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Team-Teaching in a Matrix Style: Addressing wicked-problems of MNEs in the context of sustainability

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Abstract

While developing a new module on applied sustainability at a German University of Applied Sciences, in the study program Bachelor International Business as an elective, our planning was interrupted by the pandemic and we took this as a chance to adapt our teaching approach accorcingly. As sustainability management is a complex and multidimensional field we decided to implement a virtual team teaching approach, with three lecturers bringing in distinct knowledge. We developed a matrix team structure across students and lecturers. The aim of our approach was to equip students with knowledge from different sub-disciplines related to sustainability and to foster problem-solving competencies through both a team-oriented assignment and team-teaching. We demonstrate our approach and students' evaluation on it. We show that working in a matrix is a challenge for some students, which encourages us to continue with this approach in order to foster students employability.

Keywords: *team-teaching; inverted classroom, sustainability; bachelor level.*

1. Introduction

While developing a new module on applied sustainability at a German University of Applied Sciences, our planning was interrupted by the pandemic-induced move from in-class teaching to distance learning at German higher education institutes. We took this as a chance and adapted our teaching approach from scratch. As sustainability management is a complex and multidimensional field addressing so-called wicked-problems (van Tulder, 2018) we decided to implement a virtual team-teaching approach, with three lecturers that bring in distinct knowledge and topics. We developed a matrix team structure across students and lecturers, which we want to present in the following. Students worked in teams and had the task to plan a sustainability-oriented approach to a market entry for an exemplary large Multinational Enterprise (MNE) into a market in the global south. Each team member had a different focus area to address, while at the end, all individual components were to to be combined to a larger and concise strategy. The aim of our approach was to equip students with knowledge from different sub-disciplines related to sustainability and to foster problem-solving competencies through not only a team-oriented task/assignment but also team-teaching.

We demonstrate our teaching approach and the related literature in the following. Afterwards we use student evaluations to discuss whether our teaching experiment is suitable to tackle the identified challenges.

2. Team-teaching in a matrix structure

When designing our course on applied sustainability at a German University of Applied Sciences, we were confronted with several challenges. The course is planned as an elective course in the 4th or 5th semester of a 7-semester (210 ECTS) English speaking bachelor program on International Business. The course is planned with 5 ECTS and 180min classes per week. The students had no previous knowledge on the topic from their so far completed modules. The challenges can be grouped into three main dimensions:

1. Sustainability management is a complex, multidimensional field that needs interdisciplinary input.
2. Our module should represent the complexity of decisions a sustainability manager faces to increase employability of our students (Dacre Pool & Sewell, 2007).
3. The pandemic increased uncertainties, especially in the planning phase, on whether teaching would be on campus or digital or hybrid (Zawacki-Richter, 2020).

The first challenge let us to try out a team-teaching approach, as team-teaching contributes to an improved teaching strategy planning (Marzocchi, Druken, & Brye, 2021), motivation and skill learning among students (Minett-Smith & Davis, 2020; Vesikivi, Lakkala, Holvikivi, & Muukkonen, 2019). Two of us had first experience in co-teaching

(Wohlgemuth, Saulich, & Lehmann, 2019), but none of us had experience with a full team-teaching approach, especially as our administrative procedures disincentives team-teaching (Wohlgemuth, Lehmann, & Ammeraal, 2020). Each of us would get only a third of the course accredited in her teaching hours, hence, all hours spent jointly in class would be unaccredited teaching obligation for us. Hence, most input sessions were designed as a 'parallel model' form of team-teaching, where "each member teaches only those sessions assigned to them due to expertise or availability" (Minett-Smith & Davis, 2020).

Following recent developments in the sustainability teaching field (Carey, Beitelspacher, Tosti-Kharas, & Swanson, 2021; Keeley & Benton-Short, 2020), we decided to form a team of three lecturers with distinct expertise. One of us is an expert in sustainability management and sustainable supply chain management, one is an expert on environmental and energy policies, and the third one on sustainable development and development cooperation. Although most sessions were held by only one professor, the introductory session and the sessions at the end of the semester, when students presented the results of their assignments, were spend jointly, stressing an 'interactive' and interdisciplinary approach (Minett-Smith & Davis, 2020).

The second challenge let us to a matrix structure. A matrix organization structure is common organizational form in business organizations. As flexibility and projects play a larger role in highly volatile environments, more and more organizations reform their organizational structures into a matrix structure (Burton, Obel, & Håkonsson, 2015). Simplified, a matrix structure is two dimensional, and in many organizations cross-functional. This reduces line-thinking and increases cooperation and communication between functional departments (Joyce, 1986; Kolodny, 1979). We figured that the matrix structure would first contribute to our goal of increased employability, as it models the common structure in many organizations and provides the potential to model the complexity of the field. At the same time, it seemed an interesting way to structure our team-teaching as well as the assignment the students had to complete. This means, not just the teaching team was split in the three areas of expertise but also the student groups. Hence, students formed groups of three and had the task to plan a sustainability-oriented approach to a market entry for an exemplary large Multinational Enterprise into a market in the global south. In each student team, one student was responsible for deriving insights on how this corporate task relates to the existing sustainability strategy for the MNE, one was responsible to analyse sustainability-oriented policies that would influence the market entry (e.g. GHG reduction targets, etc.), and one was responsible to look at specificities of the target market and identify potential stakeholders in the field of development cooperation. Each student group dealt with a different case. Each group addressed all three aspects and they were asked to provide a joint presentation at the end of the semester. In addition, each student submitted a short written summary on their respective

findings. Table one demonstrates our structure, which we have not seen in any other teaching approach discussion.

Table 1. Matrix teaching structure.

	Group A (Case A)	Group B (Case B)	Group C (Case C)
Lecturer 1 (Topic 1)	Student A1	Student B1	Student C1
Lecturer 2 (Topic 2)	Student A2	Student B2	Student C2
Lecturer 3 (Topic 3)	Student A3	Student B3	Student C3

Source: Authors own.

To cope with the third challenge, we conceptualized the course as an online course, based on an inverted classroom approach, which has been demonstrated to produce intensified and active learning (Foster & Stagl, 2018; O'Flaherty & Phillips, 2015). This implied that for each week, students received literature, videos, or interactive presentations as asynchronous teaching material a week before class and had the task to work through this material to prepare for the next live online class. In the online class meetings, we asked students to participate actively and with cameras on. The focus was on conducting exercises which reflected the previously consulted material.

We followed the approach of parallel team-teaching based on the inverted classroom approach for two-thirds of the semester. The last weeks of the semester were spent in individual consultancy sessions. Hence, each lecturer would have a consultancy session with her students (i.e. referring to table one, Lecturer 1 would meet with Student A1, Student A2, and Student A3). This way, all students focusing on the same field but different cases could also exchange their knowledge and the lecturer could work on the specificities of the topic in preparation of their respective assignment tasks.

The student teams had two exam components. They had to hold a joint presentation combining all three areas to present a stringent market entry plan. Additionally, each student had to prepare a hand-out with details on the strategy reflecting on the specific topic they had chosen.

3. Evaluation

Even though the class was small (n=9), we conducted a detailed evaluation of the module. We decided to provide an anonymous feedback option via an online collaboration tool during

a specific dedicated time in the last session of the semester. We asked students to answer four standard evaluation question on a five point Likert scale, afterwards we asked for open text feedback on the three above identified issues: team-teaching, matrix structure, online inverted classroom. Students were incentivized to participate in this session as they received their grade and initial feedback by the lecturers at the end of that session.

The students rated the course as generally good. Especially the teaching concept and the structure were rated as "good" by five to six participants of the evaluation (n=9), but by none as very good. The lecture support was considered "good" or "very good" by five out of nine participants. However, the rest of the students were less satisfied. If this was related to a specific lecturer, remains unclear.

Concerning the team-teaching approach, the student feedback was generally positive. Most students valued the different perspectives, which is in line with previous research (Minett-Smith & Davis, 2020; Vesikivi et al., 2019), as the following statement represents:

"Positive are the different perspectives and more expertise on a topic provided by several lecturers. Also maybe some people feel more comfortable with certain lectures so that can be a benefit."

Even though almost all comments stated an appreciation of the team-teaching approach, several statements also pointed to a lack of cooperation between us lecturers as the following statement exemplifies: "*I really enjoyed having different perspectives. Although I think that there could me more building the expertise with each other.*" In line with Keeley and Benton-Short (2020), we conclude that a lead-lecturer is indispensable.

Concerning the matrix structure in our team and assignment, the opinions were mixed. Some students appreciated a new approach: "*it is refreshing and something new*";

"It was clear, once I knew the topics I'm writing about I knew to which professor I should talk to."

However, several student were rather lost and confused by it:

"I think the matrix structure with the different topic led to the task being quite unclear. My team members and I were really not sure what to include in the handout and how much overlap in content there was allowed."

"It was clear, but I don't know if it was helpful, because the individual tasks were pretty different but at the same time it also had to follow a red line"

"I liked that it was divided for us, compared to other projects that are done in groups, so it kind of took away the first step of the group work. Timing wise, the fact that the third person had to wait for the inputs of the other students slowed down the process."

These statements showed us, that we do not only need to intensify our within-teaching-team cooperation, but also need to work on communicating our expectations on the assignments more clearly. However, some students seemed overburdened with a matrix structure and the communication needs entailed. We found this to be an alarming sign, considering that matrix structures are a common organizational structure (Burton et al., 2015).

Concerning our online inverted classroom approach, the feedback of the students was as divided as in most of our classes currently and as others have demonstrated before (Ryan, Hodson-Carlton, & Ali, 2005). About half of the class appreciates the flexibility and learning style of an online course setting, while the other half would have preferred on-campus classes and assumed that there would have been more intense discussions in an on-campus setting.

In addition, we self-reflected on the module. We concluded that we need to be more specific when it comes to describing the assignment. Although we initially believed that providing a certain degree of "freedom" for the students on how to solve the assignment and to derive solutions for the task assigned is beneficial to solving wicked problems (von Tulder, 2018), it occurred that this may be overburdening students at the Bachelor level. On the positive side, we saw cross-disciplinary solutions within the different sub-categories by the students, which supports our idea of inter- and transdisciplinary teaching and the development of the respective competencies and is in line with previous research in team-teaching in sustainability (Carey et al., 2021; Keeley & Benton-Short, 2020).

4. Conclusion

The feedback received, even though the class was small with only 9 actively participating students, was evaluated rather as encouraging to teach the module again in the upcoming semesters. We see a need to adapt our approach and to refine our requirements, and potentially we need to provide more time during class-time for the different groups to work on their assignment. We observed that the participating students developed cross-disciplinary ideas to solve the provided task during their assignment. The notion of the role-play included in the assignment would also need to be strengthened in the next round of this module, as we feel that the students did not see themselves as being "inside" a business were this task was given to their team to solve in a given amount of time.

Despite the positive feedback and our own increased motivation to team-teach, we would feel more encouraged to try innovative forms of co-teaching if such approaches would be better-reflected in the administrative processes, as others have discussed before us (Härkki, et al., 2021; Ryan et al., 2005; Wohlgemuth et al., 2020).

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