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Studying Sustainably: An Empirical Study on the Importance of Sustainability when Choosing a University

By Daniela Ludin[*], Pascale Schuster*[±], Jakob Steininger*[○], Erika Mueller*[•] & Wanja Wellbrock*[♦]

The aim of this study is to analyze the importance of sustainability in students' decisions for a course of study and a place of study and thus for a university. Empirical data from students are collected and analyzed. Results show that students have an inconsistent and incomplete under-standing of the concept of sustainability. It is the task of a university to close this gap. Although the idea of environmental protection has little influence on the choice of means of transportation to get to university, almost all respondents rated public transport connections to the university as important when choosing where to study. Furthermore, there is no strong correlation between choosing a sustainability-related degree course and one's own (sustainable) behavior in everyday life. However, students with a sustainability focus in their degree course are more likely than students without a sustainability focus to imagine working in such a professional field in the future. In general, the sustainability orientation of the university does not play a role for prospective students when choosing a course. Only students who are already interested in sustainability pay attention to this criterion when choosing their university. If universities want to attract sustainability-conscious students, they should make sure that they not only focus on sustainability in terms of content, but also provide a sustainable campus.

Keywords: study place selection, study place decision, student mobility, sustainability, university, university policy, career choice

Introduction

The Paris Climate Agreement has brought CO_2 emissions and sustainability to the center of the political debate and the public eye. Countries that ratified this agreement are bound to find ways to install climate mitigation measures as well as sustainable and innovative ways to alter mobility, production, education and other parts of life (European Commission, 2024; Hoffmann & Paulsen, 2020; United Nations, 2015). Besides that, other national and international (political) frameworks have been established to bring forward a sustainable transformation such as e. g. the Green New Deal (European Commission, 2024) or the 2030 Agenda for Sustainable

[*]Professor (Full), Heilbronn University, Germany.
[±]Student, Heilbronn University, Germany.
[○]Student, Heilbronn University, Germany.
[•]Sustainability Officer, Heilbronn University, Germany.
[♦]Professor (Full), Heilbronn University, Germany.

Development (United Nations, 2024a). The latter has 17 goals at its core that should try to create context for action to overcome social and environmental challenges. The UN member states have adopted the SDGs since 2015 (United Nations, 2015). SDG 4 particularly focuses on "inclusive and equitable quality education and promote lifelong learning opportunities for all" (United Nations, 2024b). This includes the creation of learning opportunities at primary, secondary and tertiary educational institutions (Chankseliani and McCowan, 2021). But also the other SDGs might play an important role in educational institutions, as they might impact or become more and more integrated into study and educational programs. Education for sustainable development is viewed a central element to prepare people and support them in gaining knowledge and skills for a transformation towards sustainability (Bauer et al. 2021; Holst, 2023). Given the point of view that sustainable development and the role that educational institutions might play in it is of increasing importance, the objective of this study is to gain an insight into whether students give sustainability the same value regarding their study choices. The study particularly tries to analyze, whether sustainability is of importance for the choice of a study program, a study location and as a result for a university. The results of the study are intended to contribute to a better understanding of the importance of sustainability in the university education sector and to derive, possible university policy recommendations for universities.

Literature Review

Focus and Method of the Literature Review

A systematic literature review is required to analyze the importance of sustainability in students' decisions on a course of study and a place of study and thus on a university. The literature analyzed publications from the last five years (2019-2023) that contain the key words "study place selection", "study place decision" and "sustainability" (Eco, 2015). However, not only the accuracy of fit, but also the quotability of the sources was considered when selecting the literature. Thus, only publications from journals with a double-blind review procedure were considered here. The literature selected and quoted in this study also has its origins from ranked journals that are listed in the VHB-JOURQUAL 3 ranking (https://vhbonline.org/service/vhb-jourqual/vhb-jourqual-3).

In addition to the literature analysis, secondary data analysis is used in this study. It enables the re-evaluation of data to answer new questions based on existing data (Glass, 1976).

Sustainability and Choice of University

Public awareness of environmental protection and, as a result, sustainability continues to grow (Sugiarto et al., 2022). Looking at the development of professions, it becomes clear that there is an increasing number of professions related to sustainability (Carballo-Penela et al., 2020; Karaca-Atik et al., 2023). Sustainability is

thus also becoming increasingly important in the development of study programs at universities (Salovaara, 2021; Samuelsson & Lindström, 2022) and the number of sustainability related study programs is therefore increasing (Alexander et al., 2022). The increase can also be explained by the fact that educational institutions play a central role in creating a sustainable future (Leal Filho, 2011; United Nations, 2024 b). Apart from the SDGs of the United Nations that include the role of education as pathway to sustainability, the United Nations have initiated more programs that concentrate on education in the last years. Thus, a "Decade of Education for Sustainable Development" was declared for the years 2005-2014, the UNESCO Global Action Programm on Education for Sustainable Development was installed (Unesco, 2016) and already in 2007 the Principles for Responsible Management Education (PRME) were started as an UN initiative (PRME Secretariat, 2024a; PRME Secretariat, 2024b; Figueiró et al., 2022). All these initiatives recognize the importance of (higher) education for sustainable development and foster actions to spread knowledge and to acquire necessary skills.

Thereby, university education cannot only encourage future consumers to adopt more environmentally friendly behavior (Begum et al., 2021; Maunula, Maunumäki, & Lähdesmäki, 2024), but it also aspires to provide the next generation of future business practitioners and career starters of all professions with necessary skills for a more sustainable economy and institutions (PRME Secretariat, 2024a; PRME Secretariat, 2024b; Figueiró et al., 2022; Holst, 2023; Karaca-Atik et al., 2023).

Against this background manifold research has emerged around sustainability and (higher) education. While some studies concentrate on different dimensions or barriers of the uptake of holistic approaches that might influence the integration of sustainability content into higher education organizations (e.g., Figueiró et al., 2022; Holst, 2023; Sidiropoulos, 2018), other studies investigate the necessary skills in detail (e.g., Karaca-Atik et al., 2023).

According to Fanea-Ivanovici and Baber (2022), sustainable universities do not only positively influence students' attitudes towards sustainability, but also encourage them to engage in sustainable entrepreneurial activity. This encouragement can have a scaling effect, as graduates have the intention to found sustainable start-ups and thus make sustainability more visible in everyday life. According to Sugiarto et al. (2022), however, it takes more than just a curricular anchoring that addresses and promotes sustainability to create a "sustainable campus". Callewaert et al. (2015) describe a culture of sustainability at universities as one in which university members (students, teachers, staff) are aware of environmental, social, and economic challenges and lead a sustainable lifestyle. However, the concepts of sustainability and sustainable development are defined differently by each individual and might be influenced by gender, age, attitude and further personal or educational aspects (Owens & Legere, 2015; Oberrauch et al., 2023, Sidiropoulos, 2018; Sundermann & Fischer, 2024). The literature review shows that students usually only mention ecological, i.e., environmental, criteria of sustainability and that social or economic criteria are clearly in the background and that less than a quarter of students have a balanced view of sustainability (Alexander et al., 2022). Students studying in sustainability-related study programs are an exception here, as these students have a broader understanding of sustainability (Salovaara et al., 2021).

So far, universities have made little effort to establish a uniform definition of sustainability at their educational institution (Owens & Legere, 2015). It is therefore of great importance that institutions close this definition gap by taking a clear position and establishing a uniform definition (Alexander et al., 2022). Changing curricula towards more sustainability-related content is one challenge that universities have to face. They also increasingly are challenged to work on implementing sustainability in their governance and operational field (Holst, 2023; Leal Filho et al., 2023). Thus, e.g., paperless administration and resource-efficient buildings, for example, are also seen as fundamental to sustainable universities. In particular, the climate efficiency of buildings is a priority for students when it comes to the "campus culture of sustainability"; recycling and energy-efficient or energy-saving concepts are also important. Social or economic aspects such as participation in committees by underrepresented groups are not present for most students (Alexander et al., 2022). It should also be noted that the proportion of female students at tertiary education institutions is steadily increasing and that women are more aware of their responsibility towards the environment than men (Garcia-Salirrosas, 2023). In terms of sustainability when choosing a mean of transport to get to university, for example, women tend to walk, take public transport or cycle. Men are more likely to choose the car as a mean of transportation (Bagdatli & Ipek, 2022). However, the distance to the university and the socio-economic status of the students are also decisive factors (Urmi, 2022).

In times of demographic change in Europe, universities are competing for students. Due to the sustainability trend, it is in the interest of universities to adapt their study programs accordingly. However, the sustainability of a university itself can also become a competitive advantage for a university; they already advertise with figures on CO_2 emissions, for example. However, it should be noted that so far there are only very limited correlations between the institutional environmental performance and the sustainability initiatives of educational institutions. Accordingly, there are no statistically significant correlations between existing sustainability initiatives and greenhouse gas emissions or energy and water use (Lang, 2015).

The described necessity for sustainability education and assumed benefits for a sustainable transformation as well as the institutional efforts of universities to become more sustainable and to broaden their range of sustainability related study program are only one side of the medal. The other side would be, whether students also request more sustainability related content, if they want to choose a sustainable career, if sustainable education has impacted on their views and what affects their choices (Fleșeriu et al., 2020; Leal Filho et al., 2023; Oberrauch et al., 2021; Sidiropoulos, 2018). Understanding the motives for study choices is an emerging research stream, not only related to sustainability, but also to success in finalizing studies, building certain competencies and employability (Fleșeriu et al., 2020; Oberrauch et al., 2023). For example, Oberrauch et al. (2023) investigated the relevance of intrinsic and extrinsic motives for study choices and levels of engagement on teacher and non-teacher training students and found out that study choices are mostly driven by intrinsic motivations, but gender, age, sustainability concepts and sustainability related self-efficacy might play a role as well.

Research Gap and Research Questions (RQ)

This study likes to contribute to this field of research by conducting a survey at a German university, as it might show which university activities have an effect or how and whether they could be adapted to further support sustainability education or where these activities reach their limits. The literature review integrates the present study into the state of research. It encompasses the indexing and processing of the findings documented in literature (Snyder, 2019).

Based on this, the following six research questions (RQ1, RQ2, RQ3, RQ4, RQ5 and RQ6) were derived to identify the existing research gap:

RQ1: What understanding do students have of the concept of sustainability? RQ2: How important is the mean of transportation to the university when choosing a university?
RQ3: Is there a connection between choosing a sustainability-related course of study and one's own (sustainable) behavior in everyday life?
RQ4: Which students can imagine working in a sustainability-related field in the future?
RQ5: Does the sustainability orientation of a university play a role for prospective students when choosing a course of study?
RQ6: What do universities need to do to recruit sustainability-conscious students?

Methods

The study was conducted at Heilbronn University. A convenience sampling approach was used, as the survey link was distributed via WhatsApp to reach a wide range of students from different study programs. Access to the questionnaire was provided digitally via a link that led to the online survey (Wagner-Schelewski & Hering, 2019). A total of 122 students took part in the online survey from late April to early May 2023. The sample consisted of 57% women, 41% men and a small proportion of diverse participants.

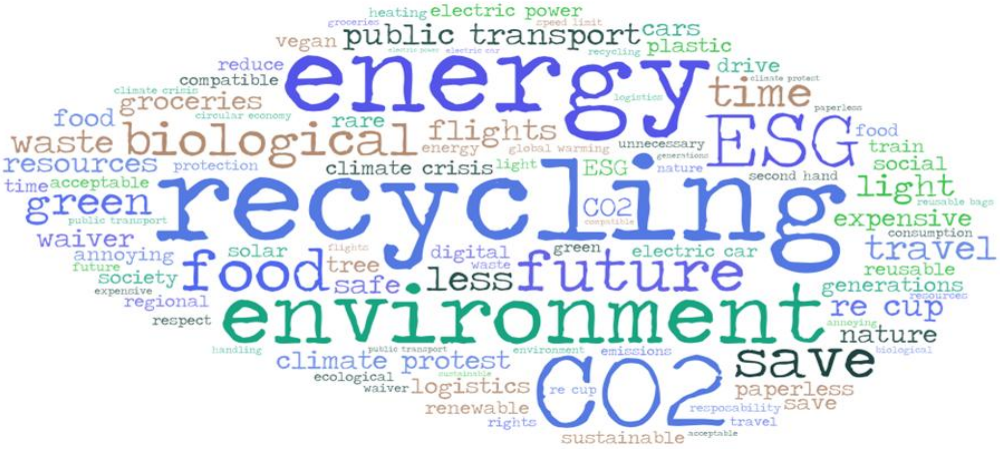
The questionnaire was developed based on insights from the literature review. Therefore, relevant variables and constructs related to sustainability in higher education could be derived, which improved the structure of the research study. The questions were designed to directly correspond to the six research questions (RQ1, RQ2, RQ3, RQ4, RQ5 and RQ6) to ensure that the survey captured the key aspects of the paper. A quantitative cross-sectional design was chosen to capture students' attitudes and perceptions at a specific point in time and to provide a snapshot of their views on sustainability when choosing their course and place of study.

The questionnaire consisted of ten items, including Likert-scale questions to assess students' attitudes, one open-ended question, and one ranking question. The structure aimed to balance quantitative measurability with opportunities for open feedback. A small pretest with a subset of students was done to ensure clarity and comprehensibility of the questions before launching the full survey. Descriptive statistical procedures are used for data analysis and interpretation.

Results

The survey results show that despite the increasing importance of sustainability, students do not have a complete overview of this topic and therefore do not provide a uniform definition, which is in line with findings of other studies that constitute that the concept(s) of sustainability among students is diverse and influenced by factors such as age, cultural or educational background respectively their study field (Oberrauch et al., 2023; Sidiropoulos, 2018; Sundermann & Fischer, 2024). Figure 1 shows the most frequently mentioned terms relating to sustainability in a word cloud.

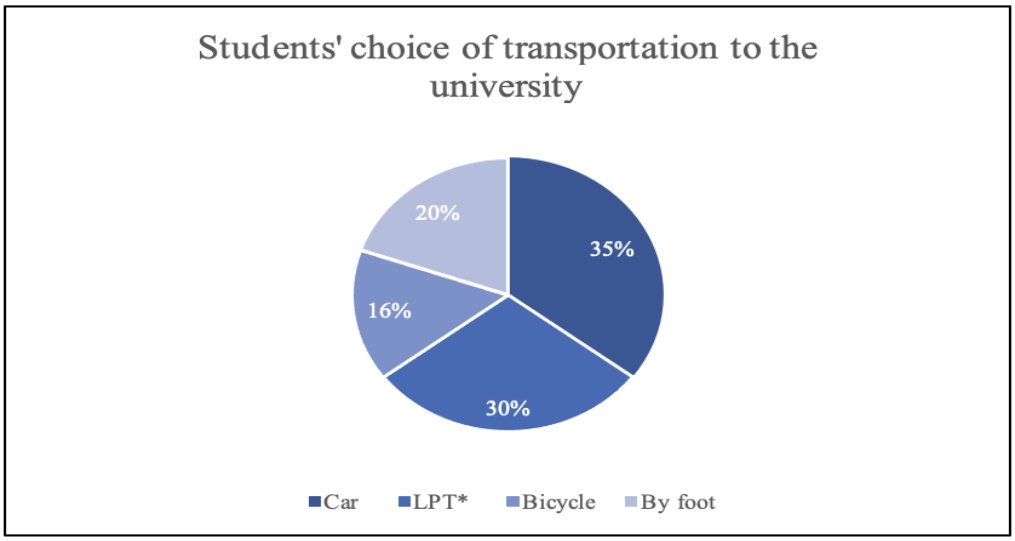
Figure 1. Word Cloud of the Sustainability Criteria



Students see the ecological aspects of the three areas of sustainability almost exclusively; social and economic aspects take a back seat. This result corresponds to the findings of the study by Alexander et al. (2022). It cannot be confirmed here that students from study programs with a sustainability focus have a more balanced overview, as shown by Salovaara et al. (2021). Terms such as “renewable energies”, “environmental protection” and “CO_2 emissions" are also mentioned most frequently among these respondents. The word cloud of sustainability shows a need for action at universities to ensure a uniform understanding of sustainability among their students.

Figure 2 shows the respondents' answers to question 3 “Which means of transport do you mainly use to get to university?”.

Figure 2. Students' Choice of Transportation to the University



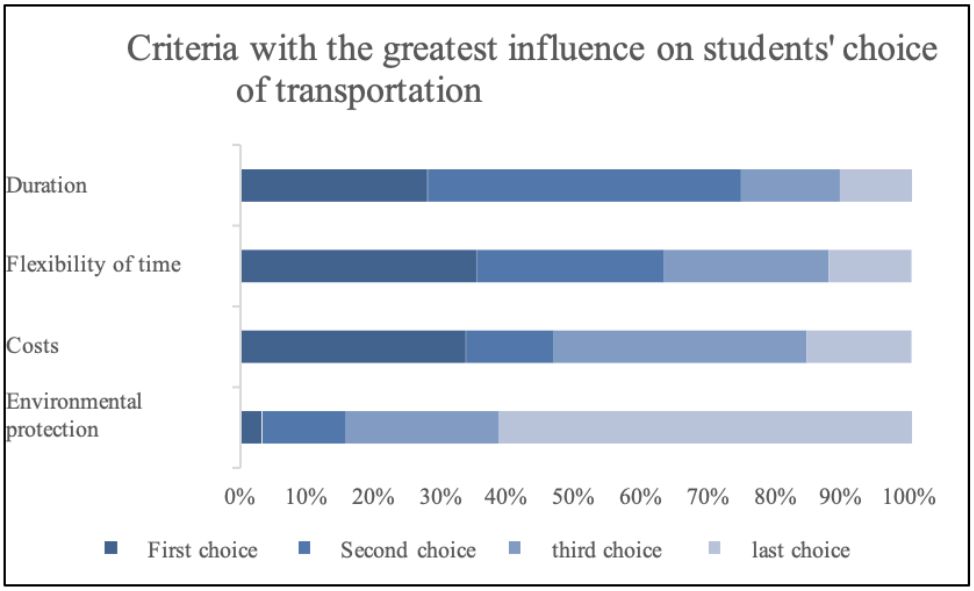
*LPT = Local public transport

The relative majority of students come to university by car. The remaining 65 percent choose a more climate-friendly alternative. However, 36 percent of respondents come by bike (16 percent) or on foot (20 percent). It can therefore at least be inferred that around a third of students live within walking or cycling distance of the campus.

The absence of significant gender differences is particularly interesting when collecting data. The trend observed by Bagdatli and Ipek (2022, p. 25) that men are comparatively more likely to use a car cannot be confirmed. The result of this study is that 36% of men and 34% of women use the car. Although the proportion of men is higher, it is not significant enough to make a generalized statement. The breakdown of the remaining means of transportation also paints an identical picture. None of the means of transportation is clearly preferred by one gender. Only a slight tendency can be seen in the use of bicycles and public transport. While 14% of men use the bicycle, 17% of women choose the bicycle as their means of transportation. Public transport, on the other hand, is slightly preferred by men. 32 percent of the male students surveyed and only 29 percent of the female students surveyed use public transportation. However, this small difference in preferences also contradicts Bagdatli and Ipek (2022).

As already mentioned, it is not possible to break down the choice of means of transportation solely into attitudes towards sustainability and environmental protection. For this reason, the students in this study were asked about the main factors influencing their choice.

Figure 3. Criteria with the Greatest Influence on Students' Choice of Transportation



The duration of the daily commute has the greatest influence, closely followed by time flexibility. The cost of their choice of transportation was usually ranked third by the students and environmental protection was by far the least frequently chosen (Figure 3). This shows that the factors of duration, time flexibility and cost are significantly more relevant than environmental protection when choosing a means of transportation. Thus, the factors identified in the literature review, such as socioeconomic status and distance to the educational institution, are also reflected in the results of the present study.

The relevance of public transport connections for students is also interesting. The average rating of respondents was 4.28 out of a possible 5 points. Public transport users rated the importance of this higher at 4.8. Of course, it is relevant for students who take the bus or train to the university how well the university is connected to public transport. However, students who do not have to rely on these means of transportation also rate the relevance as above average at 4.1. It is therefore important to students that even if they themselves do not use public transport to get to university, other students have the option of a good connection.

Another result of this survey shows that just under ten percent of the students surveyed are enrolled on a sustainability-related course at Heilbronn University. There were no clear differences in terms of the gender of the respondents. It could be assumed that the sustainability of the university is more important to students on sustainability-related courses than students on courses without sustainability content.

Furthermore, 70 percent of students on sustainability-related courses can imagine working in a sustainability-related profession. 10 percent do not yet know whether they want to work in a sustainability-related profession and 20 percent cannot imagine doing so. If only students on degree courses with no connection to sustainability are considered, the proportion of those interested in a profession with a connection to sustainability is significantly lower at around 40%. Female students

are slightly abler to imagine working in a sustainable profession after graduation. Only 47 percent of male students answered yes to this question, while 52 percent of female students answered yes. Another result of the survey is that all students who place a lot or very much value on sustainability in their everyday lives can also imagine working in a sustainability-related career.

A comparison of the average values for the question "How important is sustainability to you in your degree program?" and the question "How much value do you place on sustainability in your everyday life?" reveals the following: More students attach importance to sustainability in their private lives, with an average of 3.3 out of 5 points, than rate sustainability in their degree program as important. The average for the latter is 2.6 out of 5 points.

As outlined in the study by Sugiarto et al. (2022), universities can have a major influence on students' attitudes towards sustainability. For example, through curricula that focus on sustainable content. The importance of such a curriculum was rated as not very high by the respondents with an average of 2.68 out of 5 points. The average answer of 3.9 for students attending a sustainability-related degree course is significantly higher than that of students on other degree courses at 2.6. And when it comes to assessing the importance of the university's climate footprint, students on sustainability-related degree courses also rated the relevance higher at 3.4 than their fellow students with an average answer of 2.8. This trend is not surprising and shows that both groups have chosen suitable degree courses in line with their preferences.

Accordingly, this data can also be used to answer the question of whether universities should actively advertise sustainable course content and a sustainable campus. For the students surveyed, the sustainability of the university is of secondary importance and therefore does not constitute a competitive advantage over other universities. However, students who are already interested in studying sustainability-related courses will evaluate and select their future university in terms of sustainability. As mentioned above, the main focus is on the university's environmental protection and climate compatibility and not on social or ecological aspects. Accordingly, advertising with climate-friendly and sustainable factors only makes sense for a university and sets it apart from other universities if the course content is also geared towards sustainability.

Discussion

There is no strong correlation between choosing a sustainability-related degree course and one's own (sustainable) behavior in everyday life (RQ3). The reasons for this may be manifold as research on motives for study choice are diverse, complex and individual. What needs to be considered as well is that besides the big role that especially intrinsic motives play, can maybe explained with the so-called attitude-behavior gap (Oberrauch et al., 2023). However, students with a sustainability focus in their degree program are more likely than students without a sustainability focus to imagine working in such a professional field in the future (RQ4). In general, the sustainability orientation of the university does not play a role for prospective

students when choosing a course. Only students who already show an interest in sustainability pay attention to this criterion when choosing their university (RQ5). Nevertheless, other factors come into play for study choices that are of importance for the individual and cannot be overlooked or even changed. For example, success in finalizing studies, building certain competencies, social status that can be gained, gender, social and cultural background as well as employability and personal skills and interests are to mention here (Sundermann & Fischer, 2024; Fleșeriu et al., 2020; Oberrauch et al., 2023). Oberrauch et al. (2023) also remark that the possibility to experience self-efficacy might have an effect as well. This shows limits and challenges to universities and their sustainability activities. Although the idea of environmental protection has little influence on the choice of means of transportation to get to university, 65 percent of respondents still use a climate-neutral or at least environmentally friendly means of transportation. However, public transport is only used by around a third of respondents. Nevertheless, almost all respondents rate the importance of local public transport connections as very significant. Accordingly, public transport connections to the university play a major role in the choice of study location (RQ2), which is a valid reason. Offering maybe more online course formats or self-learning courses might be an idea that universities have to investigate for themselves, if they want to attract students from different locations.

Conclusion

Limitations and Future Research

The sample size of this study is quite small, as only students from Heilbronn University have been integrated. That means that also the variety of fields of study is limited as well. And like any study based on convenience sampling, this research is subject to sampling error because participants were not randomly selected but recruited via WhatsApp. In addition, the online survey format may have influenced response behavior due to self-selection bias. It is therefore questionable to what extent the available results can be transferred to a broader student population. Furthermore, the choice of a written online survey and thus quantitative data collection means that the response options are standardized and thus the variety of feedback is limited. The choice and depth of questions also affected the informative and interpretative value of the answers received. Conducting qualitative data collection in the form of interviews, for example, might have left more scope for detailed answers. In addition, distortions of the study results cannot be ruled out, as the proportion of women surveyed is significantly higher than the proportion of men surveyed. Average values in which no attention was paid to gender-specific differences are therefore more influenced by female students in percentage terms. As found in other studies gender might have an effect on motives for study choices, but also on the understanding of the sustainability concept (Oberrauch et al., 2023; Sundermann &d Fischer, 2024).

Nevertheless, the study provides important insights into students' attitudes towards sustainability and serves as a basis for further, more representative research.

Awareness of sustainable action is increasing in society and that this is also having an impact on various professional fields and courses of study. Future studies could, for example, analyze the effectiveness of university sustainability strategies on students. Or how the interest of students in sustainability-related courses can be increased. Also, understanding motives for study choices in more detailed way might be helpful for universities, but also possible employers.

Practical Implications

The students demonstrate an inconsistent and incomplete understanding of the concept of sustainability. It is the task of a university to close this gap. It is recommended that the university establish a definition of sustainability and incorporate it into the university's program development and communication (Alexander et al., 2022). This can be done through initiatives with specific branding, promoting interdisciplinary collaboration and supporting learning inside and outside the classroom (Perrault & Clark, 2017) (RQ1). Furthermore, if universities want to recruit sustainability-conscious students, they should ensure that they not only focus on sustainability in terms of content, but also provide a sustainable campus (RQ6). As other research suggests, it would also be important to not only add sustainability into a few courses, but to understand sustainability as a whole institution effort. Also, revisiting curricula as well as learning formats is found to be crucial to increase the understanding of the concept of sustainability and to increase engagement and feelings of self-efficacy among students (Holst, 2023; Sidiropoulos, 2018; Leal Filho et al., 2023; Oberrauch et al., 2023; Sundermann & Fischer, 2024). Universities might start with conducting their own survey to find out about the situation at their institution and to adapt future measures accordingly.

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