided participants selecting the central position (Moors, 2008): No Knowledge, A Little Knowledge, Some Knowledge or Very Good Knowledge. These research findings, which demonstrate potential student outcomes from participating in a sustainability audit, are presented against the four measures of LTRA effectiveness.

Qualitative questions explored the study's four measures of effectiveness further. These collected students' perceptions of their knowledge in various dimensions of sustainability, employment skills and life and career skills to establish the effectiveness of using a sustainability audit to deliver LTRA. Career skills included problem solving, critical thinking and collaboration whilst life skills included self-direction, accountability, flexibility and initiative. In addition, the second survey explored students' experiences of conducting their sustainability audit and participating in in-class activities linked to the case study.

The university's standard end of module evaluation process was also used to collect data for this study. Qualitative feedback from these evaluations was mapped onto the Framework for Engagement (Emblen-Perry, 2018) to evaluate a sustainability audit's effectiveness in engendering students' engagement.

Research findings

This study indicates students believe their knowledge and skills have increased over the course of the module in all four measures of LTRA effectiveness; development of sustainability knowledge and skill, employment skills; career and life skills and engagement with the LTRA approach.

Effectiveness measure 1: Sustainability knowledge

The research findings suggest that utilising a sustainability audit as the focus for LTRA can develop sustainability knowledge (Figure 2). Students reported an increase in their sustainability knowledge with a majority of students ending the module with 'good knowledge' in all but one area of sustainability. To overcome the lower growth of economic sustainability knowledge additional focus will be placed on this area in the future. No students ended the module with 'a little' or 'no knowledge' of the different aspects of sustainability.

Figure 2

Effective measure 2: Employment skills

The research findings suggest that utilising hand-on LTRA can promote the development of employment skills (Figure 3). Students' skill levels have increased in all employment skills dimensions explored in this study, particularly collaboration, negotiation and influencing. This may be due to participation in-class activities, which are designed to promote these

employment skills through group-working. The small increase in students reporting 'a little skill' in critical thinking is of concern, although it may simply be due to an increase in self-awareness and recognition of more limited skill levels than previously believed. This will be explored further in future research.

Figure 3:

Students' survey responses also suggest a sustainability audit and associated in-class activities can promote information and media literacy (Figure 4); skills that promote personal responsibility for learning and filtering of information to focus on what is needed and what can be set aside. The growth in media literacy may reflect the independent research required to support the reflections on audit findings and sustainability strategy proposal, which are required for the assignment.

Figure 4:

Effectiveness measure 3: Life and career skills

Development of life and career skills appears to be of particular strength in this innovative LTRA approach. Whilst over a quarter of students perceived they had good career and life skills in the first survey, in the second survey this increased to over 50% in all areas evaluated. Conducting a sustainability audit appears promote self-direction and accountability, whilst the group work, and possibly the Meet the Manager Sessions, appear to support development of social skills. Students reported lower productivity at the end of the module, which, although disappointing, may be due to the inability to complete the audit with just-in-time learning and/or increased self-awareness of more limited skill levels than previously believed.

Figure 5:

Effectiveness measure 4: Engagement

Mapping students' qualitative feedback from 2016-17 and 2017-18 module evaluations onto the Framework for Engagement (Emblen-Perry, 2018) (Figure 6) suggests using a sustainability audit as the focus of the module can provide effective hands-on LTRA for Business Management students. Students reported the LTRA approach was challenging, relevant and fun, which strongly engaged them in the three dimensions of engagement used in the framework.

Figure 6:

Practical implications and impacts

The research findings presented above demonstrate the value of using a sustainability audit to develop students' sustainability knowledge, employment skills and career and life skills in an engaging and relevant learning environment. In addition, the findings suggest this approach can offer other values for students, employers and educators that were not designed into the learning outcomes of the module; personal sustainability values, learning

awareness and lecture attendance. These suggest the LTRA approach explored in this study may offer educators a novel learning platform with which to engage students in EfBS.

As well as fostering sustainability knowledge, the employment skills expected by graduate employers (Pegg et al, 2012) and life skills, the study suggests engaging students in a sustainability audit and associated activities can stimulate personal sustainability values, which may in turn promote advocacy for sustainable futures and desire to change business from within. For example, students reported the module:

"[Developed] greater awareness of sustainability and personal actions"

"[Encouraged us to think] how you can adapt to be more sustainable"

"[Developed recognition of] the importance of taking accountability due to learning from case study"

Immersion in the audit and simulated real world case study through in-class activities provides the real world learning advocated by Elam and Spotts (2004) and immersive and experiential learning environment advocated by McCarthy and McCarthy (2006) to encourage deeper learning. Student reflections, collected over the two years of the study, suggest using this approach to LTRA can promote recognition of learning's 'know-why' as well as 'know-how' Bereiter (2013), which may enhance future academic as well as career success. Students reported participation in the LTRA:

"Encouraged me to think and analyse critically"

"Encouraged us to read between the lines for evidence to use in arguments"

"Furthered self-discipline to complete tasks/assignments"

"Helped to give a holistic view of the problems"

In addition to deeper learning, research findings suggest students matured in learning awareness by participating in the module. For example, students recognised:

"Analysing and synthesising information from a case study is a skill in itself"

"Auditing is a very useful business skill"

"Helped me get more involved with the case study and question more"

This may relate to the development of accountability and self-direction reported by the students (Figure 5), which helps individuals recognise the value of learning and engage positively with it (Fryer and Schulman, 1995). The author also recognises from changes in in-class behaviour and engagement with activities that many students increased self-awareness and self-belief during the module.

Students' reflections collected during this study suggest the immersive, experiential learning environment provided through the sustainability audit and case study activities can personally engage them in the environment being studied as identified by Burns et al. (2012) and, can in turn, develop the essential skills of management required for future career success recognised by Mintzberg (2005). For example, students reported the LTRA approach helped them to:

"Approach business analysis with a structured approach

"Understand a lot more about the use of sustainable practices in businesses… and the impact of sustainability on everyday life"

"Understand how you can give companies recommendations to improve their sustainability performance bit by bit"

This LTRA approach also appears to provide the foundation for students to achieve a successful assignment outcome in the student-centred, hands-on learner interactions they prefer (Conole and Alevizou, 2010). In 2017-18 students' results were, on average, one grade higher than the university benchmark for equivalent modules. It therefore suggests the incorporation of real world complexity and learning, as advocated by Elam and Spotts (2004), through a simulated real world case study and audit processes, can equip students to face and address future workplace sustainability challenges (Laurie et al., 2016) and guide students to successful personal module outcomes.

The Framework for Engagement (Figure 6) suggests a sustainability audit can provide an active, but cognitively demanding, learning environment in which hands-on LTRA encourages students to shape their own learning experience and strongly engage with the module and the learning. It highlights the value students place on active learning, a mix of learning styles and an interactive learning environment in which a passion for the subject is clearly shown. This has led to levels of strong student engagement that may contribute to pedagogic debate on potential means and methods for overcoming the challenge of poor lecture attendance and engagement recognised by Leach (2016). Students reported:

"I loved learning about sustainability so wanted to know more each week"

"[It ensured] I turned up to the majority of lectures as I knew how important they were in order to understand the different audit sections"

"[It ensured] my attendance was high as I enjoyed it"

"I attended as many lectures as possible as I thought it was important

The framework suggests if this challenging, collaborative and active learning environment is offered students will engage with the EfBS and the LTRA processes provided. In addition, it emphasises this LTRA approach can engender learners' emotional commitment as well as participation and investment in their own learning. The author considers this high level of emotional commitment valuable as it appears to lead to high levels of lecture attendance during the course of this study; over 75% attendance in 2016-17 and over 80% in 2017-18.

However, as this study reports the findings of a small-scale, self-reported two-year study it may have some limitations. Firstly, the small size of the study (73 students) restricts firm conclusions from being drawn. Secondly, as the research relies on students' self-reported perception of knowledge and skills, the responses may feature a level of bias. Thirdly, the anonymity of participants prevents development of individuals' knowledge, skills and values being established; results are therefore collated to present overall findings. Finally, although the outcomes of the LTRA approach presented are attributed to participation in a module designed around a sustainability audit, the author recognises that other life experiences, work practices and academic study may have contributed to students' enrichment of life and career skills and/or information and media literacy. Further studies will address these limitations to validate the findings of this research.

Despite these limitations, the author considers the innovative leaning platform for EfBS presented in this paper may be of interest to educators as it delivers a range of benefits to students, employers and educators. The findings suggest a sustainability audit offers an effective hands-on approach to EfBS that can deliver the process and outcome of learning through auditing identified by Corcoran and Wals (2004. Conducting a sustainability audit of a simulated real-world case study company can immerse students in real-world learning

recommended by Rieckmann (2011), Docherty (2014), Molthan-Hill (2014) and Wiek et al., (2014) and create learning experiences that equip participants with sustainability and employment skills that meet employers' expectations and deliver the needs of the changing job market (Foster and Yaoyuneyong, 2016). The learning environment created can enable students to connect and communicate constantly (Taylor and Parsons, 2011) with peers, sustainability practitioners and tutors to develop and critically assess knowledge through peer-to-peer learning and interaction with experts (Dunleavy & Milton, 2009) which can deliver career and life skills and overcome low levels of student engagement and attendance.

Conclusions

The LTRA approach implemented within the Level 6 business sustainability module appears to provide a challenging, active and experiential real world learning environment that can develop students' knowledge, skills and values within all of the four measures of LTRA effectiveness used within this study. In addition, using a sustainability audit as the focus of LTRA appears to enable students to shape their own learning experience, which can stimulate students' engagement with business sustainability, self-awareness, their own learning processes and the learning environment as a whole.

Students' reflections on participating in the module demonstrate the value of undertaking an audit and learning through audit and case study linked in-class activities for developing engagement and sustainability knowledge, skills and values, as well as the employment skills expected of employment ready graduates. The study therefore concludes audit-based EfBS can provide effective, hands-on business sustainability LTRA for Business Management undergraduates.

References

Adomssent, M., Fischer, D., Godemann, J., Herzig, C., Otte, I., Rieckmann, M. and Timm, J. (2014), "Emerging areas in research on higher education for sustainable development - Management education, sustainable consumption and perspectives from central and Eastern Europe", *Journal of Cleaner Production*, Vol. 62, pp. 1–7.

Beech, N. and MacIntosh, R. (2012), *Managing Change: Enquiry and Action,* Cambridge University Press, Cambridge.

Bereiter, C. (2013), "Principled practical knowledge: not a bridge but a ladder". *Journal of the Learning Sciences*, Vol. 23, No. 1, pp. 4–17.

Bonney, J. (2015), "Case Study Teaching Method Improves Student Performance and Perceptions of Learning Gains", *Journal of Microbiology and Biology Education*, Vol. 16 No. 1, pp. 21-28.

Bonwell, C, Eison, J. (1991), *Active learning: Creating excitement in the classroom*, Jossey-Bass. Washington, D.C.

Bunce, L., Baird, A. and Jones, S. (2017), "The student-as-consumer approach in higher education and its effects on academic performance", *Studies in Higher Education*, Vol. 42 No.11, pp. 1958-1978.

Burns, D., Leung, C., Sing, G. and Yeung, B. (2012), "Limitations of the Case Study Approach to Pedagogical Ethics Education: Transformative dialogue" *Teaching and Learning Journal*, Vol. 6 No. 1, pp. 1-10.

Cashian, P., Clarke, J. and Richardson, M. (2015), "Perspectives on: Employability. Is it time to move the employability debate on? Chartered Association of Business Schools", available at: https://charteredabs.org/wp-content/uploads/2015/06/Employability-Debate1.pdf(accessed 28 September 2018)

Chapman T, Dunkerley E (2012) "Building Young People's Resilience in Hard Times: an evaluation of Telefónica O2 Think Big Programme in the UK", available at: https://www.dur.ac.uk/ (accessed 12 September 2018).

Christenson, S, Reschly, A, Wylie, C. (2012), *Handbook of research on student engagement*, Springer, Dordrecht.

Corcoran, P. and Wals, A. (2004), *Higher Education and the Challenge of Sustainability: Problematics, Promise, and Practice*. Kluwer Academic Publishers, Boston.

Culpin, V. and Scott, H. (2011), "The effectiveness of a live case study approach: Increasing knowledge and understanding of 'hard' versus 'soft' skills in executive education". *Management Learning*, Vol. 43 No. 5, pp. 565–577.

Connor, H., Hirsch, W. and Barber, L. (2003), *Your Graduates and You: effective strategies for graduate recruitment and development*, Institute of Employment Studies, Brighton.

Conole, G. and Alevizou, P. (2010), *A literature review of the use of Web 2.0 tools in higher education*, Higher Education Academy, York.

Crosthwaite, C., Cameron, I., Lant, P. and Litster, J. (2006), "Balancing curriculum processes and content in a project centred curriculum: In pursuit of graduate attributes", *Education for Chemical Engineers*, Vol. 1 No. 1, pp. 39-48.

Dale, E. (1969), *Audio-visual methods in teaching*, Dryden Press, New York

Disterheft, A., Caeiro, S., Azeiteiro, U. and Leal, W. (2015), "Sustainable universities - a study of critical success factors for participatory approaches". *Journal of Cleaner Production, Vol.* 106, pp. 11-21.

Dochety, D. (2014), "Universities must produce graduates who are ready for any workplace",

available at: https://www.theguardian.com/higher-education-network/2014/may/22/universities-must-produce-graduates-who-are-ready-for-workplace (accessed 30 June 2018).

Drayson, R. (2015), "Employer attitudes towards, and skills for, sustainable development. Higher Education Academy", available at: https://www.heacademy.ac.uk/system/files/executive-summary-employers.pdf (accessed 24 June 2018).

Dunleavy, J. and Milton, P. (2009), "What did you do in school today? Exploring the concept of Student Engagement and its implications for Teaching and Learning in Canada", *Canadian Education Association*, pp. 1-22.

Edie (2015), "Minding the gap: Developing the skills for a sustainable economy, available at: https://www.edie.net (Last accessed 12/04/2018).

Elam, E. and Spotts, H. (2004). "Achieving marketing curriculum integration: A live case study approach", *Journal of Marketing Education*, Vol. 26 No. 1, pp. 50-65.

Ellison, N. and Wu, Y. (2008). "Blogging in the Classroom: A Preliminary Exploration of Student Attitudes and Impact on Comprehension". *Journal of Educational Multimedia and Hypermedia*, Vol. 17 No. 1, pp. 99-122.

Emblen-Perry, K. (2018), "Enhancing student engagement in business sustainability through games", *International Journal of Sustainability in Higher Educa*tion, Vol. 19 No. 5, pp. 858-876.

Emblen-Perry, K. and Duckers, L. (2018), "Educating Students and Their Future Employers to Minimise Environmental and Climate Impacts through Cost-Effective Environmental Management Strategies", in Leal Filho, W. and Leal-Arcas, R. (eds), *University Initiatives in Climate Change Mitigation and Adaptation*. Springer, Cham, Switzerland, pp. 13-32.

Fazey, D. and Fazey, J. (2001), "The potential for autonomy in learning: Perceptions of competence, motivation and locus of control in first-year undergraduate students", *Studies in Higher Education*, Vol. 26 No. 3, pp. 245-61.

Figuero, P. and Raufflet, E. (2015), "Sustainability in Higher Education: A systematic review with focus on management education", *Journal of Cleaner Production*, Vol. 106, pp. 22-33.

Foster, J. and Yaoyuneyong, G. (2016), "Teaching innovation: equipping students to overcome real-world challenges", *Higher Education Pedagogies*, Vol. 1 No. 1, pp. 42-56,

Fredman, P. (2012), "Universities as role models for sustainable development" paper presented at the EUA Annual Conference; The Sustainability of European Universities, 22-23 March, Warwick, available at: http://www.eua.be/Libraries/eua-annual-conf-2012-warwick/ (accessed 15 August 2018)

Frymier, A. and Schulman, G. (1995), "What's in it for me? Increasing content relevance to enhance students' motivation", *Communication Education*, Vol. 44, pp. 40-50.

Hardin, R., Bhargava, A., Bothner, C., Browne, K., Kusano, S., Golkrokhion, A., Wright, M., Zhu Zeng, P. and Agrawal A. (2016), "Towards a revolution in sustainability education: Vision, architecture and assessment in a case-based approach". *World Development Perspectives*, Vol. 1, pp. 58-63.

Helyer, R. (2015) "Learning through reflection: the critical role of reflection in work-based learning (WBL)", *Journal of Work-Applied Management*, Vol. 7 No. 1, pp.15-27.

Higher Education Academy. (2015), "Education for sustainable development (ESD)", available at; https://www.heacademy.ac.uk/workstreams-research/themes/education-sustainable-development (accessed 05 June 2018).

Higher Education Funding Council for England. (2014), Sustainable Development in higher education: HEFCE's role to date and a framework for its future actions, available at: http://webarchive.nationalarchives.gov.uk/20180322111500/http://www.hefce.ac.uk/pubs/year/2014/201430/ (accessed 23 September 2018).

Holtum, C. (2014), "Expert views: sustainability and business education", available at https://www.theguardian.com/sustainable-busienss/sustainable-business-education-expert-views (accessed 01 July 2018).

IEMA. (2014), "Preparing for the Perfect Storm", available at: https://www.iema.net/ (accessed 30 September 2018).

Lacan, J. (1977), The Mirror-Stage as Formative of the I as Revealed in Psychoanalytic Experience, (Trans. by Alan Sheridan in Écrits: A Selection), W.W. Norton and Co., New York.

Lambrechts, W. and Ceulemans, K. (2013), "Sustainability Assessment in Higher Education. Evaluating the Use of the Auditing Instrument for Sustainability in Higher Education (AISHE) in Belgium", in Caeiro, S., Leal Filho, W., Jabbour, C. & Azeiteiro, U. (eds), *Sustainability Assessment Tools in Higher Education Institutions, Mapping Trends and Good Practice Around the World*, Springer, Cham, Switzerland, pp. 157-174.

Laurie, R., Nonoyama-Tarumi. Y., Mckeown, R. and Hopkins, C. (2016), "Contributions of Education for Sustainable Development (ESD) to Quality Education: A Synthesis of Research", *Journal of Education for Sustainable Develo*pment, Vol. 10 No. 2, pp. 226-242.

Laurinkari, J. & Tarvainen, M. (2017), *The Policies of Inclusion*. EHV Academic Press, London.

Leach, L (2016), "Exploring discipline differences in student engagement in one institution. *Higher Education Research and Development*", Vol. 35 no. 4, pp. 772-786.

Lowden, K., Hall, S., Elliot, D. and Lewin, J. (2011), "Employers' Perceptions of the Employability Skills of New Graduates". Glasgow: University of Glasgow SCRE Centre and Edge Foundation Mountbatten Institute, available at: https://www.educationandemployers.org/wp-content/uploads/2014/06/employability_skills_as_pdf_-_final_online_version.pdf (accessed 22 june 2018).

Lynch, K. (2006), "Neo-liberalism and Marketisation: the implications for higher education". *European Educational Research Journal*, Vol. 5, pp. 1-17.

McCarthy, P. and McCarthy, H. (2006), "When case studies are not enough: Integrating experiential learning into the business curricula", *Journal of Education for Business*, Vol. 81 No. 4, pp. 210–204.

Mintzberg, H. (2005), *Managers not MBAs: a hard look at the soft practice of managing and management development,* Berrett-Koehler, San Francisco.

Moalosi, R., Molokwane, S. and Mothibedi, G. (2012), Using a Design-orientated Project to Attain Graduate Attributes. *Design and Technology Education*, Vol. 17 No. 1, pp. 30-43.

Molthan-Hill, P. (2014), *The business student's guide to sustainable management: principles and practice*, Greenleaf Publishing, Sheffield.

Moors, G. (2008), "Exploring the effect of a middle response category on response style in attitude measurement". *Quality and Quantity*, Vol. 42 No. 6, pp. 779-794.

Moron-Garcia, S and Willi, L. (2009), Introduction to the Pedagogic Research Tool Kit, available at: https://www.heacademy.ac.uk/system/files/pedagogic-research-tool-kit.pdf [accessed 03 October 2018]

Partnership for 21st Century Skills. (2007), "Framework for 21st Century Learning", available at: http://www.p21.org/storage/documents/docs/P21_framework_0816.pdf (accessed 14 May 2018).

Pegg, A., Waldock, J., Hendy-Isaac, S. and Lawton, R. (2012), "Pedagogy for employability", available at: https://www.heacademy.ac.uk/system/files/pedagogy_for_employability_update_2012.pdf (accessed 24 May 2018).

Perello-Marín, M., Ribes-Giner, G. and Pantoja Díaz, O. (2018), "Enhancing Education for Sustainable Development in Environmental University Programmes: A Co-Creation Approach". *Sustainability*, Vol. 10, pp. 158

Prince, M. (2013), "Does Active Learning Work? A Review of the Research", *Journal of Engineering Education*, Vol. 93 No. 3, pp. 223-231.

Quality Assurance Agency for Higher Education. (2014), "Education for sustainable development: Guidance for UK higher education providers", available at: http://www.qaa.ac.uk/en/Publications/Documents/Education-sustainable-development-Guidance-June-14.pdf (accessed 12 May 2018).

Ramsden, P. (2013), "The Future of Higher Education Teaching and the Student Experience", available at: https://www.heacademy.ac.uk/knowledge-hub/future-higher-education-teaching-and-student-experience (accessed 14 May 2018).

Rieckmann, M. (2011), "Future-oriented higher education: Which key competencies should be fostered through university teaching and learning?" *Futures*, Vol. 4, pp. 127–135.

Savery, J. & Duffy, T. (1995). "Problem based learning: An instructional model and its constructivist framework". *Educational Technology*, Vol. 35 no. 5, pp. 31–38.

Shephard, K. (2007). "Higher education for sustainability: seeking affective learning outcomes", *International Journal for Sustainability in Higher Education*, Vol. 9, No. 1, pp. 87-98.

Stauffacher, M., Walter, A., Lang, D., Wiek, A. and Scholz, R. (2006), "Learning to research environmental problems from a functional socio-cultural constructivism perspective: the transdisciplinary case study approach", *International Journal of Sustainability in Higher Education, Vol* 7 No. 3 pp. 252-275.

Stoner, S. and Fincham, J. (2012), "Faculty Role in Classroom Engagement and Attendance", *American Journal of Pharmaceutical Education*, Vol. 76 No. 5, article 75.

Stough, T., Ceulemans, K. Lambrechts, W. and Cappuyns, V. (2018), "Assessing sustainability in higher education curricula: A critical reflection on validity issues", *Journal of Cleaner Production*, Vol. 172, pp. 4456-4466.

Stubbs, W. (2011), "Addressing the business-sustainability nexus in postgraduate education", *International Journal of Sustainability in Higher Education*, Vol. 14 No. 1, pp. 25-41.

Taylor, L. & Parsons, J. (2011), "Improving Student Engagement*, Current Issues in Education*, Vol. 14 No. 1 pp. 1-33.

 The Guardian. (2016), "Now a degree is a commodity, no wonder more students are cheating", available at: https://www.theguardian.com/education/commentisfree/2017/feb/22/degree-commodity-university-funding-students-plagiarism (accessed 04 October 2018)

UNESCO. (2002),"Education for Sustainability, From Rio to Johannesburg: Lessons learnt from a decade of commitment", available at: .http://unesdoc.unesco.org/images/0012/001271/127100e.pdf (accessed 12 June 2018)

UNESCO. (2011). "Definition of Education for Sustainable Development", available at: https://en.unesco.org/themes/education-sustainable-development (accessed 08 June 2018).

UNESCO. (2017), "Education for Sustainable Development Goals Learning Objectives", available at: http://unesdoc.unesco.org/images/0024/002474/247444e.pdf (accessed 18 June 2018).

United Nations. (2017), "Sustainable Development Knowledge Platform: Sustainable Development Goals", available at: https://sustainabledevelopment.un.org/sdgs (accessed 08 June 2018).

Vanderstraeten, R. (2004), "Education and Society: a plea for a historical approach". *Journal of Philosophy of Education*, Vol. 38 No. 2, pp. 195-206.

Wiek, A., Xiong, A., Brundiers, K. and van de Leeuw, S. (2014)., "Integrating problem-and project-based learning into sustainability programs", *International Journal of Sustainability in Higher Education*, Vol. 15 No. 4, pp. 431-449.

Woodall, T., A. Hiller, and S. Resnick. (2014). "Making Sense of Higher Education." *Studies in Higher Education*, Vol. 39 No. 1, pp. 48–67.