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Developing Future Managers' Understanding of Complex Business Issues by Making Knowledge Visible: Tasking Business Students to Draw Pictures.

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Abstract

Traditionally educators within higher education have relied on in-class questioning techniques to establish and/or check students' understanding of complex business issues and the development of softer employment skills. However, whilst some students answer the questions set, many avoid raising their hands in case they give the wrong answer. This has two outcomes: firstly, it prevents students reflecting to recognise their knowledge, understanding and development of softer employment skills, and secondly it prevents educators getting a real understanding of whether students understand the topic or are developing their learning. This unwillingness to respond is now recognised as more prevalent in online learning, particularly where sessions are recorded.

To promote an alternative and more creative approach to checking knowledge, understanding and development of softer employment skills within management education, students are tasked with drawing a topic. Drawing can replace the tutor-centred check of understanding with a student-centred reflective learning task that makes knowledge visible. This can encourage students to think differently and reflect on their knowledge, which in turn may encourage them to recognise their own learning and skills development. In addition, the drawing can demonstrate understanding/misunderstanding and extent of learning for educators.

This paper explores the potential benefits of engaging business management students in developing an understanding of complex business issues and softer employment skills through drawing and uses the example of drawing sustainability to illustrate this. It will be of interest to educators within higher education and management training who need tools that promote different ways of thinking and enable them to understand students' knowledge. It will also be of interest to those seeking to promote reflective learning and develop teaching techniques that enable students to understand their own learning and development of skills.

Introduction

Over the last 150 years the scientific academic community has widely accepted that ‘a picture is worth a thousand words’, consequently, drawing has become a widely used learning tool within scientific higher education. Within the last few years it has become recognised beyond the scientific community that drawing can develop the understanding and communication of complex issues and promote the recognition of learning through the process of drawing (Boehm & Lees-Spalding, 1993; Quillin & Thomas, 2015). This suggests that it could also be beneficial in complex non-scientific subjects. Consequently, the author has adopted drawing activities to teach sustainability to business management students.

In this study the author defines the learning tool of drawing as:

“Activity that engages students in a process of visually representing their understanding of a topic to produce a pictorial output”.

Vygotsky (1978) suggests this pictorial output makes thinking visible and can enable students to demonstrate their knowledge through their drawing’s contents. From this perspective, drawing offers five positive learning opportunities:

1. A different way of thinking about complex business issues, which Roam (2013) suggests can lead to effective problem solving through visually processing information.
2. Drawing provides an opportunity for students to engage in self-analytical learning by reflecting on their knowledge, which Hind et al. (2009) and Schunk & DiBenedetto (2016) suggest can positively motivate learning.
3. Drawing can enhance knowledge retention as it encourages students to elaborate on meanings and reconstruct information in a way that makes sense to them (Terada, 2019; Ainsworth & Scheiter, 2021).
4. Pictorial outputs can offer tutors a chance to understand and benchmark students’ learning (Quillin & Thomas, 2015).
5. Group drawing activities can encourage students to work together to create a shared understanding (Ainsworth & Scheiter, 2021), which may promote softer employment skills of collaboration, negotiation, communication and influencing. Drayson (2015) suggests that these are the skills required for work-ready graduates. These skills are in short supply in graduates (Culpin & Scott, 2011; Sadler, 2016; Wilkie, 2019).

To explore the value of drawing for developing students’ knowledge and employment skills within a complex, non-scientific subject, a three-year study was undertaken between 2017 and 2020 into the effectiveness of drawing as a learning tool. The study engaged third year undergraduate business management students studying a business sustainability module. They were a pool of potential graduate recruits who could implement the knowledge and skills learnt to develop business from within. Their reflections on the value of drawing as a learning tool were collected in each of the three years of the study, and collated to explore and illustrate the effectiveness of drawing.

The paper will be of interest to educators seeking innovative learning tools to promote a recognition of learning and development of employment skills, and an opportunity to benchmark students learning. It will also be of interest to those seeking to recruit graduates with knowledge of complex business issues along with the important softer employment skills that can make them work-ready.

Making knowledge visible through drawing

Drawing is a means by which students can develop and record their thoughts and ideas. It may therefore support thinking and deeper learning by enabling students to apply what they have learned and recreate it in another format (Hope, 2008; Griffith & Burns, 2014; Adams, 2017). It is not possible to draw passively; all drawings require students to be actively engaged

(Ainsworth & Scheiter, 2021). Consequently, drawing may bring knowledge to life and offer the pedagogic approach that students prefer (Oblinger & Oblinger, 2005; Abdel et al. 2017).

Although drawing is frequently seen as a teaching tool for primary school pupils, it is also used in Higher Education's scientific subjects. In subjects such as biological sciences environmental studies, geography and geology, drawing is frequently used to test ideas, elaborate knowledge, and imagine new relationships (Quillin & Thomas, 2015). Ainsworth, et al (2011) suggest drawing within these subjects can promote deeper understanding of complex subjects as students are encouraged to create their own visual representations.

Students' analytical skills may be developed through drawing (Ainsworth et al. 2011). This may be due to the need to evaluate knowledge, review understanding and undertake critical thinking when producing a drawing (Quillin & Thomas (2015). In turn, this may produce self-efficacy, which can emanate from the ability of drawing to build self-esteem and self-confidence and make students more self-aware of their own learning as they see their previously unseen knowledge pictorially (Jones, 1997; Quillin & Thomas, 2015).

Incorporating drawing within teaching can offer students a learning activity that can stimulate reflective thinking, the visualisation and interpretation of information and communication of results (Roam, 2013). This reflection has a key role in developing knowledge and understanding (Schon, 1987) and can encourage students to develop explicit thinking that helps them to share and explain their ideas with their peers (Ainsworth et al. 2021). This may result from the fact that drawing is able to make ideas tangible and thinking visible (Vygotsky, 1978).

In addition to using drawing as a technique for individuals to recognise their knowledge, learning through drawing can offer additional value to educators (Gobert & Clement, 1999; Hay et al, 2008). Drawing can expose misunderstandings (Dikmenli, 2010), develop communication skills (Roam, 2013), enhance motivation, inspire learning (Glynn & Muth, 2008) and enable students to connect ideas and beliefs (Long et al, 2014). Extending this view of drawing as an enabler of connections, it can also be an enabler of information exchange as the visual output represents a record of an individual's thinking and understanding (Brooks, 2005). When reviewed by the educator, an understanding of the student's progress can be gained and benchmarks for future learning can be established.

The pedagogic benefits of drawing as a learning tool will help educators to support and guide students to understand the complexities and interrelated challenges and opportunities inherent within business sustainability. Drawing achieves this by enabling students to shape their reflection on learning through their own ideas (Ainsworth et al. 2011) as well as framing visual outputs through their own learning lens. Consequently, drawing can be an effective formative information exchange exercise that scaffolds learning and facilitates targeted feedback (Quillin & Thomas 2015), which in turn can prepare students for future learning (Schwartz & Matin 2004) and the challenges of the future workplace.

Alongside these benefits of drawing as a learning tool, drawing has a specific value for teaching sustainability within the business management curriculum. This is a complex subject involving environmental protection, economic legitimacy, and social justice, which are frequently new to business management students.

Drawing is specifically valuable within sustainability teaching as it encourages the learner to see the world differently (Unicheck, 2015), which UNESCO, (2017) considers a vital requirement for effective development of a sustainable future. Students, who will be the managers of the future who will have the power to change businesses from within. They will be required to think differently to overcome current sustainability challenges and transform the way organisations think and act.

Drawing Sustainability as a learning activity

This paper uses an example of incorporating drawing in a third-year sustainability module in the business management curriculum to explore and illustrate the value of drawing as a learning tool. Within this third-year sustainability module students working in groups are tasked with drawing their understanding of sustainability in the first and last lectures of the module. As learning is fundamentally a social activity (Dewey, 1916), the activity of drawing sustainability is conducted in small groups of two to five students. These groups are self-forming and appear to comprise friendship groups that are established at the start of the first lecture and endure throughout the lecture series. To ensure inclusivity is maximised, students preferring to work on their own may do so. After completing their drawings one or more members of each group present the group's drawing to the class, including a description of the content and the rationale for including these items.

Completing drawings at two points in time enables students to capture and demonstrate their knowledge before studying sustainability and after engaging in 12 lectures. They can then compare the visual representations of their knowledge and establish their development of knowledge and cognitive skills. After the second drawing activity the students are asked to reflect on the activity of drawing and provide feedback on their experiences.

Prior to 2020 students used flip-chart paper and marker pens in four colours. This encourages thinking in a different way, applying knowledge rather than verbalising it and reflecting on knowledge to select, organise, and integrate information (Quiller & Thomas, 2015). With the onset of online lectures in March 2020, pens and paper were replaced with PowerPoint slides and digital drawing tools for the second drawing session. An online survey replaced the paper survey that had been used to collect students experiences in previous years.

Students' Value of Drawing

Perceived Value of Drawing as a Learning Tool

Whilst the theoretical pedagogical value of drawing is generally accepted, it is important to understand the practical value of drawing as a learning tool so that business management students' sustainability knowledge and employment skills can be highlighted, and recognised by, themselves, educators and graduate recruiters. The students' reflections, which have been collated across the three years of this study, are quoted verbatim to capture the students' voice and illustrate the value they see in drawing.

Students' feedback suggests that drawing sustainability may help them to reflect upon and recognise their own learning. Students reported:

"I started with no knowledge and now I can see I am quite good."

"Using pictures contributed to my sustainability knowledge."

"Drawing helped me test my current knowledge."

"I can see I have gained new skills and knowledge."

These comments suggest that students appreciate the activity of drawing as a tool enabling them to reflect on and recognise learning. This may be useful knowledge for educators developing new learning activities and those seeking to promote students' self-awareness and recognise their learning progress.

Within the experience feedback collected after the second drawing session in each year of the three-year study, third-year undergraduates also identified that drawing helps them to understand complex business issues. Students reported:

"Makes business issues more understandable and real."

"Showed how easy it is to integrate information to develop solutions."

"Made me realise how sustainable we need to be in order to save the planet."

This feedback suggests drawing can enable students to think differently to break down and classify complex issues into more simple, individual components. This recognition may be of use to educators seeking to support students in gaining an understanding of how complex business and academic environments can be. It may also be of interest to those seeking to recruit work-ready graduates.

Perceived Value of Drawing for Developing Employment Skills

In addition to the development of knowledge and employment skills, the outcomes suggest drawing can also influence individuals' values, encourage different ways of thinking and promote personal sustainability practices.

Students' reflections recognise they developed greater confidence and higher order cognitive skills such as critical thinking, collaboration, communication and influencing by visually representing their knowledge. Students reported:

"Helped me improve my critical thinking and analysis as I now take into account other people's arguments and views."

"Has given me a better understanding of how to communicate my ideas."

"Helped me to become more confident about demonstrating my opinion."

"Made me develop more innovative ways of thinking."

"Encouraged me to collaborate with individuals who provide interesting views."

The feedback collected suggests that participating in drawing activities and reflecting on the pictorial outputs can develop employment skills, which can help students to become work-ready graduates. This will be of interest to those seeking to enhance employment skills for undergraduates to become work-ready graduates.

Across the three years of the study, students recognised that drawing promotes alternative ways of thinking, in a way that Laurie et al (2016) have found to be important for sustainable communities.

Students reported:

"I now talk about global topics."

"I now take a personal view."

"I now care about better solutions."

"Drawing can help you think outside the box and challenge yourself."

These comments suggest that students recognise that drawing changes their personal values and behaviours. This is important to both educators and graduate employers as these new values and an understanding of good practice can enable students to contribute to sustainable futures, both in their home lives and help them to change business from within.

Conclusion

Whilst drawing has traditionally been used as a learning tool within primary education and scientific subjects in higher education, this study suggests drawing can also be a valuable pedagogic tool within non-scientific, complex subjects and teaching environments that require students to recognise their learning. This may apply to subjects taught within business management curriculum, particularly those which are new to students such as business sustainability.

This study suggests that drawing can effectively deliver a recognition of learning by encouraging students to reflect on their knowledge and visually process it to make their understanding visible. Within this, drawing can also provide an opportunity for educators to

recognise students' knowledge and understanding. The activity of drawing emerges in the study as an opportunity for students to develop employment skills.

The visualisation and interpretation of information and communication of results can promote critical thinking, collaboration, communication and influencing skills that are recognised as missing in many graduates.

Within the topic of sustainability students' reflections on drawing suggest that it also empowers them to form an image of their knowledge that they can reflect upon, and through this, relate personal practices towards the environment and society. The changing values and behaviours reported in the feedback suggests drawing may encourage students to become change agents who, in their future careers, will be able to change businesses from within.

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