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Are the sustainability-oriented skills and competencies of business graduates meeting or missing employers' needs? Perspectives of regional employers

ABSTRACT

In the Anthropocene, universities play a role in developing students' sustainability literacy and capacity to solve socio-ecological challenges. The objective of this study is to identify the generic and sustainability-oriented skills and competencies required of business graduates by regional employers. The regional focus meets a gap in the literature. An online survey of employers in North Queensland found that they attach importance to a wide range of skills and competencies and see sustainability as a key factor in future business success. Yet, there are contradictions in terms of their support for sustainability in the curriculum and business practices, particularly when it comes to the recruitment and selection process. Furthermore, contradictions exist between the university's adoption of the Sustainable Development Goals (SDGs), and the weak interest displayed by prospective employers in graduates' sustainability literacy. This study has important implications for regional universities. A reframing of the role of sustainability education in the curriculum is warranted, where a deeper connection is made between sustainability education and the values employers already hold. Recommendations for curriculum designers are made on how to foster and assess the competencies that business graduates need to meet the demands of regional business upon entering the labour market.

KEYWORDS: sustainability education, skills and competencies, regional employers.

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Introduction

Universities increasingly recognize the importance of embedding the 17 United Nations' Sustainable Development Goals (SDGs) into their strategic plans and their teaching and research practices (Farinha, Caeiro, & Azeiteiro, 2019). The SDGs (UN Global Compact, 2016), ratified in 2015, are set to guide global development through to 2030 (UNDP, 2015) and cover a wide range of issues including global poverty, health, sustainable production and consumption and climate change. Universities are claimed to play a key role in addressing sustainability-related problems (Aleixo, Leal, & Azeiteiro, 2016; Gale, Davison, Wood, Williams, & Towle, 2015). They play a critical role in developing human capital and producing graduates who not only are 'work ready', but who can become change agents within their organisations (Heiskanen, Thidell, & Rodhe, 2016; Hesselbarth & Schaltegger, 2014).

The term 'Anthropocene' denotes the new geological era in which many conditions and processes on Earth are profoundly altered by the impact of humans (Crutzen & Storer, 2000). According to Crutzen (2006, p.13), "*Because human activities have also grown to become significant geological forces, for instance through land use changes, deforestation and fossil fuel burning, it is justified to assign the term "anthropocene" to the current geological epoch*". It is argued that the Anthropocene "*marks an awakening and a significant moment for environmental education*" (Cole & Malone, 2020, p. 157). Given the significant challenges facing humanity, familiar approaches to sustainability education may be inadequate. A critical challenge for universities is the 'framing' of sustainability within traditional degree programs so that students can see its relevance for professional practice and are empowered to respond to the global ecological challenges of our time (Sandri, 2020). It has been argued that cross-disciplinary, participative approaches (Edwards et al., 2020), as well as novel, experiential approaches to sustainability teaching are needed, where learning

takes place outside of, or in addition to, traditional lecture-centered forms of education (Backman, Pitt, Marsden, Medmood, & Mathijs, 2019). With scientists across the world warning of an impending climate emergency (Ripple, Wolf, Newsome, Barnard, & Moomaw, 2020), there is a need to explore whether graduates possess the skills and competencies needed to solve a ‘super wicked’ problem, a new class of global, environmental problems that are disregarded by policy makers (Levin et al., 2012).

While changes in student identity, world-view and epistemology are known to occur across the undergraduate degree study period (Hay & Eagle, 2019), universities face many challenges. These include a denial of personal responsibility by staff and students for sustainability challenges (Pompeii et al. 2019); the task of engaging external actors which requires flexibility and may generate unease among students (Backman et al., 2019), and the need for personal commitment amongst academics to act as champions of sustainability (Kemper, Ballantine, & Hall, 2019). In addition, as most universities see public financial support diminishing, they feel the need to become more efficient and business-like to survive, and this scenario is not always conducive to a reorientation of teaching and research. Sustainability is often “*just another course or research project, which is just as expendable if it does not pay its way*” (UNESCO, 2012, p. 49). Increased pressure has been noted for at least the last decade for educational institutions to keep up with international competitors, particularly via achievement in core subject such as maths, science and literacy (Kennelly, Taylor, & Serow, 2011). Furthermore, the uncritical and enthusiastic promotion of Science, Mathematics, Engineering and Technology (STEM) subjects has been linked to neoliberalism, with its emphasis on free market activity and deregulation. Consequently, it is argued that the pursuit of economic growth does little to address environmental decline (Smith & Watson, 2019). Scholars (Aikens, McKenzie, & Vaughter, 2016) highlight ‘competing paradigms’ in a recent review of the field of environmental and sustainability

education (ESD), or in other words, variations and tensions in the terminology and understandings of environmental and sustainability education. Scholars suggest that by virtue of its openness to interpretation, ESD fails to challenge ‘business as usual’ perspectives and supports economic primacy, allowing a neoliberal agenda to further dominant educational policy (González-Gaudiano 2006; McKenzie 2012). Policy makers are embracing ‘industry 4.0’, or the ‘fourth industrial revolution’ concept (Ghobakhloo, 2020), and graduates are expected to acquire digital skills which support advanced technologies such as cloud computing, artificial intelligence, robotics, as well as emerging technologies such as the ‘Internet of Things’ (Nord, Koohang, & Paliszkiwicz, 2019). These significant changes will also require critical examination of the relevance of the disparate range of theories and frameworks that have been applied to sustainability educational design and delivery (see, for example, Eagle et al., 2015). Many of these theories are descriptive rather than predictive and have not been subject to empirical testing in the modern educational context, thus offering limited support for educators. Further, the link between industry 4.0 and sustainability has been found to be weak, particularly in relation to social sustainability (Furstenau et al., 2020). Therefore, competing paradigms and a shift to the instrumentalist role of education could perhaps dilute the priority given to cultivating a sense of ethics and care for people, as well as for the natural environment. These debates are highly relevant to regional, resource-based economies. The priority given to assimilating sustainability competences into the curriculum by regional universities may, or may not be, shared by regional employers, making it important to explore regional employers’ perspectives and adopt a place-based approach.

This paper examines the role of a regional Australian university in delivering sustainability education and meeting the needs of regional employers. The role for regional universities in sustainability and sustainable development has been acknowledged as

underrated (Karatzoglou, 2013; Sedlacek, 2013). While it is claimed that an overwhelming majority of the world's CEOs regard sustainability and sustainable development as essential for long-term business success (Lans, Blok, & Wesselink, 2014), the match between sustainability-related skills and competencies of recent business graduates relative to firms' expectations has not been explored in detail (Teijeiro, Rungo, & Freire, 2013).

The paper is organized as follows: a literature review is presented that evaluates the skills and competencies needed by graduates. The research questions and methods are then presented, followed by research findings, discussion and conclusions.

Education for sustainability: skills and competencies required by graduates

Dealing with complex problems and implementing more sustainable business practices requires specific values (Bhattacharyya & Biswas, 2020), competencies and personal characteristics (Osagie, Wesselink, Blok, Lans, & Mulder, 2014). Issues of intersectionality or interconnectivity arise when considering the role that universities and businesses play in the transition to more sustainable societies. As noted by Lozano et al., (2013), sustainability has to be a 'golden thread' throughout the entire organisation (i.e., where actors consider their resource use, energy use, emissions, ethical actions, and so forth) and solving complex problems demands collective responsibility. However, labour market experts are often unaware of sustainability challenges (Jelonek & Urbaniec, 2019). Students who leave university typically work under supervision and if their employers show little interest in sustainability, then it may make it more difficult for them to improve sustainability in their working lives and have a concrete effect on the industry in which they work. Therefore, it is important to consider the sustainability-oriented policies adopted by regional businesses, along with the barriers they face, since their experiences are legitimate and worthy of inclusion. It is argued that sustainability is essentially a question of value (Sidiropoulos,

2014), and education plays a role in strengthening students' actual values and creating 'agents of change' who are motivated to undertake more sustainable behaviours (Bremer & López-Franco, 2006). Accordingly, a strong multidisciplinary curriculum should have flow-on effects, where graduates can have a positive impact in their workplaces or in their communities.

The term 'Environmental and Sustainability Education' (ESE) is increasingly used to highlight the role of education in building people's capacity to deal with socio-ecological challenges (Aikens, McKenzie, & Vaughter, 2016). Yet, sustainability can be difficult to teach in a scholastic setting since teaching and learning strategies may be limited by the teacher's sustainability identity, their beliefs and personal understandings of sustainability (Almeida, Moore, & Barnes, 2018). Deep learning is very relevant to sustainability education (Grover, Emmitt, & Copping, 2019) and it represents a move beyond information transfer and has particular characteristics, such as being able to interact critically with content, to relate this to personal experiences and to draw logical conclusions (Beattie, Collins, & McInnes, 1997). Due to the holistic and often contradictory nature of sustainability, learning about sustainability requires students to adopt critical and reflective practices (Grover et al., 2019). It is argued that measuring 'learning gain' in higher education, defined as increases in knowledge, thinking skills, employability skills, and other attributes, is complex, involving philosophical questions of what to measure, and scientific questions on how to measure, and questions as to why such measurement is undertaken (Evans, Howson, & Forsythe, 2018).

Given that sustainability literacy has a direct effect on graduate employment prospects (Winfield & Ndlovu, 2019), it is essential that universities have formal curricula that expose students to different types of sustainability-related knowledge, develop awareness and critical thinking skills, promote environmental literacy and address unsustainable lifestyles (Jurdi-

Hage, Hage, & Chow, 2018). A meaningful strategy is to focus on competencies acquired by learner, defined as “the ability to successfully meet complex demands in a particular context through the mobilisation of psychosocial prerequisites (including cognitive and non-cognitive aspects)” (Giangradne et al., 2019, p.3). There is a long history of research into competency frameworks (Cebrián Bernat, Segalàs Coral, & Hernández Gómez, 2019) and several competency frameworks have been identified in the literature with different researchers emphasising different competencies, depending on the context and disciplinary focus (Jelonek & Urbaniec, 2019). For instance, Sleurs (2008) distinguished five competence domains: knowledge, systems thinking, emotions, values and ethics, and action.

Sustainability is said to be a multi-layered concept, with equity, social and racial justice as foundational elements (Brundiers et al., 2021). However, frameworks have been criticised for the lack of attention given to racial inequality (Valley et al., 2020). The concept of social sustainability is particularly relevant to Australia, a country where settler colonialism has led to the economic exclusion, dependency, and the near collapse of aboriginal culture (Bodkin-Andrews & Carlson, 2016). Today, there is growing agreement on the key sustainability competences that business professionals should possess (Brundiers et al., 2020). In a seminal paper, Wiek et al., (2011, p.204) state that “key competencies provide the reference scheme for transparently evaluating student learning and teaching effectiveness” and they are “critically important for curriculum design”. These five key sustainability competencies, which serve as clusters of related competencies, are namely, systems-thinking, anticipatory or futures thinking competence, values thinking or normative competence, strategic (or action-oriented) competence and collaboration (or interpersonal) competencies (Wiek et al., 2015). There is, however, little evidence that sustainability courses have long term impact or are better than the status quo (Wiek et al., 2011) and it is noted that “the most critical check for the adequacy of the competencies is the degree to which graduates can improve sustainability

in the world” (Wiek et al., 2011, p. 214). Therefore, our research agenda focuses on evaluating students’ competencies from the perspectives of regional employers.

The terms ‘skills’ and ‘competencies’ are used interchangeably in the literature, with debate extending over decades as to whether this is correct or whether they are different concepts (Sultana, 2009). We have adopted the stance that they are related concepts, with competencies being broader in scope, incorporating specific, usually taught, skills but also extending to include broader knowledge and attitudes that enable skills to be used in practice. Thus the ability to extract and interpret business research data would be a skill, and problem solving, a competency (Orinos, 2012; Parry, 1996).

We note that there has been a long history of debate regarding the relevance of business curricula to the business world and concerns regarding a perceived academic-practitioner divide, particularly in disciplines such as marketing (Brennan, 2004) and management (Stewart, Gold, Gray, Iles, & Watson, 2011). There is a natural alignment between the business discipline and ESE, given that graduates of business studies are future leaders, who are responsible for developing and implementing sustainability strategies. While there is evidence from a Spanish study that identifies both organisational and strategic capabilities as barriers to achieving sustainability (Murillo-Luna, Garcés-Ayerbe, & Rivera-Torres, 2011), there is a lack of proactive discussion regarding the role of universities in improving these capabilities. Employers seek graduates with both discipline-specific knowledge and generic ‘soft skills’ such as the ability to communicate effectively, interpersonal and team-working skills, problem solving abilities, adaptability and versatility (Clokier & Fourie, 2016; Finch, Hamilton, Baldwin, & Zehner, 2013; Helyer, 2011). There is evidence of ongoing employer dissatisfaction in many countries with the performance of graduates entering the workforce (Jackson & Chapman, 2012; McMurray, Dutton, McQuaid, & Richard, 2016). There is also evidence of some frustration among recent graduates that

some skills expected by employers had not been taught (Orinos, 2012). An examination of the changing expectations of employers, and the alignment of current business curricula with those expectations, would appear to be warranted. This study will therefore assist with the further refinement of the business curriculum, particularly in relation to strategies that are claimed to improve work-relevant competencies (Heiskanen, Thidell, & Rodhe, 2016).

Our research differs from the existing literature in relation to its context: the focus is on regional employers and their perspectives. The employers are based in a region that is heavily focused on expanding resource extraction, and research has found that the high school curriculum in this region is underpinned by a neoliberal agenda and Education for Sustainable Development (ESD) is not prioritized in the syllabus (Tomas, Mills, Rigano, & Sandu, 2020). Place-based approaches are important since climate change mitigation initiatives are being undermined by economic interests (Muroi & Bertone, 2019). There is a rich tradition of study into the skills and competencies required by employers (Baird & Parayitam, 2019; Abbasi, Ali, & Bibi, 2018; Hernández-March, Del Peso, & Leguey, 2009). However, a limitation of the literature is the focus on career-ready skills and competencies that help sustain business and grow the economy, rather than on the skills and competencies that help foster a more sustainable society. Environmental education is evolving with a new philosophy, which embodies a commitment to activism and the enactment of social change (Cole & Malone, 2020). Studies tend to focus on teachers and learners (Stevenson, 2007), such as students' environmental worldviews (Jurdi-Hage, Hage, & Chow, 2018), the response of undergraduates to the framing of sustainability in traditional degrees (Sandri, 2020), as well as on MBA students, their personal values, attitudes and subjective norms (Bhattacharyya & Biswas, 2020). This study offers a novel contribution to the research on environmental and sustainability education by examining whether regional employers value a focus on sustainability in the business curriculum, and are satisfied with graduates' skills and

competencies. Due to the global nature of climate change, a unified approach to combating climate change must include all levels of education and actors (Muroi & Bertone, 2019), including regional employers and regional universities. Furthermore, our study focuses on the outcomes of environmental and sustainability education, on acquired skills and competencies, recognizing that education must go beyond the goal of simply imparting knowledge (Jurdi-Hage, Hage, & Chow, 2018).

In order to develop an appropriate research instrument, we first reviewed the generic and specific sustainability-related skills and competencies claimed, in the academic literature, to be important. The skills and competencies listed in the left-hand column of Table 1 have been described as ‘meta-skills’ – i.e. not discipline-specific skills, but rather generic skills that apply across disciplines. We note that there is no agreement on exactly what these key competencies are (Barth, Godemann, Rieckmann, & Stoltenberg, 2007; Rieckmann, 2012), although there is substantial commonality across studies and also recognition of the need to “*mirror professional practice and test more than just rote memorization*” (James & Casidy, 2016). The right-hand column lists the additional skills and competencies identified as particularly important in sustainability and sustainable development contexts. We have marked with an asterisk those skills and competencies that are common to both lists, and with a # to indicate those for which there is a partial overlap. These generic and sustainability-specific competency skills sets have been the focus of much discussion in the academic literature (see, for example, Baird & Parayitam, 2019; Heiskanen et al., 2016; James & Casidy, 2016).

Table 1: Comparison of Most Commonly Listed Generic versus Sustainability-specific Skills and Competencies

Generic skills and competencies (Finch, Nadeau, & O'Reilly, 2013; Jackson, 2014; MacDonald & Shriberg, 2016)	Additional sustainability-specific skills and competencies (Heiskanen et al., 2016; Rieckmann, 2012)
Effective oral and written communication	Competency for systemic thinking and handling of complexity
Critical thinking *	Competency for anticipatory thinking
Interpersonal communication	Competency for acting fairly and ecologically
Leadership	Competency for participation
Ability to work in a team / collaborate *	Competency for empathy and change of perspective #
Ability to take initiative	Competency for interdisciplinary work
Ability to think strategically	Competency for communication and use of media
Ability to set priorities	Competency for planning and realizing innovative projects
Ability to follow through on tasks	Competency for evaluation
Ability to adapt to change	Competency for ambiguity and uncertainty and frustration tolerance
Ability to problem solve	Able to analyse interdependencies
Time management	Able to motivate and inspire others
Conflict resolution	Able to anticipate and estimate consequences
Able to be empathetic#	Able to be self-critical
Aware of cultural diversity	

* Also on list of key sustainable development competencies

partial overlap between the two lists

Research methods

The specific aim of this study is to investigate whether the generic and sustainability-oriented skills and competencies that are embedded in the business curricula are meeting the needs of regional employers. The study is a pilot study and the findings reported in this paper relate to an Australian regional university (i.e. based in a provincial city rather than a major metropolitan centre), as it is claimed that regional universities have a very specific role in helping regional organisations to address sustainability-related problems (Karatzoglou, 2013; Sedlacek, 2013).

The key research questions are as follows:

- (1) What are the generic and sustainability-oriented skills and competencies required of business graduates by regional employers?
- (2) Are regional employers satisfied with recent graduates' level of skills and competencies?
- (3) What recommendations do employers have for universities in relation to improving their education and training and instilling sustainability principles in the curriculum?
- (4) How do regional employers rate the importance of sustainability-related practices to their organisation?

An online survey was undertaken to address these research questions, and the target population was regional employers. Participants were recruited at university events aimed at the business community and through targeted emails sent by an industry association and local government to their members, such as the local Chamber of Commerce and Townsville Enterprise limited. Ethics approval for the study was obtained from the Human Ethics Committee at the authors' university.

The survey included a range of statements about climate change, risk denial and the respondent's personal beliefs and actions in relation to sustainability. These scales were validated in earlier studies of students enrolled on an undergraduate business degree (Eagle, Low, Case, & Vandommele, 2015) and those who had graduated from this program (Hay & Eagle, 2020). Employers were also asked to indicate the degree of importance attached to sustainability-related practices in their organization; the items were developed by the authors and informed by the literature (see for example, Murillo-Luna, Garcés-Ayerbe, & Rivera-Torres, 2011). These questions are important given that a match between graduate skills and employers' expectations is deemed important for employability (Teijeiro et al., 2013). The statements on skills and competencies were derived from previous studies (see, for example, Heiskanen et al., 2016; James & Casidy, 2016). The statements used a six-point scale with

anchor points of 5 = extremely important and 1 = not at all important, and 5 = strongly agree and 1 = strongly disagree and 0 = don't know.

Findings

The next section presents background information on the chosen university.

The university and adoption of sustainability as part of its strategic agenda

The employers' survey contained questions that related to graduates of one program, the Bachelor of Business Studies (BBS) degree from James Cook University, a regional university based in Townsville, Australia. Almost half of the world's population lives in the tropics, and climate change is expected to exacerbate the challenges faced by tropical nations (State of the Tropics, 2017). Not surprisingly, the university highlights its commitment to the principles of sustainability (JCU, 2018) and uses the SDGs as a framework against which their sustainability goals can be aligned. It is ranked number 1 in the world for partnerships for the UN SDGs, which looks at the broader ways in which universities support the SDG through collaboration with other parties and countries, the promotion of best practices and the publication of data (The World University Rankings, 2020).

Survey findings: graduates' skills and competencies and employers' perspectives of sustainability.

In the following section, the results of the online survey are outlined.

Descriptive statistics

A total of 29 usable responses were analysed. Small sample sizes are not uncommon and inferences can still be made, even with a very sparse data set of 29 responses (Chouinard, Wandschneider, & Paterson, 2016). The sample was successful in recruiting large employers of JCU graduates. Firms from diverse industry sectors responded to the survey, such as

professional, scientific and technical (n=5); financial services (n=4); public administration and safety (n= 2); health care and social assistance (n=3); other (n=3) and information media and telecommunications (n=1). Annual turnover ranged from less than \$100,000 per annum (n=4); from \$500,000 to less than \$1m per annum (n=3); \$10m or more (n=2) and six respondents preferred not to answer this question. The number of full-time employees ranged from 2 to 23,000; part-time employees ranged from 1 to 8,000 and casual staff ranged from 0 to 2,000. The number of full-time graduates employed by the organisations in the last five years ranged from 3 to around 1,000. When asked if their organisation reported on the 'triple bottom line outcomes', a third of the respondents (n=6) said yes, and the same number said no (n=6) and did not know (n=6). Of the people surveyed, 60% were male (n=12) and 40% were female (n=8). In terms of age, 20% were in the 25-34 age group (n=4), 30% were in 35-44 year age group (n=6), 25% were in 45-54 age group (n=5), 20% were in 55-65 age group (n= 4) and 5% were 65-74 year age group (n=1).

Sustainability-oriented skills and competencies of business graduates: requirements of regional employers and level of satisfaction

In order to address the first two research questions, employers were asked to indicate the degree of importance they attach to sustainability-related skills and competencies, and their level of satisfaction with the performance of a recent graduate on those same competencies (Table 2). All items were rated as important and they were dissatisfied with graduates in relation to the 'ability to analyse interdependencies'.

A paired sample t-test was selected to identify differences in relation to the repeated measurement of two constructs with two scales. Scholars note that the t-test, originally designed by Gosset (1909), can be used effectively with small sample sizes: "...fortunately, even for small sample sizes (less than 30), the t-test generates reliable results when the data are not normally distributed" (Sauro & Lewis, 2016, p. 74). The results show that there is a significant difference between the importance employers attach to five sustainability-oriented skills and competencies, and their satisfaction with the performance of recent graduates on those desired attributes. Respondents attached more importance to the ability to be self-critical ($M=4.50$, $SE=.204$) than to their satisfaction rating with a recent graduate ($M=3.31$, $SE=.338$). This difference was significant, $t(15) = 2.643$, $p=.018$. Respondents attached more importance to the ability to anticipate and estimate consequences ($M= 4.44$, $SE= .202$) than to their satisfaction rating with a recent graduate ($M= 3.50$, $SE=.329$). This difference was significant, $t(15)= 2.167$, $p= .047$. On average, respondents attached more importance to the competency for evaluation ($M=4.38$, $SE=.202$) than to their satisfaction rating ($M=3.25$, $SE=.403$). This difference was significant $t(15)= 2.149$, $p=.048$. Respondents attached more importance to the ability to motivate and inspire others ($M= 4.31$; $SE=.313$) than to their satisfaction rating with a recent graduate ($M=3.19$, $SE=.421$). This difference was significant, $t(15) = 2.218$, $p=.042$. Respondents attached more importance to the ability to

analyse interdependencies (M= 4.06, SE= .347) than to their satisfaction rating (M= 2.31, SE=.472). This difference was significant $t(15) = 2.941, p=.010$.

Table 2: Comparative analysis of importance and satisfaction ratings: sustainability-oriented skills and competencies.

	Importance for Organisation		Satisfaction with recent Graduate		p value
	Mean	SD	Mean	SD	
Statements about: specific sustainability-related skills and competency set, employees are expected to have.					
Ability to be self-critical	4.50	.816	3.31	1.352	.018
Ability to anticipate and estimate consequences	4.44	.814	3.50	1.317	.047
Competency for planning and realizing innovative projects	4.38	.806	3.50	1.414	.079
Competency for evaluation	4.38	.806	3.25	1.612	.048
Competency for participation	4.31	.793	3.56	1.548	.164
Ability to motivate and inspire others	4.31	1.250	3.19	1.682	.042
Competency for interdisciplinary work	4.25	.931	3.56	1.548	.208
Competency for empathy and change of perspective	4.19	.834	3.44	1.504	.125
Competency for communication and use of media	4.13	1.204	3.50	1.414	.214
Competency for ambiguity and uncertainty and frustration tolerance	4.06	1.124	2.88	1.586	.050
Ability to analyse interdependencies	4.06	1.389	2.31	1.887	.010
Competency for anticipatory thinking	4.00	1.512	3.07	1.792	.220
Competency for systemic thinking and handling of complexity	3.94	1.436	3.19	1.759	.266
Competency for acting fairly and ecologically	3.63	1.455	3.19	1.471	.443

Generic skills and competencies of business graduates: requirements of regional employers and level of satisfaction

Employers were asked to indicate the degree of importance they attach to generic skills and competencies, and their level of satisfaction with the performance of a recent graduate on those same competencies (Table 3). All items were rated as important, with higher scores attached to effective oral and written communication skills, interpersonal communication, ability to follow through on tasks and time management.

A paired sample t-test showed that there is a significant difference between the importance attached to five skills and competencies by an employer, and their satisfaction with recent graduates. On average, respondents attached more importance to interpersonal communication (M=4.88, SE=.085) than to their satisfaction rating of a recent graduate (M=3.94, SE=.281). This difference was significant, $t(15) = 3.174, p = .006$. Respondents attached more importance to ability to follow through on tasks (M=4.69, SE =.120) than to their satisfaction rating of a recent graduate (M=3.94, SE=.281). This difference was significant, $t(15) = 2.324, p = .035$. Respondents attached more importance to time management (M=4.69, SE =.120) than to their satisfaction rating of a recent graduate (M=3.88, SE=.256). This difference was significant, $t(15) = 2.657, p = .018$. Respondents attached more importance to ability to work in a team/collaborate (M=4.63, SE =.155) than to their satisfaction rating of a recent graduate (M=4.00, SE=.242). This difference was significant, $t(15) = 3.478, p = .003$. Respondents attached more importance to ability to adapt to change (M=4.63, SE =.125) than to their satisfaction rating of a recent graduate (M=3.69, SE=.350). This difference was significant, $t(15) = 2.457, p = .027$.

Table 3: Comparative analysis of importance and satisfaction ratings: generic skills and competencies

Statements about: generic skills and competency set, employees are expected to have.	Importance for Organisation		Satisfaction with Recent Graduate		p value
	Mean	SD	Mean	SD	
Effective oral and written communication	4.69	.479	4.00	1.095	.052
Interpersonal communication	4.88	.342	3.94	1.124	.006
Ability to follow through on tasks	4.69	.479	3.94	1.124	.035
Time management	4.69	.479	3.88	1.025	.018
Ability to work in a team / collaborate	4.63	.619	4.00	.966	.003
Ability to adapt to change	4.63	.500	3.69	1.401	.027

Critical thinking	4.50	.632	3.94	1.289	.188
Ability to take initiative	4.50	.516	3.88	1.025	.066
Ability to set priorities	4.50	.632	4.06	1.124	.203
Ability to problem solve	4.50	.516	3.69	1.302	.055
Ability to think strategically	4.44	.629	3.69	1.250	.068
Ability to be empathetic	4.44	.629	4.00	1.155	.130
Awareness of cultural diversity	4.19	1.223	3.94	1.181	.432
Leadership	4.19	1.109	3.94	.854	.432
Conflict resolution	4.06	1.063	3.75	1.065	.206

Recommendations of regional employers for universities in relation to improving their education and training and instilling sustainability principles in the curriculum

In order to address the third research question, employers were asked to indicate their level of agreement with statements concerning education for sustainability (Table 4). All items were rated as important.

Table 4: Attitudes towards education for sustainability

Statements about: education for sustainability	Mean	SD
Education should increase the knowledge of students of the role of renewable energy resources in helping to prevent climate change	4.12	1.275
Education should help students develop positive attitudes and values towards sustainability issues	4.31	1.320
Sustainability is a key factor in the future success of business	4.42	1.137

Respondents were asked, in an open-ended question, to reflect on what the university should do to teach sustainability to business students. Of the few responses that were obtained (n=8), two related to the triple bottom line, as indicated by the comment below:

“To reinforce the importance that society, the economy, and the environment are interconnected, thus students need to be aware of all three in their future work endeavours. They are after all the planet’s future, without emphasising sustainable behaviours and activities, it will be detrimental to the planet’s survival as we know it.”

One was focused on looking after limited planetary resources:

“To look after the planet for the future. That there are limited resources and if you don't look after them. They will run out. That if you sell the farm, you will have to pay others for the crop”.

Other comments related to the need to have a sustainability plan, adopt best practices and link sustainability to future success. Two comments related to attitudinal change, with the following comments typifying views:

“How to convince the older generations to employ sustainability initiatives as this is often where things fall down”.

“But you need first to teach adaptability and open minds. Many of your former students are not open.”

The responses were limited to the three pillars, measurement, sustainability planning and mindsets, suggesting that regional employers are interested in, and aware of, sustainability concepts. However, since they are not experts in sustainability, they are unable to act as knowledge producers and help address weaknesses in the curriculum.

Regional employers and the importance ratings given to sustainability-related practices in their organisations

To address the last research question, employers were asked to indicate the degree of importance attached to sustainability-related practices in their organisation (Table 5).

Statements were modelled on the ‘triple bottom line’ activities and some were rated as important, including recycling, contributing to community projects, having family-friendly policies, considering diversity in hiring decisions and promoting daily energy-savings. Items

that received the lowest scores were obtaining environmental certification (i.e., ISO 14001) and appointing a Manager for Energy or Sustainability.

Table 5: Importance of sustainability-related practices to the organization.

Statements about: importance of sustainability-related practices to the organisation	Mean	SD
Recycling (i.e., paper, cardboard, glass, plastic or aluminium cans)	4.20	1.155
Contributing to community projects	3.96	1.241
Having family-friendly policies (i.e., flexitime)	3.88	1.236
Supporting local suppliers	3.84	1.519
Considering diversity in hiring decisions	3.80	1.443
Promoting daily energy saving activities in offices (turning off computers, lights, air-conditioning, etc.)	3.68	1.651
Installing solar or other renewable energy source	3.48	1.558
Training of employees to raise their awareness of sustainability	3.32	1.651
Reporting social and environmental impacts in annual reports	3.32	1.749
Having eco-friendly merchandise or products	3.32	1.725
Setting targets for waste reduction	3.28	1.429
Setting targets for reducing electricity consumption	3.28	1.514
Using low-flow water devices	3.28	1.671
Using sustainability-related criteria in recruitment and selection	3.08	1.681
Obtaining environmental certification (i.e., ISO 14001)	2.80	1.826
Appointing a Manager for Energy or Sustainability	2.56	1.710

Discussion and implications for teaching and learning practices

A key research objective was to investigate the perceived importance of generic and sustainability-oriented skills and competencies by regional employers. All of the generic skills and competencies presented to respondents were seen as important or very important. These findings support studies that highlight the importance of soft skills or transferrable skills (i.e. teamwork, assertiveness, ability to work under pressure) to career success and the labour market (Caggiano, Schleitker, Petrone, & González-Bernal, 2020). Employers were then asked to critique the performance of a recent graduate on those same competencies and they were generally satisfied with the graduates. Significant differences between importance

and satisfaction ratings were found in related to five generic competencies. These are as follows: interpersonal communication; ability to follow through on tasks; time management; the ability to work in a team/collaborate, and the ability to adapt to change. Hence, instructors should take advantage of these insights and design assessment tasks in a way that strengthens these competencies. Assessments such as negotiation tasks, presentations, group work, interviews with managers or other stakeholders, are commonly used to develop interpersonal communication and continued use is recommended. Project management software and tools (such as Gantt charts) could assist planning and their inclusion in the curriculum is warranted.

A range of sustainability-oriented skills and competencies were perceived to be important by employers and they were generally satisfied with recent graduates, apart from one competence, the 'ability to analyse interdependencies'. Significant differences between importance and satisfaction ratings were found in related to five sustainability-oriented competencies. These are as follows: the ability to be self-critical; the ability to anticipate and estimate consequences; the competency for evaluation; the ability to motivate and inspire others, and the ability to analyse interdependencies. It is recognized in the literature that Education for Sustainable Development (ESD) must have three key features: the intent to develop citizens prepared to take action, the need for a holistic approach to ESD, and the goal for education to be transformational (Tomas, Mills, Rigano, & Sandu, 2020). There is, however, a debate in the literature as to whether some competencies are personal attributes of an individual and whether there may be specific competencies that some individuals will never be able to master (Sultana, 2009). Concerns exist that positioning young people as agents for change is idealized and aspirational (Walker, 2017), and this study's findings suggest that this may be true of recent graduates. Scholars such as De Haan (2006), Barth et al., (2007) and Michelsen and Adomsent (2007) suggest that the five competencies outlined

above are critical to sustainable education. Noting that employers have a responsibility to provide graduates with training and learning opportunities (Sultana, 2009), universities and employers may have to revise their expectations and accept the fact that some competencies will not exist at an early career stage and may evolve over time. Research has shown that many factors shape sustainability values, such as personality and social support in homes and communities (Waring, Sullivan, & Stapp, 2016).

There is, however, a vast literature on teaching and learning strategies that offers insights on how to develop graduates' competencies and meet the needs of regional employers. Scholars propose that sustainability learning in higher education should focus on learning content, pedagogy and the learning environment (Greig & Prindle, 2019). Some of the preferred procedures for developing students' competencies in sustainability are placements, internships and authentic 'real-world' projects (Bigg et al., 2018). Instructors in higher education could use assessment tasks that are problem-based (i.e., scenario analysis, forecasting, back-casting and case studies) and that generally encourage students to think about alternative futures and evaluate the consequences of different decisions and actions. Reports show that a range of innovative teaching and learning practices help instill sustainability competencies, including case studies, problem-based learning and reflective journal writing (UNESCO, 2012). Lecturers are advised to experiment with non-traditional pedagogical approaches and consider reflective journals, peer-review assessments or managerial-type feedback, so that a self-critical perspective is developed. Challenges are acknowledged, since an emphasis on self-reflection "...demands that individuals are honest with themselves and have a capacity for self-reflection, traits that are not always favored in contemporary formal education" (Giangrande et al., 2019, p.14). Practical tasks such as performing cost-benefit analysis could help graduates develop an ability to estimate consequences. Furthermore, incorporating gamification elements (Stanitsas et al., 2019) in

learning tasks may help develop a competence to ‘motivate oneself and others’. As noted by Caggiano et al., (2020), soft skills can be learned and traditional assessment methods, such as quizzes or exams, cannot accurately measure soft skills. Instead, ‘active learning’ (MacVaugh and Norton, 2012) and applied projects based on authentic, real-world challenges should aid learning trajectories. New forms of assessment may help learners develop a capability to be “future generators of sustainable value” (Kelley & Nahser, 2014).

Our findings report positive attitudes towards education for sustainability, however one factor, ‘using sustainability-related criteria in recruitment and selection’ received a neutral score, which confirms previous findings that sustainability knowledge and skills may not be seen as a high priority for employers when assessing potential employees (Ali, Murphy, & Nadkarni, 2017). This finding is surprising given that universities have adopted the SDGs and increasing importance is placed on embedding sustainability in the curriculum (Purcell, Henriksen, & Spengler 2019) as well as turning universities into ‘living labs’ or role models of sustainability practices through partnerships with external stakeholders (König & Evans, 2013; Verhoef et al. 2020).

Regional employers attached importance to some sustainable practices in their organisations, including recycling, energy-saving and supporting local suppliers. Equity-related policies were considered important, such as diversity in hiring, contributing to community projects and having family-friendly policies. However, the focus on the local rather than the global, and the lack of importance attached to items such as having eco-friendly merchandise and certifications, suggests a weak sustainability index (Nikolaou & Tsalis, 2018). Studies show a growing commitment on the part of CEOs to sustainability (Lans Blok, & Wesselink, 2014), however, our findings suggest that regional firms could do a lot more to protect natural and social capital. Two actions received the lowest scores, such as obtaining environmental certification and appointing a Manager for Energy or Sustainability.

The installation of solar panels received a score close to neutral (mean value of 3.48), which presumably is due to the cost of installation (Karakaya & Sriwannawit, 2015) or presence of other barriers to the adoption of proactive sustainability strategies (Murillo-Luna, Garcés-Ayerbe, & Rivera-Torres, 2011).

Finally, an open-ended question was designed to capture employers' views on what business students should be taught about sustainability and responses related to the three pillars, measurement, sustainability planning and mindsets. It was interesting that the SDGs were not mentioned, and this may be due to the lack of media attention given to the SDGs when the survey was conducted. The sparse responses suggest that employers are not experts on sustainability and have limited ability to act as 'co-creators of knowledge', i.e., where business people act as mentors and collaborate with universities to improve students' sustainability competencies (Soini, Korhonen-Kurki, & Asikainen, 2019).

This study raises two questions. Firstly, should sustainability education be positioned as core or peripheral to regional universities, given the weak interest displayed by regional employers' in the sustainability literacy of business graduates? Secondly, how can regional universities progress regional companies beyond the initial stage of sustainability awareness and the adoption of small, cost-saving operational changes? Answering these questions is a challenge, given that the commitment to sustainable practices by regional enterprise is weak, and there is some doubt as to whether graduates with a high level of competencies in the area of social and environmental sustainability are seen as a valuable asset by regional employers. We argue that there are ways to connect a shift towards sustainability to the values that employers already hold, such as hiring graduates with sophisticated soft skills. Other scholars have found that the capabilities sought by employers match those for sustainability, and hence the meta-topic of sustainability offers a 'win-win' situation for industry and academia (Thomas, Barth, & Day, 2013). Various commentators have argued that teaching practices

must facilitate the development of capable citizens who can instigate and manage change towards sustainability within an organisation, community or industry (Cole & Malone, 2020; Sandri, 2020; Tilbury, 2004). Furthermore, the opportunities offered by the ‘green’ economy justify the teaching of competencies in sustainability. In addition, Goody (2002), an anthropologist, argues that educational institutions are not the only social institutions through which individuals can develop competencies, and the cultural context and the roles of family and friends should be taken into account. Furthermore, given the barriers to sustainability education, such as the increasing casualization of academic staff (Green, Hammer, & Star, 2009) and the time and commitment needed to develop innovative teaching approaches (Backman et al., 2019; Kemper, Ballantine, & Hall, 2019), regional universities need support to fulfill their sustainability mission. Regional universities, on their own, cannot be the catalyst of sustainability values, given the complex nature of sustainable development (Tilbury, 2004). While recognizing that sustainability competencies are crucial to the business curriculum, there may be a need to reframe sustainability education as a process of acquiring a sophisticated set of soft skills, molded through lifelong education, influenced by personal and professional development and by other social institutions.

Limitations and future research directions

The limitations of this study include the use of a convenience sample, the small sample size and the self-selection bias. However, it is not uncommon to find studies with small sample sizes, given budget constraints and historically low response rates to surveys. For example, Wickramasinghe and Perera (2010) studied 26 employers to identify the skills gap of graduates. Acknowledging these limitations, this pilot study provides useful preliminary information that is currently lacking in the literature. Future research with a larger sample is recommended, where the focus could be on comparing the perspectives of regional

employers with those in major metropolitan areas, and other regional areas with a different mix of industries could be sampled. A follow-up study that focuses on curriculum redesign, academic staff and graduates, could be conducted to assess whether an improvement in generic and sustainability-related competencies (such as those identified in this study as needing improvement) was achieved as a result of changes to teaching and learning strategies.

Conclusions

This study is the first to evaluate how graduates' competencies and skills are meeting employers' needs in a regional setting. The recommendations for the faculty are to focus on curriculum design to improve specific competencies, including, but not limited to, interpersonal communication; time management; the ability to motivate and inspire others; the ability to anticipate and estimate consequences, and the ability to be self-critical. The regional enterprises have positive attitudes towards education for sustainability and attach importance to some sustainable business practices. However, sustainability competencies remain in the background during the graduate recruitment and selection process. The study concludes that a reframing of sustainability education is required and the capabilities sought by employers match those for sustainability.

Declaration of interest statement: the authors were employees at the chosen university and declare no conflict of interests.

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent: Informed consent was obtained from all individual participants included in the study.

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