Why Information Systems Should Adopt an Interdisciplinary Approach to Teaching Sustainability

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Why Information Systems Should Adopt an Interdisciplinary Approach to Teaching Sustainability

Abstract

Sustainability is a challenge across societal boundaries, and yet when academics research or teach the subject they tend to focus only through the narrow dimension of their discipline. In 2020, academic colleagues at Victoria University of Wellington came together to launch an interdisciplinary sustainability course combining expertise from the Schools of Marketing, Government and Information Management. By bringing together three disciplines students were given a broader understanding of how policy can be operationalized using digital technology and how marketing can be used to encourage associated changes in behavior. The interdisciplinary approach is not without its own challenges, and in this case study, we will highlight key points for academics who are considering engaging with colleagues from other disciplines to teach sustainability issues.

Keywords

Sustainability, higher education, interdisciplinary, information systems, marketing, policy

Introduction

Sustainability is a challenge across societal boundaries, and yet when academics research or teach the subject they tend to focus only on the narrow dimension of their discipline. Despite this there is widespread agreement on the value of interdisciplinary teaching in sustainability education due to the complex and interrelated nature of the topic (Feng 2012). Sustainability issues are ‘wicked’ problems (Kwakkel et al.).
2016; Peters 2017) that are dependent on the integration of knowledge across many disciplines to solve real-world issues (Coops et al. 2015).

Information systems academics have been called on to address sustainability issues in their teaching and research (Watson et al. 2021). Collaboration with organizations outside the discipline is regarded as a key element. Digital technology is now an integral aspect of everyday work, and this puts the onus on those working in the digital sector to build the skills to collaborate with other subject areas. As a transformational technology, ICT has the potential to make a significant contribution to sustainability goals, however, to achieve effective change, the power of technology needs to be combined with effective policy making and communication. For example, massive amounts of data are available at the national, regional and local government levels, but to unlock the value from that data for public good, there needs to be an understanding of the political and social environment. If not used wisely data overload can hamper decision-making rather than assist.

Other recently touted technological solutions, such as digital twins which can be used to visualize building and infrastructure for smart city developments, need to be clearly aligned with policy if they are to be an effective force for change (Smart Cities Council 2021). For instance, a digital twin for a carbon zero city would not be effective without an understanding of the resource management and climate change legislation. In order to use technology to achieve sustainability goals it is a necessity to understand policy, how technology can be used to operationalize policy and how marketing can be used to promote understanding and encourage social acceptance of change. For example, a digital twin can be used as a visualization tool to facilitate communication within the community in order to obtain citizen feedback. Technologies for sustainability are situated in a broader economic, regulatory and ecological environment and to be effective there must be an understanding of how the system operates as a whole. A digital twin is not just for keeping track of infrastructure or building management, the motto is 'Digital twin for All', promoting inclusivity and this needs to be core to the mission if such technologies are to achieve sustainability goals (Smart Cities Council 2021).

In a dynamic area such as sustainability it is a challenge for policy to keep up as technology and perceptions of the public good are rapidly changing revealing a growing gap between social understandings, policy and practice. To address this issue and develop dynamic frameworks for change, collaboration between different areas is essential.

Adopting an interdisciplinary approach is a particular challenge for IT related subjects such as information systems where sustainable development is not generally part of the curriculum (Hilty and Huber 2018). Though the transformational power of IT is widely acknowledged there is limited discussion about the purpose of that transformative power. Aligning digitalization with sustainable development has the potential to make a substantial contribution to a sustainable future. A 2014 survey of 256 first year IT students in New Zealand polytechnics found that though students were generally pro-ecological they were ethically naïve - highlighting the need for education on IT and sustainability (Mann et al. 2015). One way of motivating IT students to engage with sustainable development is to use systems thinking to form a bridge between computational thinking, social issues, value judgements and ethical dilemmas (Hilty and Huber 2018). Though IT students are more likely to be interested in content on sustainable development if it is related to their subject area, technical content needs to be studied alongside economic, humanitarian and societal issues through the lens of systems thinking (Hilty and Huber 2018).

This paper explores the issues involved in establishing interdisciplinary teaching in the tertiary sector using a case study of one course taught by three different subject areas at Victoria University of Wellington, New Zealand. Both the benefits and challenges of adopting an interdisciplinary approach to teach sustainability are highlighted. The literature review provides a brief history of sustainability teaching in higher education and makes a case for the use of interdisciplinary teaching. The differences between the multidisciplinary, interdisciplinary and transdisciplinary approaches are explained. The next section explains how the hierarchical infrastructure of a typical university is a barrier to the interdisciplinary approach. Despite being championed by senior leadership and academic staff, long standing administrative processes act against cross faculty cooperation and change. The following sections focus on the set up of the course and the steps that were taken to develop interdisciplinary learning. A key aspect of this was the assessment strategy and the way this was designed to gradually introduce students to the interdisciplinary approach is explained in detail. The outcomes for the students who took the course are reported and the paper finishes by highlighting the key learnings obtained from the first iteration of the course.
Literature Review

Higher education institutes around the world have responded to the need for sustainability. Many have joined the United Nations Sustainable Development Solutions Network or organizations such as the Association for the Advancement of Sustainability in Higher Education or the Environmental Association for Universities and Colleges (Soini et al. 2018). A common theme running through these networks is a commitment to the United Nations (UN) 17 Sustainable Development Goals (SDGs) and the Paris Climate Agreement of 2015. Another trend is for universities to establish sustainability centers which promote interdisciplinary research and sometimes also teaching. ‘Greening’ the campus by introducing recycling issues and promoting e-transport is also popular (Higgins and Thomas 2016).

The process of integrating sustainability into the curricula, began in the 1980’s when some universities began to address environmental issues through technological developments in engineering and science. In the 1990’s as public commitment to environmental issues grew, sustainability was integrated more broadly into the universities activities. In the 2000’s university commitment to sustainability research, teaching and practice deepened and was referred to as the sustainability transition of universities (Soini et al. 2018). Part of this commitment includes a desire not just to teach theoretical content but to link theory to action. The link between sustainability theory and sustainability action involves understanding complex socio-ecological systems and crossing disciplinary boundaries. The terms sustainability and sustainable development are often used interchangeably, both terms relate to the “growing awareness of the global links between mounting environmental problems, socioeconomic issues to do with poverty and inequality and concerns about a healthy future for humanity” (Viegas et al. 2016).

The complex issues raised by sustainability transcend disciplinary boundaries and often courses are interdisciplinary or multidisciplinary, in order to achieve integration among different subject areas. Systems thinking is commonly used, co-design with students is also favored, project-based work is also popular. Despite apparent agreement on the necessity for an interdisciplinary approach the literature notes the challenges with curriculum change in the university environment. Universities are siloed institutions with strong discipline boundaries and management and financial structures actively constrain interdisciplinary teaching (Aktas 2015). Silos are a barrier to problem driven and solution orientated fields like sustainability that rely on the integration of knowledge and action across multiple disciplines (Coops et al. 2015). Shifting to systems thinking and interdisciplinary collaboration requires a paradigm shift from the dominant monodisciplinary culture. It is also necessary for university administration to accept approaches other than a disciplinary-based model. Currently funding systems do not reward interdisciplinary teaching and research (Soini et al. 2018).

Most higher education institutions focus on producing graduates who are experts in a single discipline even though students are immersed in an interdisciplinary environment once they start work. The situation in teaching is also reflected in research as the traditional disciplines are still granted higher recognition despite an acknowledgement of the need for interdisciplinarity. Sustainability encompasses environmental, economic and societal issues meaning solutions to real-world problems can only be found by crossing existing boundaries (Aktas 2015). Institutional culture needs to be taken into account when trying to achieve curriculum change, especially at the transformational level being called for by sustainability educators (Higgins and Thomas 2016). There is some evidence to suggest that universities are paying lip service to sustainability and do not understand the true nature of the challenge. For example, while campus greening initiatives are laudable they are not sufficient on their own and only marginally influence student learning (Higgins and Thomas 2016). Truly transformative curriculum change requires alteration to administrative structures and attitude change in organizational culture. Universities are complicated organizations with unique characteristics and there is broad agreement amongst educational researchers that achieving organizational change in universities is a challenging task and takes a long time, suggesting the change agenda needs to be tailored to the specific institutional culture in order to be effective (Higgins and Thomas 2016).

The motivation to achieve change is generally driven by academics’ concern for their students’ learning, and it is most likely to be effective when students and academics work together, taking account of institutional context (Higgins and Thomas 2016). Other factors which positively influence change in higher education are clear metrics for measuring success and communicating to all sectors of the university how their work contributes to the overarching goal (Higgins and Thomas 2016).
Teaching in sustainability is typically multidisciplinary or interdisciplinary, in part because of the variation in circumstances across different sectors which often create tensions between actors, yet the breadth of approaches to sustainability theory and applied solutions, lends itself to collaboration between different disciplines (Soini et al. 2018). Disciplinary teaching represents a bounded way of understanding using a shared language, rules and institutions (Feng 2012). In multidisciplinary teaching educators from different subject areas work on a programme together to deliver insights from their own subject area but have limited interaction with each other and there is little integration between the fields (Aktas 2015). One example of a successful multidisciplinary course involved a course coordinator who attended all sessions and assisted the students in putting together the material provided by the contributing subject area lecturers (Coops et al. 2015). Interdisciplinary teaching takes this a step further by integrating traditionally separate fields of study. Lecturers co-teach on the same course and ensure that teaching material from contributing disciplines is complementary and that assignments bring together learnings from the different subject areas, to create a community of learning (Feng 2012). The transdisciplinary approach takes this further still by removing traditional discipline boundaries and even developing a unique epistemology. An example of the transdisciplinary approach is the growth of environmental studies (Aktas 2015). Transdisciplinary courses are premised on the acceptance of non-academic knowledge and are not fully practical in most universities at present (Viegas et al. 2016). Multidisciplinary research is often more theoretically orientated, while interdisciplinary and transdisciplinary approaches aim for a deeper collaboration and even to surpass subject boundaries (Soini et al. 2018). There are a number of flavors of these different approaches, for example interdisciplinary teaching can consist of team-taught courses, or courses that are taught separately but with lecturers working together to highlight linkages between their subject areas (Feng 2012).

In Wellington School of Business and Government (one of nine faculties in Victoria University of Wellington), a multidisciplinary approach has been taken for many years. All students taking the Bachelor of Commerce study seven core subjects at 100 level before specializing in one or two majors. The common core provides every student with an introduction to accounting, economics, government, information systems, management, marketing and quantitative skills. In theory this means that students can make connections between the different subjects as they progress through their degree. In practice the outcomes are mixed. Students tend to compartmentalize their courses and find it hard to relate material from different subject areas. Over the years there have been attempts by the Course Leaders of the seven common core courses to coordinate teaching and assignments and even to introduce an overarching capstone course. However, though such initiatives work for a time, it is a challenge to maintain ongoing momentum.

University Infrastructure

Like most universities Victoria University of Wellington is concerned about sustainability and has made a firm commitment to the UN's Sustainable Development Goals. In 2016, the university became the first in Australasia to create a senior leadership position dedicated to sustainability with the appointment of an Assistant Vice-Chancellor (Sustainability) (Sustainability Office 2016). Prior to 2016 the university's sustainability strategy focused on environmental management including more efficient running of buildings, reducing electricity usage, extending the length of lease agreements for computing equipment, better management of waste, and cutting greenhouse gas emissions. Concurrent with the appointment of the Assistant Vice Chancellor (Sustainability) the university established a Sustainability Office. These two actions were the signal for a transition from a focus on environmental management to a strategic and long-term commitment to sustainability across all aspects of the university (Sustainability Office 2016). One of the first projects undertaken by the Sustainability Office was to map how well the university's course offerings aligned with the UN's 17 Sustainable Development Goals. The mapping exercise was completed in 2017, at a time when the university offered more than 3000 courses of which 330 (11%) included content relevant to the SDGs (Sustainability Office 2017). Particular strengths were in Goal 8: Good Jobs and Economic Growth, Goal 9: Innovation and Infrastructure and Goal 16: Peace and Justice. Goals where there was insufficient coverage included Goal 3: Good Health, Goal 7: Renewable Energy and Goal 11: Sustainable Cities and Communities. Content relevant to the SDGs was offered in every school in the university. The faculties with the highest percentage of relevant courses were Law, Science, and Architecture & Design, with Engineering having the lowest percentage. Mapping was viewed as a first step to monitor and develop better communication internally and externally about Victoria University of Wellington's contribution to the SDG's (Sustainability Office 2017). An initiative to foster interdisciplinary research around sustainability, ‘Enhancing Resilience and Sustainability of our Natural Heritage and Capital’, was also established in 2016.
A networking day attended by more than 50 researchers was held and funding was made available for interdisciplinary research projects.

Though different aspects of sustainability were reasonably well covered throughout the university there was a lack of communication and coordination; for a student interested in sustainability there was no easy way to plan a cohesive study path. Like many universities there was widespread availability of courses focused on sustainability for the later years of undergraduate study, but few early entry level courses and none broad enough to apply to all disciplines (Coops et al. 2015). As a first step, a cross university working group developed a pan-university entry level sustainability course as a multi-disciplinary introduction to sustainability with content from all nine faculties. There was great enthusiasm from the working group, however the course very quickly hit snags when trying to fit in with the university’s structure and systems. For example, with no home faculty there were no professional staff to provide administration and there was no clear way to organize finances in terms of the contribution of individual students taking the course and staff teaching it. For students the course would count only as general credit rather than giving points towards a specific elective or degree, which was problematic for Commerce, Science and Law programmes where student timetables are very full. Planning for the course was abandoned due to these institutional obstacles.

Despite these setbacks, enthusiasm for teaching sustainability related courses remained and both the number of courses with a focus on environmental sustainability and the number of student enrolments continued to grow. In 2020, the university offered 96 sustainability related courses, which attracted more than 5,500 enrolments (Sustainability Office 2020). Though most courses were offered within one individual school there was still enthusiasm for interdisciplinary teaching of sustainability. For example, a lecturer in the School of Design collaborated with Faculty of Education staff to develop a co-taught course with financial and administrative matters being managed by Design. A Master of Climate Change Science and Policy was established in 2018 with input from both the schools of Geography and Biology, though again owned by one school, Biology.

The failure of such an entry level university wide course was also described by Coops et al (2015). The University of British Columbia developed a university wide entry level sustainability (Coops et al. 2015). Considerable resources were put into this course, which was developed by six teaching fellows, one of whom attended every class to ensure the students had consistent guidance. Though the course received positive student ratings and was proved to be financially viable, it was not offered for a second time. This was in part due to the administrative overload, the course had to be offered under five different course codes, one for each faculty, and examination timetabling was an issue. Coordination of the teaching team also proved to be time consuming, it became clear that a course involving team teaching and experiential learning required significantly more resources than a standard lecture course (Coops et al. 2015).

**Sustainability, Business, Society**

**Institutional Context and Process**

Staff within the Wellington School of Business and Government (WSBG) were keen to progress interdisciplinary sustainability education. Although WSBG is termed a school it is in fact a faculty consisting of six different schools teaching commerce related subjects. Staff were keen to establish a minor in sustainability management that could be combined with majors within the Bachelor of Commerce degree. A sustainability minor would ensure that students who wanted to study sustainability had a clear pathway and could build their course points towards a defined outcome. Staying within one faculty and one qualification would also simplify administration and finance. One avenue to promote this approach was through WSBGs membership in Principles of Responsible Management Education (PRME). PRME is a global platform which promotes sustainability and the SDG’s in business schools. WSBG has been a member since 2014. Even though the PRME Steering Group strongly supported the idea, it was foreseen that setting up a new minor even within one faculty would be no easy task and getting the programme approved would take time. To progress integrative sustainability education within the faculty it was decided to pilot one course as a special topic, establishment of which could be done relatively easily.

All six schools in the faculty were approached to contribute to the pilot course and three agreed to participate, The School of Government, the School of Marketing and International Business and the School
of Information Management. Heads of Schools work around full or half courses, and ensuring their own school meets its budget is an important part of their role. Therefore, it is not really in a Head of School’s interest to let one of their own staff teach in another school for less than half a course. The reason these three schools participated was due to the enthusiasm of individual academic staff. Schools are compensated for teaching on a course according to the number of equivalent full-time students (EFTs) the course attracts, and the three Heads of the different schools needed to agree how the EFTs for the course would be divided. This all results in extra work for professional staff in each of the three schools, for example in the development of contracts and transfers of funds.

There is undoubtedly personal risk in teaching on an interdisciplinary course. There’s a risk of failure in design and delivery. You need the support of Heads of School for this to work and Faculty-level endorsement is crucial. To make a course open to a broad range of students where there were no prerequisites is itself very challenging. We had students of business and government, architecture, journalism and engineering. That was a sign of both the potential risks and rewards of the interdisciplinary approach.

**Course Design and Delivery**

The overall aim of the course was to examine the concept of sustainability in the context of societal and business value shifts using perspectives from information systems, marketing and public policy. Problem-based learning approaches were used to explore interplays between economic, socio-cultural and environmental aspects of sustainability. There were further challenges with course design and the need to avoid course fragmentation while bringing together the best of each discipline. Lectures and assignments were designed to show the clear linkages between, for example, social policy and social marketing, and the need to build clear new structures enabled by information management.

Course Coordinator, Valentina Dinica noted that: “It was hard work to get a balance, such as with assessment design. Our teamwork was very positive – academically and personally. You need to be flexible. You need to be more willing to learn than to be right and we learned a lot from each other! There are even challenges when a student asks a question, as to who the best person is to answer. We had far more meetings than usual to design, organize and operate the course, develop assessment, and to ensure pre- and post-marking moderation.”

The course was delivered with eight contact hours in two face-to-face lectures by each lecturer – all were recorded – for each of the first two weeks, after which all lectures were delivered asynchronously via recording. The lecturers cycled through in turn. Tutorials were delivered via Zoom involving all three lecturers. The split between online and face-to-face caused some issues with attendance. The philosophy behind this approach was to use the face-to-face sessions to build a cohort feel for discussion and interaction before the students departed for the summer and the online only phase began. However, the attendance at these first sessions was disappointing with many students preferring to watch a recording of the lecture. An approach adopted to encourage participation throughout the online course was to have regular small assignments to ensure students maintained engagement with course material. Though this approach was successful as any drop off in engagement could be quickly identified and followed up, it did mean there was a heavy assessment load on the students and an associated heavy marking load on course staff. It was also difficult to ensure that small assignments integrated all three subject areas and three of the smaller assignments were in fact related to only one specific subject area.

**Designing Interdisciplinary Assessments**

Designing truly interdisciplinary assessments was a key part of ensuring all three subject areas were fully integrated. The course lecturers spent considerable time planning the assessment strategy for the course. Two strategies were employed. There were four smaller ‘low stakes’ assignments to encourage ongoing student participation and quickly identify any lack of engagement. These took the form of quizzes and blogs. One quiz was designed as a multidisciplinary assessment and included a set of questions from each of the three subject areas which were marked separately. The other three smaller assignments were designed and marked by the individual academic covering that subject area. These assignments comprised 35% of the course mark, the rest of the assessment was made up of two major integrated assignments, a problem-based report and poster (25%) and a sustainability plan (40%). There was no final examination.
The two major assignments were based around ‘wicked’ problems (Kwakkel et al. 2016; Peters 2017) that required an understanding of all three subject areas in order to address the complicated issues raised. The first of these assignments was a problem-based report and poster which examined the issue of food waste and required students to write a short report for an environmental NGO that was aimed at the public, business and government decision makers. In addition, students were asked to design a poster for online public display. This assessment introduced students to the interdisciplinary approach by requiring students to explain how policy interventions that would be suitable for the given policy objective and timeframe could be implemented by means of information systems in businesses, business specific measures and marketing strategies that aligned with policy and business interventions. Course lecturers designed an assessment rubric which identified how marks would be allocated for each of these aspects. The rubric was shared with students and it was made clear to them that they had to cover all the required tasks at a minimum level to pass the course and more fully if they were aiming for a good grade. Grading considered the fact that the report was probably the first assignment requiring interdisciplinary thinking that students at 200 level would have come across. Feedback to students included advice on how to strengthen the interdisciplinarity of their recommendations and analyses.

The other major assignment, the sustainability plan, also addressed a wicked problem whose solution required input from all aspects of the course. With the learnings from the first major assignment, the challenge in the final assignment could be ‘stepped up’. Students were asked to address the issue of reducing plastic packaging and to develop a ten-year policy for a major supermarket chain. Again, the assignment was carefully designed to ensure there was input from all three subject areas. As well as having an overview of the business situation, the students were required to address perspectives from policy, marketing and information systems. An example of the assessment rubric for the sustainability plan assignment is shown as Appendix A. The rubric was carefully designed by the course team to provide detailed guidance to students on assignment requirements and how to integrate the different areas of course learning materials.

The transition towards interdisciplinarity needs to be embedded in the design of assessments, starting with some smaller monodisciplinary tasks multidisciplinary assignments before transitioning to interdisciplinarity by means of phased assignments which guide students through an appreciation of what interdisciplinarity involves and how it can be achieved.

In addition to the effort put into designing the assignments and associated rubrics, the course teaching team also took an integrated approach to marking. Rather than opting for horizontal grading, where each lecturer marks their own section of the assignment, a holistic approach was used. This required the course team to develop an understanding of each other’s subject areas. Though the team had collaborated to design and deliver the course, ensuring that each team member was able to consistently evaluate student work which covered all three subject areas required considerable planning. To achieve standardization with assessment, the following approach was used. There was a pre-moderation meeting prior to marking being distributed. Before this meeting each marker assessed the same three assignments, at the meeting the course team discussed and compared their marking with reference to the assignment rubric. This ensured we had a common understanding of how to evaluate the different criteria in the rubric. The assignments were then randomly divided up for marking amongst the course team. During the individual marking stage there was some communication between staff if they came across something they felt was outside their subject expertise. Once marking was complete, a post moderation meeting was held to compare marks for all areas of the rubric, discuss any anomalies and agree final grades. This approach was dependent on consensus and team members being willing to see each other’s point of view.

The process of developing the rubrics, and carrying out assessment was time-consuming, but the course team agreed it was worthwhile in order to ensure integration across the three subject areas. The process also meant that the three members of the team gained an in-depth understanding of each other’s subjects and the contribution they could make to addressing sustainability issues. Fully integrating assessment practices in this way offered insights into the alignments between course readings, lecture materials and grading practices in the different disciplines. Sharing assessment in this way does raise the issue of the stability of the teaching team. Having invested time into developing the course and understanding how other disciplines can contribute to sustainability issues, it would be reassuring to know that the same team could teach several cycles of the course. However, this would require the agreement of the different Heads of Schools who allocate teaching and are likely to prioritize teaching in their own school over a faculty level course.
Student Outcomes

One issue with interdisciplinary teaching is that students can experience cognitive dissonance. While some students are very open to other disciplines others are reluctant to step outside their comfort zones and can become confused. This means effort needs to be made to engage these students (Feng 2012). Mixing students from different subject areas and different years can also cause tensions (Coops et al. 2015). Although involving only 26 students - expectable for a first-time delivery - the course was a very successful pilot with most students seriously engaged and eager to ‘join the dots’ between disciplines in meeting sustainability issues. Some students were more into policy and others into marketing. Throughout the trimester some students appeared to be drifting towards a monodisciplinary approach. It was an ongoing process for us to guide students in a personalized way. More specialized tutorials to provide additional guidance on what interdisciplinary assignments – and real-life programmes – would look like would be a helpful addition to the course.

The pass grade was consistent with other 200-level courses and the A-range students showed exemplary approaches to interdisciplinarity in dealing with the plastic packaging problem. We were pleased to get these results without prerequisites in an interdisciplinary course. We emphasized that we needed creative thinking across disciplines to meet the challenges of sustainability. Many sustainability challenges are novel, and we don’t have textbooks for all – we need students to chip in with their fresh thinking and enthusiasm. We designed the course so that we can maximize on student opportunities for creative thinking.

Conclusion

This paper aimed to address both the benefits and challenges of using the interdisciplinary approach to teach sustainability. In higher education students are typically educated using a monodisciplinary approach which does not prepare them to address complex real-world issues. Our course aimed to encourage students to take a broader and much longer-term view of sustainability, and to seek solutions to wicked problems. The longer-term sustainability solutions may not be win-win, there may be win-lose solutions needed, and those meaningful solutions will be interdisciplinary.

Information systems as a subject area has the potential to make a vital contribution towards the UN’s Sustainable Development Goals and significant research has already been carried out in the areas of energy reduction, building management, teleworking and digital recycling. However, there are limits to the issues that can be tackled by one discipline alone – the sustainability issues that need to be addressed call for expertise in numerous areas. By working collaboratively with colleagues from different disciplines information systems academics and their students can tackle a much wider range of issues. They can also demonstrate how technological solutions can be operationalized by government policy and gain widespread public acceptance, even public demands for action, using social marketing. This case study has demonstrated the benefits of working together with scholars in the fields of public policy and marketing however the potential for collaboration is obviously much wider than this and information systems would integrate well with disciplines in the areas of science, engineering, law, design and business.

Despite the obvious benefits of the interdisciplinary approach, there are challenges. While sustainability teaching is encouraged within Victoria University of Wellington, enthusiasm at the chalk face is only very slowly changing the siloed structure of the institution. There are many positives: widespread enthusiasm from staff; strategic support from top management and demand from students, yet there are still substantial challenges with establishing fully interdisciplinary courses in sustainability. The major barriers are the siloed nature of university processes and the bureaucracy and time required to set up new programmes. While many sustainability courses are on offer at the university they are taught within a particular discipline. To fully address the issues raised by sustainability, an interdisciplinary approach and new skills are required.

Establishing and presenting an interdisciplinary course necessitates staff to go above and beyond usual requirements, including the need for understanding each other’s subject areas, and being able to accept criticism of their area of expertise from non-subject specialists. Teachers cannot expect students educated in a monodisciplinary system to develop skills in interdisciplinary thinking overnight, this needs to be inculcated gradually by building up interdisciplinarity expectations throughout the course, culminating
Why Information Systems Should Adopt an Interdisciplinary Approach

with the final assessment. Because of these issues, setting and marking integrated assignments takes substantially more time for academics than remaining within their own subject area silo.

Despite this, helping to educate future leaders in how to solve wicked problems that cover multiple disciplines should be a core requirement of universities. The development of such courses should not rely on the enthusiasm of a few dedicated staff. The extra effort involved needs to be recognized by the institution and funded accordingly. This is a challenge in the time of a global pandemic when all universities have reduced funding, but tackling climate change through broad, interdisciplinary approaches, is imperative if we are going to leave a world worth living in for the next generation.

References


### Appendix A: Assessment Rubric for Sustainability Plan Assignment

<table>
<thead>
<tr>
<th>Policy recommendations (max 20%)</th>
<th>Excellent</th>
<th>Very Good</th>
<th>Good</th>
<th>Unsatisfactory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likely very effective policy instruments, all well targeted at the</td>
<td>Recommendations likely to be quite effective in relation to the targeted</td>
<td>Some question marks on the prospects for recommendations to work well in</td>
<td>Suggested policy interventions lack credibility that they may support</td>
<td></td>
</tr>
<tr>
<td>right actors; very suitable for the policy objective. The referred</td>
<td>actors and quite aligned with the policy objective. Preferred instruments</td>
<td>relation to targeted group actors and/or the policy objective. Unlike</td>
<td>the given policy objective and do not work well together. Most</td>
<td></td>
</tr>
<tr>
<td>policy instruments present a strongly coherent policy package</td>
<td>likely to complement each other well.</td>
<td>that the preferred policy instruments will form a coherent policy</td>
<td>instruments are not suitable for the target groups suggested.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>package</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business interventions (max 20%)</td>
<td>Thorough, systematic, and accurate selection of material, leading to</td>
<td>Uses largely adequate material and provides credible and well justified</td>
<td>Token or no critical assessment, with significant omissions and/or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>compelling business interventions; these are very well aligned with the</td>
<td>business interventions in the context of the preferred policy interventions.</td>
<td>inaccuracies in selected material. Arguments are incomplete, inaccurate,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>preferred policy interventions discussed.</td>
<td></td>
<td>distorted or misused. Business plans do not align with actions</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>expected under the preferred policy instruments.</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information Systems and Technologies (max 25%)</td>
<td>Outstanding solutions that flow logically from analysis and argument for</td>
<td>Appropriate solutions that flow logically from argument and analysis</td>
<td>Solutions are poorly defined, illogical, inappropriate or misaligned</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a ‘must do’ completion within time horizon. Remarkably suitable as</td>
<td>for effective and efficient completion within time horizon. Persuasively</td>
<td>with analysis, or not achievable. Little or no application of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>implementation or monitoring mechanisms for policy and business level</td>
<td>argued alignments with earlier discussed policy and business level</td>
<td>information management concepts or weakly argued with limited or no</td>
<td></td>
</tr>
<tr>
<td></td>
<td>interventions</td>
<td>interventions.</td>
<td>recognition of impacts. Ideas are disconnected from policy and</td>
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## Why Information Systems Should Adopt an Interdisciplinary Approach

<table>
<thead>
<tr>
<th>Integrated Marketing Communications Plan (max 25%)</th>
<th>Professional Communication (max 10%)</th>
<th>business interventions.</th>
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</thead>
<tbody>
<tr>
<td>Provides fresh marketing insights and compelling arguments to clearly identify and prioritize key issues. Outstanding planning incorporating goals, priorities, strategies, resources and timeframes. Ideas strongly connected to the other three perspectives discussed.</td>
<td>Professionally presented business report, compelling, well written; no/few errors. Clear structuring in sections and subsections. Straight to the point. Respecting all referencing criteria and adequate paraphrasing.</td>
<td>Solutions poorly orchestrated, illogical or inappropriate, with little or no prioritization, poor strategic or other elements. Little or no application of marketing concepts or weakly argued. Ideas are hardly, if at all connected to the other three perspectives discussed. Perspectives are fragmented and to not offer a trustworthy implementation plan.</td>
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<tr>
<td>Uses good marketing insights and arguments to prioritize key issues. Sound planning with clearly identified goals and priorities, strategies, resources and timeframes. Ideas have important complementarities relative to the other three perspectives discussed.</td>
<td>Well-presented report with only minor issues in layout/spelling/grammar or illustrative material. Clear structuring in sections and subsections. Bit of an edit needed before it goes out. Respecting all referencing criteria and adequate paraphrasing.</td>
<td>Adequately written; problems in layout, clarity, spelling/grammar. Limited structuring in sections and subsections. Professionally acceptable only as a draft with a rewrite and another review needed. Reasonable application of referencing criteria and adequate paraphrasing.</td>
</tr>
<tr>
<td>Some sensible marketing planning with some goals and priorities but weak strategies, or other elements. Ideas are only partly connected to the other three perspectives discussed and relationships are incompletely argued.</td>
<td>Adequately written; problems in layout, clarity, spelling/grammar. Limited structuring in sections and subsections. Professionally acceptable only as a draft with a rewrite and another review needed. Reasonable application of referencing criteria and adequate paraphrasing.</td>
<td>Inadequately written, disorganized or ambiguous elements. Layout clarity, spelling and/or grammar below standard. Hardly any structuring visible. Needs significant rework to reach a professional. Incomplete references / plagiarism identified.</td>
</tr>
</tbody>
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