

Green Themes in Higher Education The EU, Denmark and CBS

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Green Themes in Higher Education: The EU, Denmark and CBS

-A review of developments

Jens Riemer, Caroline A. Pontoppidan, Lavinia Iosif-Lazar

Introduction

Higher Education Institutions (HEIs) have, during the last two decades, been incorporating sustainability into their systems (Lozano et al., 2022) at varying paces and using numerous methods. Growing efforts to integrate sustainability into education and curricula at HEIs, across disciplines, has been observed in research studies (see for example Karatzoglou, 2013).

Developing sustainability competences across disciplines throughout higher education entails understanding the complexity of this work. Research has echoed that “challenges of urgent and at-scale curriculum renewal are complex and complicated, with a variety of approaches observed in HEIs around the world” (Desha et al., 2009; Lozano et al., 2022).

In **November 2021** the Ministry of Education and Science reached out to HEIs in Denmark to collect information about how Danish HEIs work to integrate green transformation in the educational programmes offered.

The Ministry pointed out that they were aware that HEIs are working to integrate the 17 Sustainable Development Goals (SDGs) and broader sustainability perspectives in the educations. In order to get a comprehensive understanding of the stages of implementation of green transition in higher education, the Ministry asked for a mapping that focused explicitly on the extent of coverage of selected topics (Ministry of Education and Science, 2020) related to **green transition** in higher education.

At CBS, Green Transition has become ***firmly rooted*** in the CBS strategy released in June 2020¹ and the student competency ***framework the NORDIC 9 [N9]***² (see ***Annex 1 for the N9***)

¹ <https://www.cbs.dk/en/about-cbs/strategy>

² See page 9; https://www.cbs.dk/files/cbs.dk/call_to_action/cbs_strategy_0.pdf

CBS has a number of initiatives targeted towards advancing a green transition in education, research and operations. (*note below list is a short extract of initiatives)

CBS' Green Transition. This initiative is established to put the things we talk about in to motion; interdisciplinary cooperation between researchers, students, campus and our local, national and global environment. We work to ensure that the right people are connected, so that both researchers, students and the public at large become a part of the process to reshape our common green future.

³

CBS Sustainability. CBS Sustainability is a multi-disciplinary research centre devoted to the study of sustainable practices and developments in organizations, markets and society at large⁴.

CBS PRME. Principles of Responsible Management Education (PRME) is an offshoot from the United Nations Global Compact's (UNGC) ten principles to encourage businesses to adopt sustainable and social policies. The PRME initiative was a natural next step for the UNGC, supporting its agenda by laying the *foundations for responsible management in business education*⁵.

The purpose of this InFocus report is threefold:

- 1) To provide an overview of activities at EU level and at the Danish level in regards to embedding green themes into educational programmes in higher education.
- 2) To give insights into the pilot methods developed and employed at CBS so as to provide a mapping of implementation of selected green transition topics into our educational programmes.
- 3) To extend the dialogue initiated by the Ministry of Education and Science on Green Themes in higher education and open up for a discussion on the next steps in regards to embedding critical green themes into higher education.

Three levels: The EU, Denmark and CBS

This InFocus report takes an interest in the interdisciplinary advancement of sustainability competences in higher education. More specifically, strengthening students' learning on environmental sustainability is a key policy action area within the European Union, as set out in the

³ See <https://www.cbs.dk/en/knowledge-society/areas/green-transition/green-transition-cbs>

⁴ <https://www.cbs.dk/en/research/departments-and-centres/departments-and-centres/cbs-sustainability>

⁵ https://www.cbs.dk/files/cbs.dk/infocus_1_what_is_prme_5mb_below_file_.pdf

European Green Deal⁶. In Denmark, initiatives are set in motion to support the agenda of the European Green Deal, also in the area of higher education.

THE EU CONTEXT: Higher Education and Green Transition

In the following section there is a focus on the EU's green initiatives in the area of education and training. This means that the presented points are directed towards delivery of education and not towards research activities. This section introduces certain key initiatives that pertain to green education across the EU.

The European Education Area

The European Education Area (EEA) is an initiative that aims for strengthened collaboration between European Union Member States to build more resilient and inclusive education and training systems. The initiative *has five focus topics where one of them is Green Education*.

The initiative originates from the New Strategic Agenda for the EU for 2019-2024 that stresses that Member States “must step up investment in people’s skills and education” which lead to the commissions proposing of a vision for the EEA in 2017 (European Commission 2020, p. 3).

The recent recovery strategies to counter the effects of COVID-19 have, during the last two years, strengthened the focus on an EU collaboration in the area of education and training. This led to the commission reinforcing focus on the area in 2020 by setting up a programme named “Achieving the European Education Area by 2025”.

In 2021, the EU Council put forth a “Council Resolution on a strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021-2030)”. The Councils Resolution strengthens the attention towards green transition by agreeing that “the further development of education and training systems in the Member States are aimed at ensuring: (...) sustainable economic prosperity, the green and digital transition and employability.” (European Council 2021, p.3).

Priority area 5: Supporting the green and digital transitions in and through education and training: Central in the elaboration of priority area 5 is the transformation of individual behavior and skills and the responsibility the education sector has in this regard.

Regarding the organization of the institutions the council resolution states that “education and training institutions need to include the green and digital dimensions in their organizational development.” Furthermore the member states are encouraged to “reorient education and training institutions to a whole-school approach (...) for achieving the needed changes for the green and digital transitions.” (European Council 2021, p.7).

⁶ European Green Deal adopts the UN Agenda 2030 https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

Proposal for a Council Recommendation on Learning for Environmental Sustainability

This proposal was sent to the council on January 14, 2022, and is the most recent high level political communication on environmental sustainability. The core motivation for establishing this recommendation was to highlight that “learning for environmental sustainability is not yet a systemic feature of policy and practice in the EU.” (European Commission 2022, p. 1). It is expected, that the proposal will be adopted by the EU education ministers in the first half of 2022.

The scope of this proposal is in line with the core motivation, it focuses on:

- 1) Highlighting the importance of lifelong learning as a guiding principle for sustainability in education and training.
- 2) Establishing institutional integration and making the institution as a whole direct their activities and operations towards sustainability.
- 3) Securing practice orientation.
- 4) Community building internally and externally.
- 5) Involving the youth
- 6) Building sustainability competences

The EU is only responsible for offering support within the field of education and training. A council recommendation signals the commitment of Member States to the presented material and provides a stronger political basis for cooperation in this area, while fully respecting Member State’s authority in the field of education and training.

GreenComp – The European Sustainability Competence Framework

The Sustainability Competence Framework was developed by the European Commission and was one of the cornerstones in the educational scope of the European Green Deal. It was published in January 2022 and is aimed at providing a shared competence framework on sustainability to guide educators and learners. The Commission encourages Member States to use the framework as a reference when rolling out educational initiatives on sustainability (Bianchi et al. 2022). It has a key focus on life-long learning.

The framework consists of four competence areas that should be acquired by learners:

- 1) **Embodying sustainability values**
- 2) **Embracing complexity in sustainability**
- 3) **Acting for sustainability**
- 4) **Envisioning sustainable futures**

Each subject area (1-4) has three competence sub-parts. The GreenComp framework was published in relation to the proposal for council recommendation.

It is important to note, that at the European policy level, there very rarely a direct appeal to the HEI. Most of the time, the communication is directed towards the whole sector leaving the specific directionality of the initiatives to the Member States. There is a limited amount of direct references to the HEI in the Commission’s Proposal.

- Under recommendations for integrating environmental sustainability across all activities and operations: “Reward HEI through performance-based funding frameworks for effective engagement with sustainability.” Furthermore: “Support HE (...) in the development of small and tailored learning courses on environmental sustainability, leading to micro credentials, in order to deepen, broaden and update professional competences. (EU 2022, p. 13).
- In the final and invitational section of the recommendation: “Monitor the development of green skills by higher education, VET graduates and early career researchers, for example by including these in the European graduate tracking initiatives.” (EU 2022, p.14)

Most of the time HEIs are mentioned together with schools and other training institutions.

In the GreenComp report, the scope is that of defining a competence framework for lifelong learning. Thus, there is no ambition of communicating directly to a specific part of the education sector. The report mentions Higher Education a few times but only to show, that Higher Education has succeeded in creating a focus on competences for environmental sustainability in relation to preparing the students to address sustainability challenges and opportunities in their working life (GreenComp 2022, p.8). Furthermore, the report states that Competences for Environmental Sustainability have, as a research area, mainly been focusing on higher education and specifically on the competences of graduates (ibid).

THE DANISH CONTEXT: The Danish Ministry of Education and the Green Transition

In September 2020, the Ministry of Higher Education and Science, Denmark, published ‘*Green solutions of the Future*’, a strategy for investments in green research, technology, and innovation.

“With a new comprehensive national strategy, the government sets a long-term direction for green research, innovation, development, and demonstration accelerating the development of new green solutions and technology leaps. In a longer-term perspective, this is to reduce the costs associated with the transition and enable concrete reductions by 2030 and 2050. New solutions and technologies play a decisive role in reaching the target of the green transition in Denmark and the rest of the world. Along with this, we will expand the green frontrunner position of Danish industries to the benefit of exports and green jobs in Denmark.” (p.6)

In its publication, the Ministry of Higher Education and Science focuses on the important role of close collaborations between knowledge-institutions and the business community, in order to gear the public research investments with private funds in order that efforts become as powerful as possible. They specifically state that “the interplay and coordination between universities, companies, authorities, and other relevant players must be enhanced to accelerate the development of green solutions and technologies” (p.7).

The publication *Green solutions of the Future* also specifies green missions and initiatives.

Green missions

- Strong Danish commitment in international cooperation on green research
The Paris agreement and the Sustainable Development Goals (SDGs) brings out a need for changing direction and taking a greener path. The 'European Green Deal' aims to transition the EU into a just and prosperous society having by 2050 no longer net emissions of greenhouse gases and having attained a decoupling of economic growth from resource use.
- Comprehensive national strategy for green research and innovation
- Climate and environmental challenges
Danish greenhouse gas emissions generally come from the energy sector, industry, transportation, and agriculture. To attain the target of a 70 percent greenhouse gas reduction by 2030 compared to 1990 levels and carbon neutrality no later than by 2050, we need a transition of all these sectors

“Global pollution of, among other things, air, soil, and water, increasing exploitation of the resources of the Earth, and global climate change are challenging nature, environment, and public health. Also, Denmark and the world are in the midst of a biodiversity crisis caused by man-made pollution and exploitation of natural resources and habitats, global spreading of invasive species, and climate change. The intensive exploitation of the open land, forests, coastal zones, and marine areas has caused nature to be fragmented and continuously exposed to a number of stress factors, which means that biodiversity is on a constant decline” (p.17)

New Initiatives

Together with a united Parliament, the Danish government decided on the allocation of research reserves for 2020 to boost public appropriations for green research.

Initiatives are aimed at:

- Green research and innovation partnership
- Enhanced green focus for Innovation Fund Denmark
- Better coordination of green research
- Better framework for cooperation between knowledge institutions and the business community
- Strong Danish participation in international cooperation

- Monitoring and impact assessments of green research
- National Centre of Climate Research
- **Green study Programmes**

This InFocus focuses on the educational aspect of the green transition and thus the ‘greening’ of study programmes. The Ministry of Higher Education and Science rightfully highlights that higher education plays a vital role in the green transition.

The Ministry of Higher Education and Science emphasise that higher education has “to create new knowledge and convert this knowledge into concrete green results that make a difference and pave the way for a greener and more climate-friendly society” (Ministry of Higher Education and Science, 2020). The Danish government will place its attention on supporting and strengthening the coherence between Danish higher education study programmes and the green transition.

The Request for Data from HEIs in Denmark to the Ministry on Green Transition in Higher Education

The Danish Ministry for Education and Science collected data in December 2021 on how higher educational institutions (HEIs) work to integrate green themes in educational programmes. Many institutions are working on integration of the 17 Sustainable Development Goals (SDGs)⁷ and broader sustainability perspective in educational programmes. This mapping focuses specifically on examining how educational programmes work with **green transition** and not a broader sustainability perspective such as social sustainability.

The Ministry has asked educational institutions, including CBS, to submit a mapping of the following seven subject themes in your programme:

- 1) Energy production
- 2) Energy effectiveness
- 3) Agriculture and food production
- 4) Transport
- 5) Environment and circular economy
- 6) Nature and biodiversity
- 7) Sustainable behavior and societal consequences

The Ministry is explicitly interested in understanding the following:

1. Do the students gain learning outcomes that affect green conversion **within one or more of the seven green themes**?
 - a. If so, what themes? (see table 1 below)

⁷ <https://sdgs.un.org/goals>

2. Are one or more green themes included in the description of the programme's core subject matter (the curriculum's initial description of the knowledge skills and / or competences acquired)?
3. Are one or more green themes included in the description of the courses in the education?
a. Are the themes included in compulsory subjects?
b. Are the themes included in non-compulsory subjects (e.g. electives, specializations, internships / project-oriented courses)?

THE CBS CONTEXT: Green Themes in our study programmes

To be able to address the questions posed by the Danish Ministry of Higher Education and Science, on how and where elements of green transitions are embedded in CBS study programmes, CBS conducted a content analysis of all its courses at all programme levels. The purpose was to identify course elements within the above mentioned seven themes, in the curriculum core competencies and learning objectives. The analysis also broke down the courses into electives or mandatory subjects.

In the academic year 2021-2022, CBS offered 18 Bachelor (undergraduate) programmes, 36 Master (graduate) programmes, as well as HD, Executive and special Master programmes.

CBS used the qualitative research tool NVivo to code data from courses in all study programmes for the key words presented in Table 1. The data consisted of study programme competency profiles (available on <https://studieordninger.cbs.dk/> and on individual study pages), course descriptions and learning objectives (available on <https://kursuskatalog.cbs.dk/>).

The files and information collected and analysed pertained to courses and programmes offered in Autumn 2021 and Spring 2022 and it included both mandatory and elective courses. During the key search and analysis, all relevant findings were coded to their specific theme. For every search result, the context was analysed and only relevant hits were recorded in the respective codes.

Theme 1. Energy production	Theme 2. Energy effectiveness	Theme 3. Agriculture and food production	Theme 4. Transport	Theme 5. Environment and circular economy	Theme 6. Nature and biodiversity	Theme 7. Sustainable behavior and societal consequences
energy OR renewable OR “energy prod*” OR “green energy” *power-to-X	“energy efficien*” OR energy OR “green energy efficiency”	agricultur* OR food* (production) OR pesticide*	transport OR [“green”] transport shipping* (*cautious)	environ*; circular* drinking water* ocean OR marine OR pollute OR Pollution OR	nature*; biodivers* *Soil [Health] *Antarctic* *ecosystem forest OR ecology OR	sustainable OR sustainability OR “sustainable development” OR “consequences” *Food waste

atmos *brint wind OR solar* OR geothermal* OR hydro*			airline* (cautious) infrastructure	conserv* OR fish consum* OR production OR waste OR "natural resources" OR recycl* OR "industrial ecology" OR "sustainable design"	conserv* OR "land use environment OR "global warming" OR weather OR environmental OR green OR climate OR "greenhouse gas" OR Co2 *GHG	*inclusive cit *smart cit *sustainable community [”Sustainable, Smart and Inclusive Cities and Communities”.]
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Table 1. Key words used in content analysis. Note : (the Danish equivalent of the English words were also included in the analysis).

The Coding Model as applied to CBS Study Programmes

We have selected three programmes as anonymized cases to illustrate how the findings appear using the coding model for the seven green themes shown in Table 1. We have included a Bachelor programme and two master level programmes at CBS.

Case 1: Bachelor Study Programme A (BSc. A)

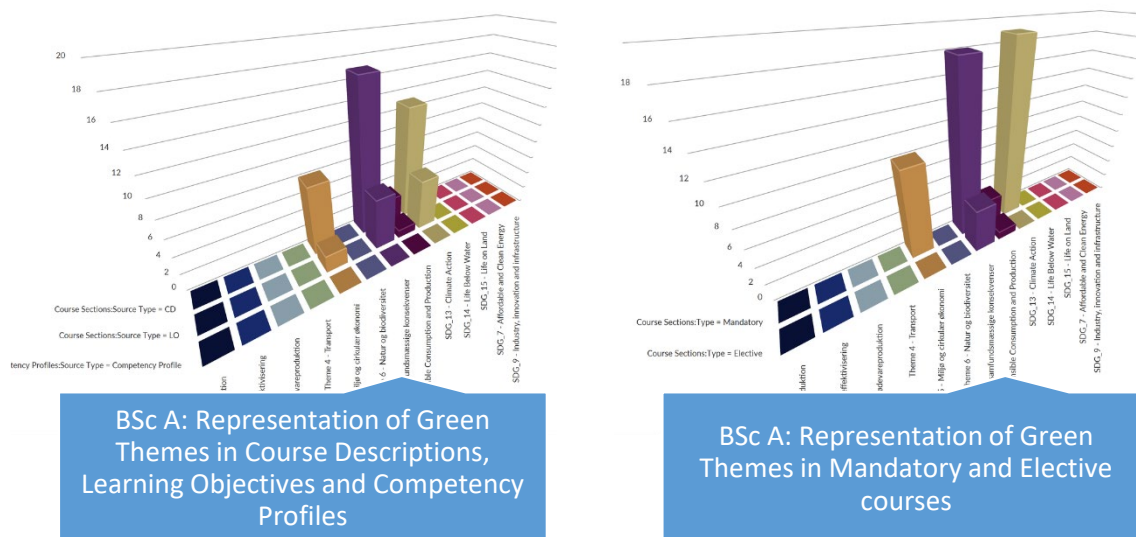


Figure 1: Case 1: Bachelor Study Programme A

Bachelor Study Programme A has extensive coverage of themes 5 through 7. The numbers in each cell of below table represents the number of hits (keywords) per theme. Please note that the coding has also been cross-checked with qualitative readings of the competency profile, learning objectives and course descriptions. You also see the breakdown per mandatory and elective courses.

Data Source/Type	Theme1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
B : Course Sections:Source Type = CD	0	0	0	0	11	13	17
C : Course Sections:Source Type = LO	0	0	0	0	3	6	6
D : Programme Competency Profiles:Source Type = Competency Profile	0	0	0	0	0	0	0
A : Course Sections:Type = Mandatory	0	0	0	0	13	19	18
B : Course Sections:Type = Elective	0	0	0	0	1	0	5

Table A1: Breakdown of keyword hits in BSc. A

The findings can also be presented visually through graphs. In the graphs above (Figure 1), some of the keywords have been categorized under their respective Sustainable Development Goals (SDGs).

Within the BSc A programme, the green themes are seen in both mandatory and elective courses, in course descriptions (CD) and learning objectives (LO) of the courses. Environment and circular economy, Sustainable development and social consequences, as well as Nature and biodiversity are the themes found represented in the BSc A courses.

While analyzing the course content, Theme 5 of the green themes was represented, for example, in the mandatory course “*Sustainability and Globalisation*”, which in its course description mentions the “holistic approach to sustainability and engagement with various social and environmental aspects and challenges as related to economic globalisation, including but not limited to value capture, climate change, environmental harms, gender inequality, global inequality and labour relations”.

Case 2: Master Study Programme A (MSc.A)

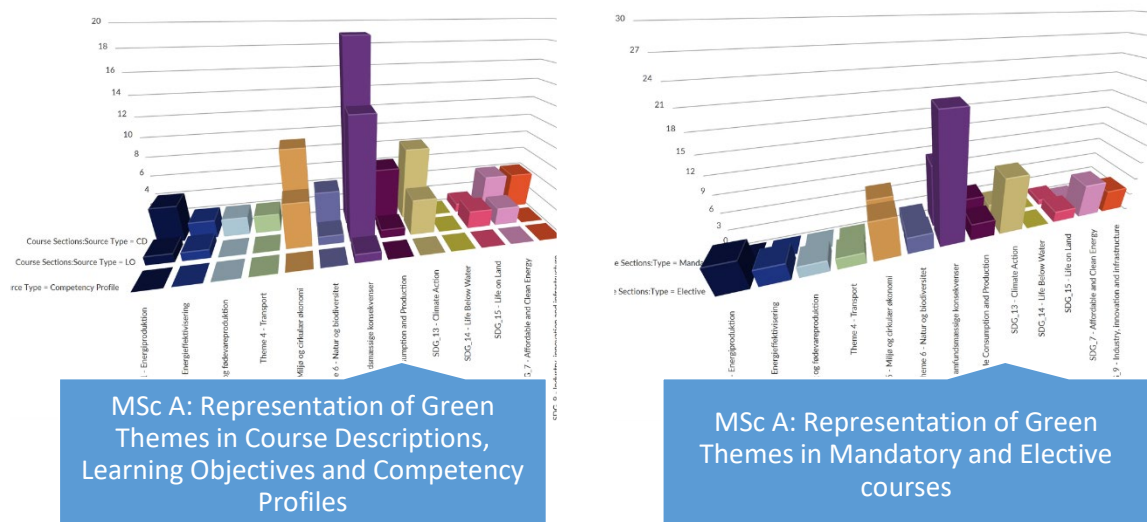


Figure 2: Case 2: Master Study Programme A

Table A2 illustrates the number of keyword hits per green transition themes and where the hits were located (course description, learning objectives, competency profile). Table A2 also illustrates coverage of the green transition themes per mandatory and elective courses offered in the programme.

In MSc A, all seven themes are represented in the course descriptions. Learning objectives cover all green transition themes except 3 and 4. We note that themes 3 (Agriculture and food production) and 4 (Transport) are more specialized topics of the green transition themes and do contain fewer keywords in comparison to some of the other themes.

The elective courses show substantial coverage of all seven themes.

Data Source/Type	Theme1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
A : Course Sections:Source Type = CD	8	2	2	6	15	13	19
B : Course Sections:Source Type = LO	3	1	0	0	6	7	13
C : Programme Competency Profiles:Source Type = Competency Profile	0	0	0	0	0	0	1
A : Course Sections:Type = Mandatory	0	0	0	0	11	5	11
B : Course Sections:Type = Elective	11	3	2	6	10	15	21

Table A2: Breakdown of keyword hits in MSc. A

Within the MSc A programme, the Green Themes are seen in both mandatory and elective courses, as well as in course descriptions (CD), learning objectives (LO) of the courses and in the programme's competency profile. All of the themes have been covered in course descriptions of either mandatory or elective courses in MSc A.

While analyzing the course content, Theme 1 of the green themes was represented, for example in the elective course “*Energy Transition for Development in Emerging Markets*”, which in its course description mentions the “key role multinational enterprises and public organizations can play in fulfilling international policy regarding the 2030 Agenda in production of clean and sustainable energy, however, energy production is a source of disputes across the world”.

Case 3: Master Study Programme B (MSc B)

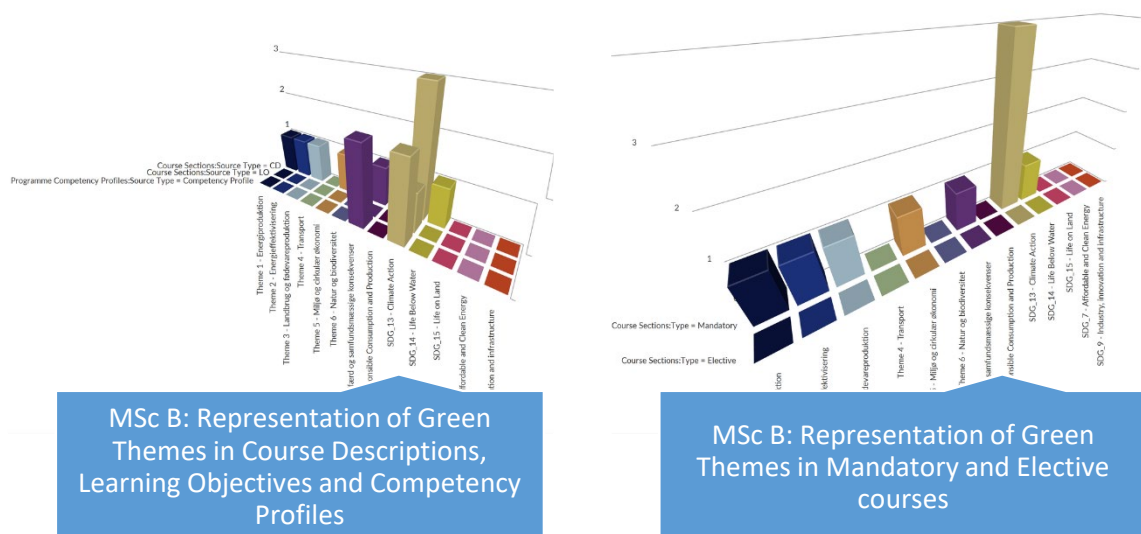


Figure 3: Case 3: Master Study Programme B

Master Study Programme B covers in its courses themes 1 to 7 with the exception of theme 4. The numbers in each cell of the below table represents the number of hits (keywords) per theme. Please note that the coding has also been cross-checked with qualitative readings of the competency profile, learning objectives and course descriptions. Table B1 illustrates the number of keyword hits per green transition themes and where the hits were located (course description, learning objectives, competency profile). Table B1 also illustrates coverage of the green transition themes per mandatory and elective courses offered in the programme.

In MSc B, all seven themes with the exception of theme 4 are represented in the course descriptions. Learning objectives cover theme 6. We noted that theme 4 (Transport) is a more specialized topic of the green transition themes and does contain fewer keywords in comparison to some of the other themes.

The mandatory courses show good coverage of all seven themes with the exception of theme 4. MSc B also covers themes 6 and 7 in its programme Competency Profile (CP).

Data Source/Type	Theme1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
A : Course Sections:Source Type = CD	1	1	1	0	2	3	1
B : Course Sections:Source Type = LO	0	0	0	0	0	1	0
C : Programme Competency Profiles:Source Type = Competency Profile	0	0	0	0	0	2	2
A : Course Sections:Type = Mandatory	1	1	1	0	2	4	1
B : Course Sections:Type = Elective	0	0	0	0	0	0	0

Table 4Breakdown of keyword hits in MSc. B

The findings can also be presented visually through graphs. In the graphs above (Figure 3), some of the keywords have been categorized under their respective Sustainable Development Goals (SDGs).

Within the MSc B programme, the green themes are seen in all mandatory courses (except one), in course descriptions (CD), learning objectives (LO) and in the programme's competency profile. All

of the themes, except for Transport have been covered in course descriptions or learning objectives in MSc B courses.

While analyzing the course content, Theme 2 regarding Energy Effectiveness was represented, for example, in the mandatory course “*Organizing Global Markets*”, which, in its course description, details the coverage of “issues such as: environmental standards; plastics, energy and water use; carbon markets; green accounting, taxation, pensions and investment, among others”.

Conclusion

Copenhagen Business School’s strategy supports the creation and further development of both research, education initiatives and actions with a strong focus on global/local society and business challenges.

Coding the seven green themes (Table 1) for the academic year of Fall 2021/Spring 2022 gives a high level overview of where in our programmes we cover the various seven green themes. It allows us to compare, not only between programmes, but also between Bachelor and Master level programmes. In addition, the coding shows whether the seven green themes are represented in mandatory or voluntary courses. The results show that the main coverage of the seven green themes across the programmes is in mandatory courses.

“The business school sector has much to build upon. Pioneering scholars have long focused on issues of the environment and sustainability. There has been a dramatic uptake in the last decade of attention to climate change by business scholars, encouraged by editorial statements and special issues in the leading journals in every one of our disciplines. In the classroom, these issues are increasingly being discussed in core and speciality courses, representing significant curricular shifts, and supported by our accrediting bodies” (Galdon et al., 2022)

This report has aimed to create an overview of policy work within the EU and locally in Denmark in regards to green themes in higher education. Furthermore, showing a structured methodology to understand the coverage of green themes in its programmes at CBS, allows for a holistic overview of which green themes (Table 1) are represented in which programmes and courses.

1. The analysis and reporting will function as a basis on which discussions about environmental sustainability in the institution’s educational activities can be taken. It can serve as a supporting tool to understand the ‘as-is’ picture. The exemplified cases in the article demonstrates the concrete material which can be generated and we have shown how this material enables us to get a precise picture on what is happening at the course and programme level.
2. The generated material strengthens the transparency and clarity in the internal and external communication regarding green coverage by giving a sense of magnitude of green elements

and themes covered in courses and programmes. In addition, a structured approach, allows for comparison of coded study programmes, over time.

3. Getting the overview of the green themes in higher education through a coding exercise, provides, the high-level overview for further work to advance both content coverage and scope, as well as pedagogical approaches that strengthen the advancement of environmental sustainability competences.

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Appendix 1. NORDIC 9 [N9]

NORDIC 9 at CBS. Special emphasis on competencies that explicitly embrace a wide range of sustainability competencies across our educational programmes.

KNOWLEDGE (K):

- a. you have deep business knowledge placed in a broad context
- b. you are analytical with data and curious about ambiguity
- c. you **recognise humanity's challenges** and have the entrepreneurial knowledge to help resolve them

VALUES (V):

- d. you are competitive in business and compassionate in society
- e. you understand ethical dilemmas and have the leadership values to overcome them
- f. you are critical when thinking and constructive when collaborating

ACTION (A):

- g. **you produce prosperity and protect the prosperity of next generations**
- h. you grow by relearning and by teaching others to do the same
- i. you create value from global connections for local communities