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THE EFFECTIVE USE OF RRI TEACHING METHODS ON A CSR COURSE

AZ RRI OKTATÁSI MÓDSZEREK HATÉKONY ALKALMAZÁSA EGY CSR-KURZUS SORÁN

Teaching with RRI methods makes a difference. This paper aims to evaluate the application of RRI tools in a CSR course. A course is considered effective when objectives, targeted skills, competences, and expected learning outcomes are communicated and reached. The focus of this research is understanding the impact of a specific international blocked course on the social and environmental sensitivity of students through the application of a mixed-method approach. Q-methodology was used to measure the preferences of students before and after the course regarding their individual behaviour and expectations towards companies. Interviews were conducted after the course to assess individual perceptions about the course and its teaching methods. Results suggest that the RRI approach in teaching is clearly appreciated by students, and its effectiveness is estimated as high. Changes in responsibility-related preference order reflect stronger and weaker impacts alike, helping identify effective RRI tools for teaching, as well as opportunities for further improvement.

Keywords: **RRI teaching, measuring effectiveness, responsibility, CSR, Q-methodology**

Az RRI-módszerekkel történő oktatás mérhető magatartásformáló hatással jár. A cikk célja az RRI-eszközök alkalmazásának értékelése egy CSR-kurzus esetében. Egy kurzus akkor tekinthető eredményesnek, ha az oktatás során sikerül a kurzus céljait, a megcélzott képességek és kompetenciák fejlesztését, az elvárt tanulási eredményeket elérni. A tanulmány kevert módszertan alkalmazásával elemzi egy blokkosított nemzetközi kurzus hatását a hallgatók társadalmi és környezeti érzékenységére nézve. A kutatás során először Q-módszer alkalmazásával mérték fel a szerzők a hallgatók preferenciáit, a kurzus előtt és után. A kurzus végén emellett félig strukturált mélyinterjúkat készítettek az egyéni észlelések és a tanítási módszerekkel kapcsolatos vélemények, benyomások értékelése céljából. Az eredmények szerint a hallgatók nagyra értékelik és eredményesnek tartják az RRI-eszközök alkalmazását az oktatásban. Felelősségvállalással kapcsolatos preferencia-sorrendjükben a kurzus hatására bekövetkező változások erősebb és gyengébb hatásokat egyaránt tükröznek. Ezek elemzése segít azonosítani az oktatásban eredményesnek bizonyuló RRI-eszközöket, valamint rámutat a további fejlesztési lehetőségekre.

Kulcsszavak: **RRI-oktatás, hatékonyság mérése, felelősségvállalás, vállalatok társadalmi felelősségvállalása (CSR), Q-módszer**

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The paper uses the conceptual framework of Responsible Research and Innovation (RRI), and investigates its application in higher education – more specifically, in an international blocked course entitled "Corporate Sustainability and CSR". According to the definition of von Schomberg (2011, p. 9), RRI is "a transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view to the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products (in

order to allow a proper embedding of scientific and technological advances in our society)".

Based on this comprehensive definition, Tassone, O'Mahony, McKenna, Eppink & Wals (2018, p. 344-345) suggest three educational design principles for RRI in higher education: education for society, education with society, and educating whole persons. In line with the Lund Declaration (2015), the main goal of the course we analyse here was to address societal challenges and provide students with a set of solutions that can be effectively used for the benefit of society. Teaching methods were selected to relate to cognitive, affective, and conative behaviour patterns for the sake of educating whole persons. This specific course did not include collaboration with external stakeholders; it focused on the first and third principles of Tassone et al. (2018). Also, the course did not aim to address skills related to the relationship between research and innovation (R&I) and society.

The paper is based on the logic of designing a course and measuring whether course objectives, targeted skills, and competences, as well as expected learning outcomes, are achieved. According to Blass and Hayward (2015, p. 36), one of the new roles of management education is "to refocus education to ensure that we educate and develop globally responsible leaders". In this process, the knowledge base, focal issues, approaches, as well as teaching methodologies must be reconsidered (see also Thomas & Wilson, 2011). Although quite a number of research studies have been carried out worldwide about how sustainability and CSR have been embedded into the curricula of management education programs (Christensen, Peirce, Hartman, Hoffman & Carrier, 2007; Burguette, Lanero & Licandro, 2013; Teodoreanu, 2014), only a few of them have specifically addressed the effectiveness of teaching about these issues (Luthar & Karri, 2005; Sleeper, Schneider, Weber & Weber, 2006; Kagawa, 2007, Segon & Booth, 2009). Going beyond the assessment of acquired knowledge (see Zsóka, Marjainé Szerényi & Széchy, 2011), measuring the impact of sustainability and CSR-related courses on skills and competencies and affective and conative behaviour patterns can be considered an understudied research area.

Our paper aims to add value by evaluating the impact of a sustainability- and responsibility-oriented course which makes use of several RRI teaching methods, in particular by discussing how the course can evoke changes in the preferences and behaviour of students, and which RRI teaching methods are perceived to be effective at achieving the desired learning outcomes. Two research questions were formulated accordingly, and investigated with mixed methodology. Changes in the preference structure of students concerning corporate and individual responsibility were measured using the Q-method before and after the course, while the perceived impacts of the course and especially the RRI teaching methods on the learning process and learning outcomes were explored using additional semi-structured interviews.

Literature review

Targeted skills and competencies in CSR courses

Several research studies have confirmed that universities play a critical role in influencing students' attitudes and future behaviour (e.g. Kagawa, 2007; Fischer & Bonn, 2011; Doh & Tashman, 2014). In the literature on education the focal area of authors varies – ethics, responsibility, RRI, and sustainability are frequent subjects of study. Obviously, those foci are not independent of each other and result in partly overlapping targeted skills and competencies. According to Rieckmann (2012, p. 128) "competencies may be characterised as individual dispositions to self-organisation which include cognitive, affective, volitional (with deliberate intention) and motivational elements; they are an interplay of knowledge, capacities and skills, motives and affective dispositions".

Luthar and Karri (2005) examined the connection between studying ethics and doing business. Students stated that studying business ethics had an impact on their expectations and perceptions about what the linkage should be between ethical corporate practices and business outcomes. Sleeper et al. (2006) claim that business schools should have CSR topics in their curricula, and that CSR education has a great impact on donating, volunteering, membership in civil organisations, and the opinion of students that business courses need to incorporate reference to social issues. In the research of Segon and Booth (2009), most of the surveyed part-time MBA students on a dedicated CSR course agreed that business ethics should be a fundamental requirement for good business, and half of them identified CSR concepts as an important part of the managerial skill set.

Focusing on responsibility, Blass and Hayward (2015, p. 39-40) identified a skill set of responsible leaders which includes a long-term view, a wise combination of value-based and rational decision making, reflexivity, an innovative mindset, and a visionary outlook. With a strong focus on "doing well by doing good", responsible global leaders must rely on transparency, shared success, international sensitivity, and address both global and local issues.

The RRI competence framework provides a more systematic approach. Bayram-Jacobs (2015, p. 10) argues that "the emerging skills that should be improved in students according to the RRI approach are critical thinking, problem solving, questioning, responsibility and creative thinking" (see also Svanström, Lozano-Garzia & Rowe, 2008). The EnRRICH project determines four dimensions – anticipation, reflexivity, inclusiveness, and responsiveness – for the categorisation and explanation of RRI competencies (Tassone et al., 2018, p. 346-347). Anticipation includes the capability to explore and manage possible futures, future-oriented ethical capabilities, pro-activity in mindset and action, as well as "describing and analysing those intended and potentially unintended impacts that might arise" (Owen, Macnaghten & Stilgoe, 2012, p. 38 in Klaassen et al., 2017). Reflexivity covers the competencies of self-awareness about one's own dispositions, assumptions, norms, and values, situational awareness, social

awareness and empathy, ethical thinking, and disruptive thinking. Inclusiveness involves the competencies of multi-perspective and inter-cultural communication, participatory ability, trans-disciplinary collaboration, as well as openness and transparency. Responsiveness comprises the competencies of navigating complexity and uncertainties, adaptability, and having the agency to initiate or contribute to change. It is value-based (Owen et al., 2012).

Other authors focus on sustainability-related competencies. Rieckmann (2012) argues that there exists no agreement in the literature about the key competencies higher education institutions should develop when focusing on education for sustainability. His research resulted in the identification of twelve important competencies, among which the three highlighted ones are competency for systemic thinking and the handling of complexity, competency for anticipatory thinking, and competency for critical thinking. For our research, some further competencies from the former set are also relevant, including the competency for acting fairly and ecologically, competency for participation, competency for empathy and changing perspective, as well as competency for evaluation (Rieckmann, 2012). Kassel and Rimanoczy (2018) suggest the necessity of developing a complete sustainability mindset, covering the areas of ecoliteracy, systems intelligence, spiritual intelligence, and emotional intelligence.

The above-highlighted skills and competencies are not fully identical but have much in common, and they can be categorised according to which behavioural patterns they strengthen. A longer-term view, anticipatory thinking and a visionary outlook, systemic thinking, critical thinking and questioning, as well as rational decision making are strongly related to cognitive patterns, while competencies such as innovative mindset, creative thinking, social and environmental sensitivity, problem solving, individual responsibility, and reflexivity go beyond cognitive impacts and mobilise affective (sometimes also volitional) behaviour patterns. Further competencies like value-based decision making, competency for acting fairly and ecologically, competency for empathy and changing perspective, a sustainability mindset, as well as inclusiveness and responsiveness, may clearly exert an impact on conative behaviour patterns.

Those competencies are crucial in our research. The course we analysed aimed to highlight the most important issues associated with sustainability and social responsibility by focusing on how those issues are and should be integrated into corporate strategy to contribute to sustainable development. A further aim was to sensitise students towards sustainability and individual responsibility and provide them with various perspectives to shape their thinking and argumentation. The desired learning outcomes were a higher level of understanding regarding the essence and features of sustainable development; identification of the most important motives and influential factors in the CSR activity of companies; becoming familiar with and being able to formulate opinions about concrete, up-to-date examples of company practice; and, – last but not least – learning from critically assessing corporate sustainability reporting. Targeted skills and competencies included system-level thinking and handling the complexity of sustainable development, critical thinking, and questioning, taking a longer-term perspective, social and environmental sensitivity, problem solving, individual responsibility, reflexivity, value-based decision making, acting fairly and ecologically, as well as being empathetic and able to change perspective. Those skills and competencies are necessary for enabling students to evoke changes in their individual lives, the community, and the companies they will work for.

Identifying appropriate RRI teaching methods for achieving the targeted competencies

To develop targeted skills and competencies, a wide range of appropriate teaching methods is required, regarding which the RRI approach represents a useful toolset. To establish a longer-term view, anticipatory thinking, and a visionary outlook, the understanding of interconnections and causal relationships between different processes and phenomena must be fostered (Rieckmann, 2012). Analysing scenarios, tendencies, and projections can be very useful exercises for this purpose.

To support systemic thinking and to help handle the complexity of sustainable development, Lourdel, Gondran, Laforest, Debray & Brodhag (2007) propose the method of the cognitive mapping of student perceptions. This also helps evaluate how deep the understanding of students related to those complex issues is.

According to Morris (2009), for developing skills in critical thinking, questioning, and evaluating, students need to be given the freedom to control their learning. In this process, teachers are expected to function as facilitators who listen, respond, question, and summarise. The learning outcome itself emerges through the active involvement of students who make their own discoveries and reflect, participate in discussions, and work with others. Critical thinking makes it possible to "think outside the box in a way that breaks boundaries" (Neary & Thody, 2009, p. 40).

To develop the skill of reflexivity, reflective classroom practices are necessary, as suggested by Hedberg (2009). To handle the issues of sustainability and responsibility, critical reflection is crucial as it "can challenge embedded assumptions, beliefs and values…When we reflect, we give the learning a space to be processed, understood, and more likely integrated into future thoughts and actions" (Hedberg, 2009, p. 10-11). In addition to teaching methods which strengthen analytical thinking, reflection should be emphasized more than it has been previously. Hedberg (2009, p. 14) describes three types of understanding when it comes to reflective learning: subject matter understanding ("What am I learning about the subject under study?"), personal (self-) understanding ("What am I learning about myself?"), and critical (contextual) understanding ("What are the broader implications of my learning?"). She states that fostering all three types of understanding through teaching encourages the deepest learning, while reflection is most effective if it is undertaken before, during, and after the course.

Addressing social and environmental sensitivity as well as individual responsibility in competence building is an understudied area. Most pieces of research focus on the different manifestations of environmental awareness, ignoring the social aspects, thereby lacking an investigation of the holistic nature of individual responsibility and sensitivity. Beside using teaching methods targeted at individual environmental awareness, focusing more strongly on social sensitisation and personal (self-) understanding (as suggested by Hedberg, 2009) is expected to lead to the more effective development of individual responsibility and sensitivity, which can directly or indirectly result in acting fairly and ecologically. Demonstrating empathy and being able to change perspective can be fostered through multi-perspective discussions, role play, and situations in which expressing and practicing empathy is crucial (as suggested by Paschall & Wüstenhagen, 2012).

The aim of the course was to make use of appropriate RRI teaching methods. The course deeply integrates reflective learning throughout the whole process concerning the three types of understanding (as suggested by Hedberg, 2009): subject matter-, personal (self-)-, and critical (contextual) understanding. The RRI approaches we applied were: ongoing discussions related to every crucial topic, mapping the risks and opportunities of global sustainability and responsible behaviour during group work, reflecting on conflicting issues in the form of team presentations and related conversations, analysing videos and real-life examples and case studies by highlighting and explaining the relevance of various perspectives, as well as the joint formulation of a holistic overview for 'take-away'. Those approaches were aimed at mobilizing and developing the four RRI competencies of Tassone et al. (2018) in students –anticipation, reflexivity, inclusiveness, and responsiveness.

Methodology

Research questions

For the empirical research, two research questions were formulated:

1. How has the course – through its design, content, and teaching methods – changed the preferences of students related to corporate and individual responsibility?
1. How do students perceive and evaluate the RRI teaching methods we applied and the impact they had on them?

Research questions were investigated during a one-week long, elective blocked course called "Corporate Sustainability and CSR", offered by the authors at the University of Passau in June-July 2019 for 28 international master's students – including German, Chinese, Mexican, and Hungarian participants. Students were selected for the course in accordance with their overall study performance in the master's programme and intrinsic motivation, but their background knowledge and attitudes towards environmental sustainability and responsibility were diverse. We used mixed methodology to answer the two research questions.

Applying the Q method to investigate Research Question No. 1

First, we studied the literature to evaluate which research methods would be appropriate for measuring the effectiveness of the course in changing students' preferences in relation to the targeted learning outcomes. Cognitive learning outcomes are usually measured by assignments, exams, tests, and evaluations of student performance (Chirieleison, 2017). Affective learning outcomes are measured by surveying attitudes towards sustainability and/or to the course itself, involving asking about students' personal involvement and the perceived impacts of the course on their attitudes (Adler, 2002; Gioia, 2002; Crane & Matten, 2004; Davies, Edmister, Sullivan & West, 2003; Evans & Marcal, 2005). Conative learning outcomes are difficult to measure, as actual behaviour is a manifestation of several influential phenomena. The impact of a course is rather indirect and may only appear later in time. In the literature, willingness to act, or behavioural patterns of individual responsibility (e.g. sustainable consumer behaviour) are typically surveyed (Kagawa, 2007; Zsóka, Marjainé Szerényi, Széchy & Kocsis, 2013).

To go beyond traditional performance evaluation methods and avoid the biased responses which are frequent in surveys, the Q-method was applied to analyse students' priority orders in terms of cognitive, affective, and conative behavioural patterns related to individual and corporate responsibility and sustainability.

We chose the Q-method because of its advantages and expected suitability for assessing the impact of the course on students' preferences. The method was previously applied by the authors in several areas of sustainability (e.g. Nemcsicsné Zsóka, 2007; Zsóka, Marjainé Szerényi, Ásványi & Flachner, 2011; Ásványi, 2014; Ásványi & Kiss, 2019). The advantage of the method is that it combines qualitative and quantitative elements, which permits the presentation of different opinions, values, preferences, and social viewpoints related to focal issues (Webler, Danielson & Tuler, 2009; Hofmeister-Tóth, 2005). A further advantage of the Q-method is that a smaller sample size (of 12-50 respondents) is sufficient for the analysis. Representativeness is not aimed at – the main aim is to identify different viewpoints and preference structures about a topic (Webler et al., 2009; Watts & Stenner, 2012).

To capture changes in the preference structure of students, the research was conducted both before and after the course. Based on the main objectives and the learning outcomes of the course, 30 statements were formulated for the research, covering the areas of conscious and responsible consumption and consumer expectations towards companies, as defined in a study by Dudás (2011), completed by further statements about corporate responsibility-related issues included in the UN Sustainable Development Goals (Gore, 2015). Taken together, statements covered four types of responsibility (specific statements

are referred to in more detail in the results section of the paper):

- expected responsibility of companies towards their employees,
- expected responsibility of companies towards their consumers,
- individual social responsibility,
- individual environmental responsibility.

Respondents were required to position the 30 statements in a matrix structured according to a forced normal distribution, shown in Table 1. The procedure is based on the pairwise comparison of statements and an assessment of the degree of agreement or disagreement with each statement as compared to other statements. Statements were formulated in either a positive or a negative way to foster the prioritisation process. Data were analysed using the PQmethod 2.35 software (http://schmolck.org/qmethod/downpqwin.htm).

Table 1.

Preference table used in the Q-method

-3 Disagree	-2	-1	0	+1	+2	+3 Agree

Source: authors' construction

Semi-structured interviews for investigating Research Question No. 2

As reflective learning was one of the main objectives of the course, the Q-method was supplemented by semi-structured individual interviews to obtain deeper insight into the achievement of learning outcomes from the perspective of students' opinions (King, 1994). As the goal was to understand individual aspects and to obtain more detailed information, we used semi-structured interviews (Berg-Luna, 2012). Questions were formulated in an open way, and were not directly related to targeted skills and competencies or to specific teaching methods, as we were interested in how students perceive and recognise factors as shaping their behaviour. The questions were the following:

- Which areas of your life were affected by the course?
- How have the course assignments influenced your consumer behaviour?
- How has your environmental awareness changed during the course?
- How has your social awareness changed during the course?

A total of 10 in-depth interviews were conducted after the course, where respondents' identities were anonymized.

Results

Change in priorities and behaviour patterns

Sixteen of the 28 students participated in the research that employed the Q-method, on a voluntary basis. In the first step, principal component analysis was undertaken on the

Table 2.

Rotated factor score matrix in the pre-course and post-course research phase

Preference orders	*Pre-course research*			*Post-course research*		
	Factor 1	Factor 2	Factor 3	Factor 1	Factor 3	Factor 2
FH	**0.5645x**	0.1238	0.0195	**0.6590x**	-0.0016	0.1731
AG	**0.7291x**	-0.2752	0.2730	**0.9088x**	0.0771	0.0045
BP	**0.7201x**	0.1720	0.3412	**0.6635x**	0.1627	0.5219
DM#	0.0171	**0.6172x**	0.0171	0.2230	**0.8016x**	-0.1073
EK	**0.6151x**	0.3878	0.0538	**0.6879x**	0.1979	-0.0165
JH	**0.6770x**	0.2894	0.1845	**0.6014x**	0.2682	0.0520
KP	**0.8180x**	-0.0731	0.0171	**0.8240x**	0.1507	0.1242
LM#	-0.2376	0.5805	**0.6081x**	-0.0280	-0.1607	**0.8118x**
MS	**0.7983x**	0.2274	-0.102	**0.6906x**	0.2248	0.3509
MG#	0.1449	0.1143	**0.7939x**	**0.6355x**	0.1275	0.2202
GM	0.2275	**0.7671x**	0.1224	0.2174	0.3423	**0.6694x**
MK	**0.5116x**	-0.1142	0.4915	**0.7207x**	.3215	-0.0557
NM#	0.2477	0.2394	**0.7693x**	**0.5317x**	0.1740	0.4802
PL#	0.1903	**0.6552x**	0.1947	0.0614	**0.7990x**	0.2499
JW	**0.5393x**	0.0826	0.3075	**0.7625x**	-0.0686	0.1206
SR	**0.5928x**	0.4324	0.1531	**0.7439x**	0.1126	0.2253
% expl. Var.	**29**	**15**	**14**	**38**	**11**	**12**
Members	**10**	**3**	**3**	**12**	**2**	**2**

Comment: # symbolizes those students whose preference structure changed the most and who were later sorted into another Factor, pre-course Factor 2 transferred to post-course Factor 3, ** Mixed factor*

Source: authors' construction

data, which yielded a total of eight factors. The final number of factors was determined by the eigenvalue of factors (above 1) and explained variance (around 60% or higher). Correlation between factors was also tested so as to be low enough (below 0.4) and each factor had to contain at least two priority structures. Factors also had to be meaningful and significant (Watts & Stenner, 2012).

Varimax rotation was performed for different factor solutions. In the four-factor solution, factors were too similar to each other, and three of the four factors included too few members to permit interpretation of the results. In the two-factor solution, the explained variance did not reach the critical minimum. Hence, both solutions were rejected. The three-factor solution met all preconditions (eigenvalue above 1; explained variance: 58%) and proved easier to interpret. Correlation between factors was less than 0.4 and all respondents' preference orders could be automatically assigned to the factors. Since the comparability of pre-course and post-course priority structures was important, the same number of factors was determined for each research phase. Table 2 shows the rotated factor score matrix for both phases, and also indicates changes in the allocation of preference structures to the factors.

The ten preference orders of pre-course Factor 1 belong to post-course Factor 1 (seven of them with even higher Z-scores), which shows a clearer structure of preferences. Two respondents (MG and NM) changed their preferences the most as their preference orders moved from Factor 3 to Factor 1. The composition of pre-course and post-course Factor 3 is completely different, as the preference orders of DM and PL moved from Factor 2 and became part of Factor 3. GM's preference order stayed in Factor 2 and that of LM moved to the latter from Factor 3, but post-course Factor 2 has significantly different characteristics to pre-course Factor 2.

Pre-course and post-course research results will be interpreted separately, according to the key patterns of the factors which represent 'typical' preference structures of the four types of responsibilities within the sample. Factors will be first characterised according to the statements which received the highest positive or negative Z-score above 1 or below -1 –representing a strong positive or negative position in the preference order. Post-course results will be analysed in accordance with the changes in factor characteristics, distinguishing statements, and consensus statements, and common features of all preference structures will be further analysed to clarify the main impacts of the course on students' preferences.

Pre-course findings identified by the Q-method

We call Factor 1 *responsibility oriented,* as member preference structures express strong expectations about corporate responsibility towards respondents in the roles of both employees and consumers, as well as reflect a desire for strong individual social and environmental responsibility in private action. Factor 2 is entitled *socially and environmentally inconsistent* as the preference structures therein show combined features of preferred and neglected responsible activities. The preference structures of Factor 3 suggest clearly *individualistic* behaviour patterns.

All factors involve expectations about how companies should treat their *employees.* Factor 1 stresses strong expectations about corporate responsibility in relation to general, family-friendly workplace and healthcare measures. Students associated with this factor strongly reject tobacco companies as future workplace. In contrast, students sorted into Factor 2 do not insist on family-friendly operations, while students contained in Factor 3 would not reject working for a tobacco company.

As *consumers,* the preference structures of members of Factor 1 favour recycled, environmentally friendly, fair-trade and cruelty-free products, which reflects a high level of individual awareness as responsible consumers, and expectations that companies should provide such products. The consumer behaviour and expectations of members of Factors 2 and 3 are inconsistent. The environmental impact of products is less important for those in Factor 2, while individuals in Factor 3 would not reject making purchases from unethical companies and choose environmentally friendly and socially responsible products quite selectively.

Social responsibility in relation to individual activity (in the form of volunteering and acting for the community) is only important for students who make up Factor 1. They would have no problem working with disabled colleagues, and they report to being honest in situations which they could in theory utilise for their own benefit at the expense of others. There are significant differences in *environmental responsibility*, as students classified into Factors 1 and 3 do not turn off electric devices, while those in Factor 2 do not separate waste, and members of Factor 3 are ready to take their own shopping bag.

Post-course findings identified by the Q-method

Post-course findings are interpreted according to the changes which are witnessed in the structure and features of factors so as to explore the impact of the course in terms of shaping the preferences of students for types of individual and corporate responsibility. As illustrated in Table 3, changes in the relative positions of statements in the preference structures of factors can be detected for every type of responsibility, but in a diverse way, which makes detailed explanation necessary.

Due to the changing preferences, Factor 1 can be classified as *responsibility-driven*, Factor 2 shows *inconsistent* patterns but *conscious consumer expectations*, while Factor 3 includes *socially and environmentally more sensitive* preference structures, although in an *inconsistent* manner. After the course, all responding students were *less* likely to reject becoming an *employee* of a tobacco company. This might be surprising, but there are many reasons for this. One is the discussion of employee-oriented CSR initiatives in different industries – where "irresponsible" economic sectors such as the tobacco industry perform relatively strongly due to the need to maintain employee satisfaction and retention. Another reason is that in reflecting on the many serious social and environmental issues

Table 3.

Changing preferences as a result of the course

	Post-course research		
	Factor 1	*Factor 2*	*Factor 3*
Expectation of responsibility of companies towards their employees	• Reject working for a tobacco company ↓ • **Lifelong learning ↑**	• Reject working for a tobacco company ↓ • Family-friendly workplace ↓	• Reject working for a tobacco company ↓ • **Family-friendly workplace ↑** • Care about employees' health ↓
Expectation of responsibility of companies towards their consumers	• **Environmental impact of products ↑** • **Pay attention to product labels ↑**	• **Fair trade and cruelty free products ↑** • **Pay attention to product labels ↑** • **Domestic/German products ↑**	• **Fair trade and cruelty free products ↑** • Pay attention to product labels ↓
Individual social responsibility	• **Donate ↑** • **Act for the community ↑** • **Work together with a disabled employee ↑**	• **Donate ↑** • **Act for the community ↑** • Prefer volunteering ↓ • Trust in civil sector ↓	• **Donate ↑** • **Like volunteering ↑** • **Be honest ↑** • Work together with a disabled employee ↓
Individual environmental responsibility	• **Turn off electronic devices ↑**	• Turn off electronic devices ↓ • Impulse buy ↓ • Take own shopping bag ↓ • **Collect waste selectively ↑**	• Turn off electronic devices ↓ • **Carry own shopping bag ↑**

Symbols: ↑ and italics symbolise strengthening preference, ↓ symbolises weakening preference
Source: authors' construction

during the course, the relative importance of the issues increased, restructuring the overall order of preferences. Depending on the factor membership, the relative importance of further employee-related CSR initiatives such as supporting lifelong learning, being a family-friendly workplace, caring about trainees or the health of employees was diverse. As *consumers*, the preference structures of Factor 1 and Factor 2 show stronger expectations in several areas than before the course, including for product labelling and responsible products. Factor 3 is obviously inconsistent in terms of consumer behaviour-related preferences. As *individuals*, students became more positive about donating (in all factors) and acting for the community (Factors 1 and 2). The strong focus of the course on sensitising students and increasing their individual social and environmental responsibility is the reason for those phenomena. However, there are some features for which the relative change in preferences is ambiguous when comparing pre-course and post-course factors, revealing areas where the impact of the course seemed to be weaker, thus an increase in the sophistication of the course content and RRI tools in teaching seems necessary. Members of Factor 2 ranked trust in the civil sector and volunteering relatively lower in the preference order, and the same is true for Factor 3 in terms of the acceptance of working with disabled colleagues. With regard to other behavioural patterns, the preference structures of Factor 3 appear to be socially more responsible. Regarding individual environmental responsibility, some behavioural patterns climbed, and others declined in importance in the preference orders of the three factors, making further clarification of environmental issues in the course and further education for sustainable and responsible behaviour necessary.

Changes in consensus statements

Table 4 summarises *consensus statements* in pre-course and post-course research phases, indicating changes and revealing some impacts of the course on the shared opinions of students. Three types of consensus statements can be identified within Q-method: significant and non-significant consensus statements based on the factors (both are important in the analysis), and consensus statements based on the similarity of Q-sort values.

As can be seen from Table 4, the course contributed to an increase in *consensus statements*, most of which were ranked higher in the preference order. Some non-significant pre-course consensus statements became significant post-course, and the number of consensus statements based on similar Q-sort values increased.

The course clearly encouraged students to formulate stronger expectations about their future *employer* being a responsible workplace and caring about their health, as well as supporting lifelong learning and trainees. These expectations were found to be the strongest both before and after the course. Expectations about responsible banking practices also strengthened. As *consumers*, there was consensus in both students' social and environmental expectations about companies regarding the types of products they would prefer to buy – including recycled, fair-trade, and domestic products. Since the course mainly focused on corporate sustainability and CSR, the impact on expectations about companies is understandable, while features of individual social and environmental responsibility show less consensus. Trust in the civil sector slightly increased, willingness to act for the community and donate through purchasing were also ranked higher

Table 4.

Consensus statements in the pre-course and post-course research phases

	Pre-course research	*Post-course research*
Expected responsibility of companies towards their employees	• Company respondents work for must be a responsible employer. • **Company respondents work for should care about the health of employees.**	• **Company respondents work for must be a responsible employer.** • Working for a tobacco company is rejected less strongly. • *Lifelong learning and managing trainees in a responsible way is expected from the employer.*
Expected responsibility of companies towards their consumers	• Buying products made from recycled materials is preferred. • Responsible banks are preferred.	• **Buying products made from recycled materials is preferred.** • **Responsible banks are preferred.** • **Buying fair-trade products is preferred.** • **Environmental impact is considered more important than the quality of the product.** • **Buying domestic vegetables is preferred.**
Individual social responsibility	• **Weak trust in civil sector.** • Working together with a disabled employee is accepted.	• **Slight increase in trust in civil sector.** • *Acting more for the community is preferred.* • *Stronger preference for donating through purchasing.*
Individual environmental responsibility	• **No-one considers himself/herself an impulse buyer.** • Indifference to turning off electronic devices.	• **Carrying own shopping bag is preferred.**

Explanation: Bold: significant consensus statements. Regular format: non-significant consensus statements. Italics: consensus statements according to similar Q-sort values

Source: authors' construction

by everyone, and the same is true for some "light-green" behaviours such as carrying a bag for everyday shopping. The course obviously could not evoke a uniform shift in preferences regarding all the pressing issues of individual environmental and social responsibility, but the pattern analysis of the factors highlighted some significant changes in this direction for most participants.

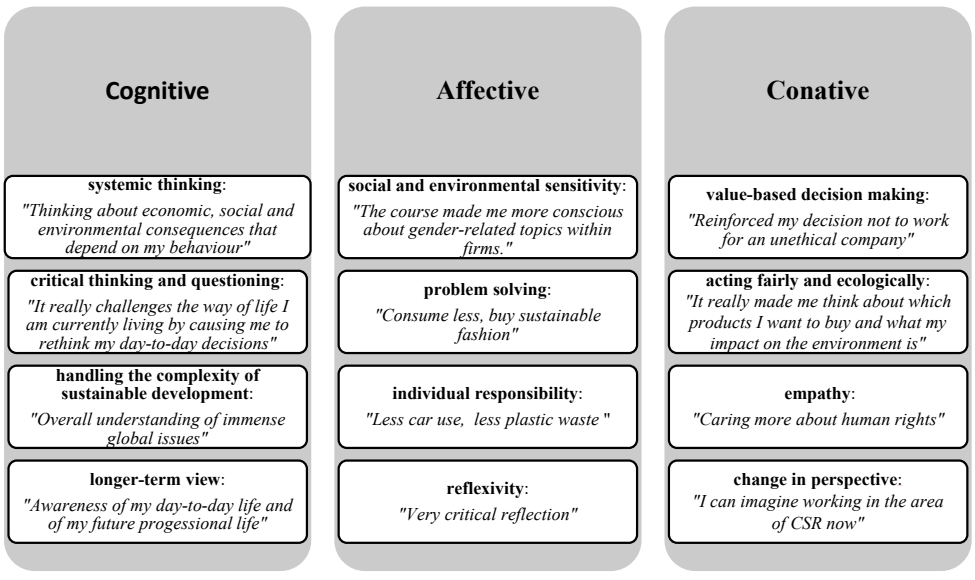
To further evaluate the impact, and especially the effectiveness, of the RRI tools we applied during the course, supplementary semi-structured interviews were conducted, immediately afterwards.

Assessment of RRI tools via semi-structured interviews

The ten individual interviews indicated a very positive overall impression of the course. Respondents strongly appreciated the teaching methods – they highlighted the interactive manner of the course, active involvement of students, discussions in small groups and in the whole class, and the continuous exchange of opinions. They perceived the course as creating an open, democratic atmosphere, where all critical opinions were welcome and appreciated, while the professors reflected on those opinions.

Figure 1.

Recognised targeted skills and competencies according to their behavioural focus



Source: author's construction

The latter feedback was reported to be very important for helping students to psychologically incorporate the new approaches and the discussed perspectives. Case studies and practical examples were considered to be effective starting points for obtaining a holistic overview and integrating sustainability-related issues into the day-to-day lives of individuals.

Beyond highlighting the impactful teaching methods, students also mentioned the importance of the attitude of tutors: "professors seemed to be committed wholeheartedly to the topic". This element is usually neglected by the literature, although it obviously should be given more emphasis, especially in the case of sensitive and complex issues such as sustainability and responsibility. Students' acceptance and integration of the main messages and overall approach are considered to be more successful when the latter experience the personal commitment of teachers towards the topic.

Figure 1 illustrates how the targeted skills and competencies of the course appeared in the answers related to cognitive, affective, and conative behavioural patterns.

Results suggest that all targeted skills and competencies were indirectly recognised and perceived to be strengthened in the cognitive, affective, and conative behavioural dimensions. Among the cognitive patterns, respondents highlighted the systemic and critical thinking they had developed about sustainability and responsibility issues, the "*overall understanding of immense global issues*", and the need to deal with the complexity of sustainable development. They recognised the fact that their behaviour and actions have economic, social, and environmental consequences, so their sense of individual responsibility for the future increased. The course strongly emphasised the long-term view, which factor appeared in reflections related to private day-to-day life and future professional life.

Affective behaviour patterns mainly involved attitudinal change, suggesting an increase in students' social and environmental sensitivity. The latter reported becoming more conscious about gender and human-rights issues. Due to the case studies and discussions, students became more conscious about environmental problems and solutions, which was reflected in their attitudinal change towards car use and plastic waste generation, as well as to everyday life: "*consume less, buy sustainable fashion*". Reflexivity – which was articulated in the discussions and strongly critical reflections about the topics that were addressed – also went beyond cognitive impacts and mobilized affective behavior patterns.

Course objectives targeted at conative behaviour patterns also gained resonance. According to interviewees, the course helped students make value-based decisions – it "*reinforced my decision not to work for an unethical company*". Changes in perspective were also detected: "I *can imagine working in the area of CSR now*". Students reported to have become more empathetic and attentive to human-rights-related issues. The discussion of sustainability issues increased their willingness to act fairly and ecologically: "*It really made me think about which products I want to buy and to think about my impact on the environment*".

Related to the four types of responsibilities, interviews supported the research findings of the Q-method, as students reflected on how the course had impacted their private and work life. After reading and discussing the CSR reports of several companies, students became more conscious and also more critical about what companies do in relation to CSR – *"how firms try to trick consumers with their CSR activities"* – which increased their expectations about companies in terms of transparency and the responsible treatment of employees and consumers. Regarding individual environmental and social responsibility, interviewees reported paying more attention to their impact on the environment: *"After the course I had a closer look in the supermarket at how many alternatives we need to replace plastic."* Social awareness changed mainly in terms of gender-related topics, equal opportunities, and human rights: *"The conditions of employees became a more prevalent part of my thoughts about consumption".* Some students reported to modifying their consumption behaviour by becoming more conscious, thinking more about the environmental impacts of products, and consuming less, especially clothes: *"I am thinking more about whether I really need new clothes."* More students reported changes in work-related attitudes. Beyond a willingness to work in the area of CSR, and to reject companies that behave unethically, we also heard reference to the need for "change agents" (as suggested by Kagawa, 2007) in society: *"The course reinforced my approach to not necessarily work for the most ethical companies, as people with a responsible attitude are especially needed in companies whose behaviour is located somewhere between ethical and unethical"*. This statement provides a further explanation for why some students consider it acceptable to work for a company which is not yet consistently responsible.

The interviews also provided insights into the three types of understanding (as suggested by Hedberg, 2009*).* Students were asked to describe what responsibility means in their opinion, giving us hints about *subject matter understanding.* These interpretations were consistent with the approach of the course.

Personal understanding related to how students connect the learning outcomes to their own individual responsibility and what they apply from the learning outcomes in day-to-day life. In this sense, recognising the consequences of their own behaviour and claiming that responsibility should be taken in relation to the environment and society goes beyond subject matter understanding, and has a strong link to personal understanding. Students mentioned both environmentally and socially responsible activities that they had decided to carry out because of the course, which were in line with the topics discussed therein. However, since the focus of the course was corporate sustainability and responsibility, some students expressed their desire for more information about meaningful ways of changing individual behaviour.

Critical (contextual) understanding refers to the broader implications of learning outcomes, which were

not possible to measure objectively. The interviews served here as an opportunity for self-reflection. Some hints of contextual understanding were expressed in the following statements: "*only the world as a whole can face the issues"* (i.e. the need to involve all stakeholders), and: "*it really challenges the way of life I am currently living by making me rethink my day-to-day decisions*". Respondents recognized that "*all people should be inspired to take responsibility"* and that everybody has to change "*from being indifferent to paying more attention"* to sustainability issues. The course had clearly impacted the critical understanding of students and strengthened their systemic perspective.

As a final note, in line with Zsóka et al. (2013), students stressed the crucial role of education in increasing knowledge about responsibility-related issues: "*a lack of knowledge is most of the time a problem which hinders people from behaving differently"*, as people "*still do not have an overview of how some products actually hurt the environment around them"*, so education could "*help understand the importance of responsibility"*. Beyond increasing knowledge, education can also result in increasing sensitivity: "*young people become aware and will still be aware when some of them become leaders*" – a claim that supports the opinion of Blass and Hayward (2015) that sensitivity is one of the most important skills of responsible global leaders. Students experienced that education "*is the foundation of changing mind-sets in terms of doing something for society and the environment"*, which resonates with the call of Kassel and Rimanoczy (2018) to develop a complete sustainability mind-set within society.

Discussion

Results highlight a clear shift in the responsibility-related preferences of the participating students towards deeper understanding, critical thinking, the expression of stronger expectations about companies as employers and providers of goods and services, and last but not least, towards the better articulation of and higher sensitivity about individual social and environmental responsibility. Students who were already responsibility oriented before the course became more responsibility driven after. Originally environmentally and socially inconsistent students became more sensitive in their individual behaviour, although their preference structure still shows inconsistencies. The factor of individualist students disappeared, while a new factor with conscious consumer expectations emerged. As the course mainly focused on corporate behaviour, an overall increase could be detected in students' expectations that companies should become more responsible in relation to their employees and consumers.

Interview findings indicate the recognition and appreciation of RRI teaching methods, which were perceived very positively, as highly inspiring, eye-opening, and impactful tools which can widen perspectives, provide a good overview and understanding, as well as sensitise the audience in terms of attitudes and behaviour intentions. In addition, the personal commitment and credibility of the teaching staff were also considered to be crucial in transferring the messages and achieving the intended impacts of the course.

As the research results indicate, the RRI approach can be effectively used in teaching to achieve course objectives and learning outcomes, especially when the focus of the course itself is strongly related to responsibility and sustainability. Previous research findings are supported by our empirical research. The aim of applying a mixed method was to address the understudied area of measuring the impact of a course more specifically on soft skills and competencies and the affective and volitional aspects of behaviour, and to show which patterns are easier and which are more difficult to shape via RRI teaching methods. Cognitive aspects are usually measured, and were also measured in this case. The hard skills of students were assessed by evaluating their performance. The initial selection of students for the course – based on their study performance, ambition and intrinsic motivation – generally resulted in sustained, high quality performance. Since participants had more than one month to prepare for the course, including reading compulsory and recommended literature and writing and submitting two individual papers – one on the concepts of value creation, and another on the non-financial reporting practices of a selected company – as well as to compile a group presentation on a specific topic, the course could be considered an advanced one that created a common level of knowledge a priori. Beyond these assignments, individual contributions to discussions were also strongly emphasized in the final evaluation. Each performance unit counted for 25% of the final score and grade.

Cognitive impact was also measured using a "classical" standardised course evaluation form that was implemented at the end of the course, through which students assessed the approach and content of the course, its contribution to students' professional development, the method of teaching, expertise of the tutors, etc. These elements are associated with immediate, short-term impacts, as the indicators mainly focus on cognitive awareness, impressions, and opinions. Comprehensive statistical aggregation of the course evaluation forms supports our research findings, suggesting that the overall objectives of the course and the intended learning outcomes were successfully achieved. RRI-based teaching methods were given very high scores, indicating that students truly appreciated the reflective, communicative, argumentative teaching approach, and how sustainability- and responsibility-related issues were introduced and discussed. The strong focus on developing the skills of critical thinking, as well as contrasting different perspectives in an open, democratic, and reflective way impressed the students and met their expectations regarding the course.

Affective impacts were measured using the two methodologies analysed above, although measuring conative impacts and the explanatory power of the applied research methods is limited. Some volitional aspects and behavioural intentions resulting from the course could be identified and highlighted, but an exploration of actual changes

in behaviour would require longitudinal research as stated preferences (as measured here) and revealed preferences (later action) are not necessarily the same. Similarly, in reality one has to choose from the choice options that are available, if they are not preferred.

Conclusions

The paper describes research aimed at measuring the effectiveness of RRI teaching methods in a course focusing on corporate sustainability and CSR. The Q-method was used to assess changes in the responsibility-related preferences of students, while semi-structured interviews were conducted to evaluate the perceived impacts of the course on students' understanding and the development of their skills and competencies. The use of the Q-method is novel in this area, as it has not yet been used for measuring the impacts and effectiveness of courses before. As the research was carried out before and after the course using the same sample of students, changes in preference structures regarding different types of responsible behaviour could be directly connected with course objectives and targeted learning outcomes. Additional semi-structured interviews further enriched the findings, providing a reflective assessment of the course and the RRI tools applied therein.

The analysed course focused on implementing two of the three design principles for RRI in higher education: 'education for society', and 'educating whole persons', which influenced the scope of effectiveness and the impacts that could be expected from the course. Both the subject matter and critical understanding of students were developed by the course, supporting the principle of education for society, while the impacts of the course on students' personal understanding are closely connected to the principle of educating whole persons. The effectiveness of a course can be further increased by implementing the principle of 'education with society', which enables students to benefit from the concepts of 'learning by doing' and 'doing well by doing good' and strengthening conative behaviour patterns by using approaches that can increase responsibility in real life situations.

In conclusion, the research results show that RRI-based teaching methods can be used effectively, especially when the course itself has a strong focus on responsibility and sustainability. Achieving the intended learning outcomes and developing the desired skills and competencies in all areas of human behaviour makes the application of a wide range of RRI tools necessary, possibly including the implementation of all three design principles for RRI in higher education.

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