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## Insights on climate change in a business university setting: a case of *Environmental Management* students

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### ABSTRACT

This study investigates the perspectives of Makerere University Business School (MUBS) students enrolled in the Environmental Management (EM) course on climate change. Using a focus group methodology, the research explored the attitudes and perceptions of 22 third-year Bachelor of Leadership and Governance students. Guiding questions rooted in climate change policy decision-making were employed to facilitate discussion. The findings reveal that all students displayed a strong awareness of both local and global climate change issues. Their environmental engagement ranged from recycling and reducing energy consumption to advocating for school-wide energy-saving initiatives, such as the installation of thermal energy generators. Students also reported noticeable shifts in local climate patterns, with many expressing concern over rising global temperatures and future environmental risks. Varied opinions emerged regarding the anthropogenic causes of climate change, with some students attributing it to natural cycles, while others recognized human activity as a significant contributor. This research provides valuable managerial insights for academic institutions, emphasizing the need to integrate climate change education into the curriculum and promote student-led environmental initiatives. Additionally, it underscores the importance of addressing climate change perceptions to foster greater collective action among students. This study contributes to the limited body of knowledge on climate change perspectives in university settings, particularly in Uganda.

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Environmental Issues;  
Curriculum

## Introduction

Climate change has emerged as one of the most pressing global challenges of the 21st century, affecting multiple sectors, including education. Business schools are uniquely positioned to address this issue by educating future leaders on the environmental, social, and economic implications of climate change. In this context, universities play a critical role in shaping awareness and fostering sustainability-driven leadership among students (Browning, 2020). As institutions focused on producing the next generation of business professionals, business schools have a responsibility to incorporate environmental sustainability into their curricula. This includes equipping students with the knowledge and skills necessary to confront climate change and embed sustainability into their business practices (Whiteman et al., 2013).

“This research is one of a kind as it accelerates the implementation of the UN (United Nations) sustainable development goals in curriculum especially in a business university setting. The United Nations Educational, Scientific and Cultural Organization (UNESCO) and Global Action Programme (GAP) have all launched and advocated for sustainable development in all areas of education (UNESCO, 2016), and Makerere University Business School (MUBS) is no exception. As a result, MUBS has incorporated sustainable related course units in most of its curricula, with the Bachelor of Leadership and Governance

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being the pioneer of sustainable education with units on Environmental Management. This helps students and future leaders in attaining knowledge and education on how to ensure a sustainable environment and a better future for all.”

MUBS, one of the leading business institutions in Uganda and Africa, is at the forefront of these efforts. With programs such as Environmental Management, MUBS aims to raise awareness and instill a sense of responsibility among its students regarding climate change. Given Uganda’s vulnerability to climate change impacts, ranging from unpredictable rainfall patterns to rising temperatures, it is crucial that students, particularly those studying Environmental Management, grasp the significance of these changes and their potential consequences for business and society (Nabikolo et al., 2012; Kyambade et al., 2024e).

This study also evaluates the alignment of the Environmental Management curriculum at MUBS with global sustainability goals, particularly focusing on the United Nations Sustainable Development Goals (SDGs) like Climate Action (Goal 13) (United Nations, 2015). By examining students’ understanding of climate change and their preparedness for addressing environmental challenges, the findings reveal how well the curriculum aligns with international sustainability standards. Strengths identified include climate literacy and sustainable leadership training, while gaps, such as limited experiential learning opportunities, suggest areas for enhancing the curriculum to meet global sustainability demands (Sterling & Thomas, 2006; Lozano et al. 2015a).

Understanding the perceptions and insights of Environmental Management students at MUBS regarding climate change is essential in assessing how well-equipped they are to deal with these future challenges. This study explores these students’ awareness, attitudes, and preparedness for addressing climate change within a business context, contributing to the growing body of literature on sustainability education in higher learning institutions. By doing so, the study highlights the role of business schools in addressing environmental sustainability and the necessity of integrating climate change insights into their broader educational objectives (Lozano et al., 2015b).

This research seeks to provide insights into how Environmental Management students at MUBS perceive climate change, their understanding of its impact on the business world, and the practical measures they believe are necessary to tackle these issues. It also assesses the extent to which the curriculum is aligned with global sustainability goals and how well it prepares students for future leadership roles in a climate-affected business landscape.

**RQ:** How do Environmental Management students at Makerere University Business School perceive climate change, and to what extent does their education prepare them to address climate change challenges within the business context?

By addressing this question, the study will provide insights into the level of climate change awareness among business students, the relevance of sustainability education in a business school setting, and how business schools can contribute to preparing future leaders for a climate-constrained world.

The findings of this study are expected to provide valuable insights for educators, policymakers, and business leaders looking to align business education with the global push for sustainability. This is particularly important as Uganda, like many other developing countries, seeks to balance economic growth with environmental stewardship in a rapidly changing climate. The study also aims to highlight potential gaps in the Environmental Management curriculum at MUBS and suggest ways to better prepare students for leadership roles in addressing climate change.

By integrating insights from climate change education, the research contributes to the broader discourse on sustainability in higher education. Specifically, it addresses the critical need for developing informed and proactive future leaders who can navigate the complexities of a climate-affected business landscape. This focus aligns with global educational initiatives that emphasize equipping students with the competencies to tackle environmental challenges and advocate for sustainable business practices (Anderson, 2021; Barth & Rieckmann, 2016; Kyambade et al., 2024f). Furthermore, the study’s findings are expected to guide curriculum development, fostering a deeper commitment to environmental stewardship among students, and encouraging their participation in sustainability-focused initiatives, ultimately enhancing the university’s role in mitigating climate change impacts (Sterling et al., 2017).

## Literature review

### *Environmental management education in business schools*

Historically, business schools have prioritized financial performance and profitability over environmental considerations. However, over the past few decades, there has been a shift toward incorporating environmental issues into business education. This shift has been driven by increasing awareness of environmental degradation and the realization that businesses have a significant impact on natural ecosystems (Bansal & Roth, 2000). The inclusion of environmental management in business schools began in the 1990s, with the introduction of corporate social responsibility (CSR) and sustainability courses. These courses initially focused on ethical decision-making, but over time, they expanded to address environmental sustainability and the need for businesses to adopt environmentally friendly practices (Starik et al., 2010; Kyambade et al., 2024d). Today, many business schools offer dedicated programs in environmental management, sustainability, and green business practices. The field of environmental management education is evolving rapidly in response to new environmental challenges and changes in the business world. One emerging trend is the increasing emphasis on experiential learning. Business schools are incorporating real-world environmental management projects, internships with sustainable businesses, and partnerships with environmental organizations into their curricula. These hands-on experiences help students apply theoretical knowledge to practical situations and develop the skills needed to manage environmental issues in a business context (Barth & Michelsen, 2013).

Another trend is the growing focus on interdisciplinary approaches to environmental management education. Many business schools are partnering with environmental science, engineering, and public policy departments to offer joint programs or dual degrees that combine business education with environmental expertise. This interdisciplinary approach reflects the complexity of environmental challenges and the need for business leaders who can collaborate with experts from other fields (Stubbs & Cocklin, 2008). Business schools are also increasingly adopting sustainability frameworks, such as the United Nations' Principles for Responsible Management Education (PRME) and the Global Reporting Initiative (GRI), to guide their curricula and research agendas. These frameworks provide business schools with a set of principles and best practices for integrating environmental sustainability into their teaching and research, and they encourage collaboration with other academic institutions, businesses, and NGOs to promote corporate environmental responsibility (Principles for Responsible Management Education (PRME)), 2020; Kyambade, 2023).

### *Perception of climate change among university students*

Studies consistently show that university students tend to be aware of climate change and its associated risks. Research across different regions has found that students generally recognize the reality of climate change, its anthropogenic causes, and the potential consequences for the environment and human society (Mead et al., 2012; Stevenson et al., 2016). For instance, a survey conducted among students in the United States found that the majority believe that climate change is happening and is primarily caused by human activities (Leiserowitz et al., 2019). Similarly, a study of European students showed high levels of awareness about global warming and its potential impacts (Shepherd et al., 2009). However, while students are often aware of climate change, their depth of understanding can vary. Research suggests that although students may be familiar with terms such as "global warming" and "greenhouse gases," they often lack a nuanced understanding of the complex scientific processes driving climate change (Fisher, 2016). This gap in understanding is important because it can limit students' ability to engage critically with climate issues and to evaluate the effectiveness of different mitigation strategies.

Media, including traditional news outlets, social media, and entertainment platforms, plays a crucial role in shaping how students perceive climate change. Studies indicate that the media can both enhance awareness and, in some cases, contribute to misinformation about climate change (Boykoff, 2008). Social media platforms have emerged as key spaces for climate change discourse, especially among younger generations, providing a space for information sharing, activism, and debate. However, the role of social media in shaping climate change perceptions is complex. While it can facilitate the spread of climate science and activism (e.g., through movements like Fridays for Future), it can also

amplify misinformation and create echo chambers that reinforce pre-existing beliefs, whether those beliefs align with or reject climate science (Olausson, 2011). In recent years, studies have explored the impact of social media campaigns and influencers in driving youth engagement with climate issues. Research has found that students who engage with climate content on social media are more likely to participate in climate activism and adopt pro-environmental behaviors (Andersson, 2020). This highlights the potential of digital platforms to act as important tools for climate education and awareness among university students.

Universities play a critical role in shaping students' understanding of climate change and their engagement with environmental issues (Kyambade et al., 2024b). Courses on environmental management, sustainability, and climate science provide students with the tools they need to understand the causes and consequences of climate change and to develop solutions (Peters & Heinrichs, 2015). Furthermore, universities that integrate sustainability into their operations and campus culture provide students with practical examples of how climate-friendly practices can be implemented in real-world settings (Sterling et al., 2017). Research has shown that climate change education in universities can foster positive attitudes toward climate action. Students exposed to sustainability education are more likely to engage in pro-environmental behaviors, support policies that address climate change, and pursue careers in sustainability-related fields (Barth & Michelsen, 2013). Universities that actively promote climate change education are, therefore, essential in cultivating a generation of students who are prepared to address the global climate crisis.

In addition to understanding climate change, many university students are actively involved in climate advocacy and sustainability initiatives. Student-led environmental organizations, such as the international Fridays for Future movement, demonstrate the growing concern among young people about the climate crisis (O'Brien et al., 2018). These groups often focus on raising awareness, advocating for policy changes, and implementing sustainability initiatives on campuses (Mugambwa et al., 2024). However, studies also indicate that while many students express concern about climate change, not all are actively engaged in climate action. Factors such as perceived barriers to action, lack of knowledge about how to get involved, and feelings of powerlessness can deter students from participating in climate activism (Clayton et al., 2015). Addressing these barriers through targeted climate education and opportunities for student involvement in sustainability projects is crucial for increasing student engagement with climate solutions.

## **Methodology**

To expand on this research and comprehend university students' perspectives on climate change. The Makerere University Business School (MUBS) students who were enrolled in the Environmental Management (EM) course unit were selected. Using a series of guiding questions that are frequently used in policy decision-making connected to climate change, the focus group approach was chosen to examine relationships within the group about the respondents' attitudes on particular themes (Peterson, 2004). Focus group participants were chosen at random from the third-year Bachelor of Leadership and Governance (BLG) students in the program where EM is taught. Interviews were conducted with 22 respondents from BLG, consisting of 8 men and 14 women in the 20–35 age range.

Before any data was collected, a thorough examination of the relevant literature was conducted. The majority of the secondary information sources are made up of archival research. Books, official records, conference proceedings, and reports from the Makerere University Business School library were among these sources. Another helpful resource used in the writing of this essay was the thesis collection from the university library. For the review, numerous published articles in the field of environmental research were consulted. The majority of these came from internet databases. Finally, important reports and articles on the subject were downloaded using the World Wide Web. We looked through the websites of numerous regional and global non-governmental organizations to learn more about the history of the problem.

This study employed a case study methodology since case studies usually look at how all the variables interact to give a thorough knowledge of an event or circumstance (Colorado State University, 2009). Researchers have previously reported findings on how people perceive the risk of climate change

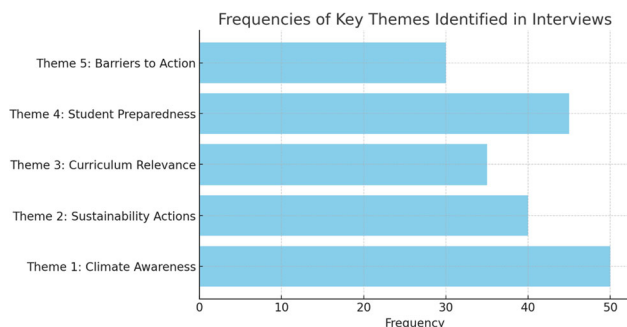
using case study methodology (Vedwan & Rhoades, 2001; Grothmann & Patt, 2005). Makerere University Business School was selected as the case study area for this study with a number of considerations in mind. These comprised the length of the survey, the location of the site, and the area's accessibility. A variety of primary research techniques were employed to gather data in order to enable the case study. Since this university offers EM courses, we initially met with students in class to identify potential interview subjects. After that, key informants were called to discuss the goals of the study and arrange a convenient time and day for an interview. To gather the research data, several sessions were held over the course of two to eight weeks. Secondly, a smaller subset of the entire MUBS population was chosen using sampling. Snowball sampling (Mack et al., 2005) was applied a few times.

A questionnaire was created for the purpose of gathering data after the study location was selected. Before one was created, a thorough analysis of sample questionnaires from earlier research on the subject was conducted. It was made sure that the questions gathered information to address every goal and purpose of the research. The purpose of the questionnaire was to gather background information on the participants, including name, age, race, occupation, and length of university studies. Its purpose was to find out how much the informants knew about climate change. The participants were asked to list the primary sources of knowledge about climate change that they had come across in a variety of media, including radio, newspapers, television, village meetings, church, general conversations with people, and community climate workshops. Based on an understanding of Uganda's typical media for disseminating information, the prompts were chosen (Kyambade et al., 2024a). Those respondents who were available for a 30-to-45-minute interview were also subjected to structured interviews. This section's open-ended questions were meant to gather information about local environmental changes and awareness of climate change. In order to learn more about the respondents' opinions on climate change, its causes, and their sources of knowledge, the interviewer employed open-ended questions that allowed the respondents to freely react to the questions.

Since English is MUBS's medium of instruction and the official language of Uganda, the interviews were done in this language. A smartphone was used to record the interviews. After that, the recordings were transcribed to make data analysis easier. In order to make conclusions, the data from the interviews were analyzed. This involved building themes, relationships between variables, and patterns in the data based on the content. The underlying meaning of the interviews was ascertained using content analysis of the interview transcripts. Content analysis in this study entailed a systematic examination of the interview transcripts to interpret the underlying meanings conveyed by the respondents. This involved identifying common themes, expressions, and language use to uncover the participants' perceptions and attitudes (Hsieh & Shannon, 2005; Elo & Kyngäs, 2008). The goal was to generate a qualitative narrative that provides deeper insights into the participants' understanding of climate change and sustainability issues. The process of content analysis helped in organizing collection of stories to find common threads. By carefully reading and categorizing interview responses, we identified shared ideas about climate change and sustainability, helping us understand students' overall views. Through this rigorous approach, we were able to develop a comprehensive understanding of the students' views, helping to draw meaningful conclusions aligned with the research objectives (Braun & Clarke, 2006). Themes were identified through a blend of inductive (from raw data) and deductive (guided by research questions) coding. Multiple researchers reviewed the data to enhance reliability and an iterative process allowed for revisiting and refining themes as analysis progressed. Ultimately, the data was sorted and retrieved using the coding method. The coding process involved several structured activities. Initially, the transcribed interview data was carefully reviewed to identify recurring themes, phrases, and key patterns. Open coding was employed as the first step, allowing us to segment the data into meaningful units by labelling relevant responses (Saldaña, 2016). For example, a response discussing climate awareness was tagged with a corresponding label. This was followed by axial coding, where the identified codes were grouped into categories based on their relationships and underlying themes (Strauss & Corbin, 1990). For instance, "climate knowledge" and "sustainability actions" were connected under a broader category of "environmental education." Finally, selective coding was used to refine and integrate these categories, leading to the development of broader themes that reflected the core concepts from the interviews (Charmaz, 2014). This involved refining these categories into overarching themes, such as "climate preparedness," capturing the core concepts of the interviews.

**Table 1.** Frequencies.

Theme	Frequency
Climate Awareness	50
Sustainability Practices	40
Curriculum Relevance	35
Student Preparedness	45
Barriers to Action	30

**Figure 1.** Frequences of key themes.

The coding process helped in sorting items into groups based on similarities. Initially, each piece of interview data was given a simple label (open coding). Then, similar labels were grouped together into categories (axial coding). Finally, these categories were combined into bigger themes that summarize the main ideas from the interviews. To ensure reliability and validity, we reviewed the coding process to minimize bias. Inter-coder reliability was assessed by comparing coding results among team members and Memo-writing was used to track coding decisions and ensure consistency throughout the analysis.

Microsoft Excel was utilized to conduct a quantitative analysis of the data gathered from the qualitative survey. This electronic spreadsheet application is used to store, arrange, and work with data. The spreadsheet was first designed with the goal, the data required, the headings, and the layout in mind. The author became acquainted with the spreadsheet's operation by using the Microsoft online assistance tool. After that, all of the information gathered from the student surveys was input into the worksheet's cells. Because charts are aesthetically pleasing and facilitate users' ability to perceive comparisons, patterns, and data trends, the initial step of the research involved looking at the frequency distribution and rating of important metrics using counts and percentages. It is well acknowledged that research benefits greatly from the application of both qualitative and quantitative research approaches.

Qualitative research offers information about people, attitudes, beliefs, understanding, and interpretations, whereas quantitative analysis evaluates links between variables and depicts quantity (Danya International, 2003). Qualitative research methods are crucial for applied research because they offer important insights into the local views of the population being studied (Mack et al., 2005). In order to accomplish the aims and objectives of this investigation, the qualitative approach was considered suitable and employed.

Key Themes Identified in Interviews were Climate Awareness with 50 mentions reflecting a strong focus on understanding climate issues and their global implications, Sustainability Practices with 40 mentions highlighting discussions around actionable strategies for promoting sustainability, curriculum relevance with 35 mentions suggesting students value education that aligns with real-world environmental challenges, Student Preparedness with 45 mentions indicating student's readiness to address environmental challenges, emphasizing the importance of equipping students with practical skills and Barriers to Action with 30 mentions - this was the least mentioned theme but still noteworthy for identifying obstacles to implementing sustainable practices as shown in Table 1.

The chart in Figure 1 above displays the frequencies of key themes identified in the interviews with Environmental Management students. It highlights the relative importance of each theme, with "Climate Awareness" and "Student Preparedness" having the highest frequencies, indicating a strong focus on climate-related knowledge and readiness to address environmental challenges. On the other hand, "Barriers to Action" had the lowest frequency, suggesting that obstacles to implementing sustainability

actions may be less frequently discussed but are still noteworthy in the context of the study. These results provide insight into the participants' perceptions and the overall focus of the interviews. This study highlights key areas of focus in environmental education among students. The frequent mentions of "Climate Awareness" reflect its importance in understanding global issues, while "Student Preparedness" points to the need for practical training. "Barriers to Action," though discussed less often, identifies challenges that require attention to ensure sustainability efforts succeed.

## Findings

### Interviews

Every student at the school demonstrated awareness of the issues surrounding local and global climate change. They also reported engaging in a wider range of related environmentally friendly behaviors, such as recycling, consuming less energy, setting up student-led associations for in-school energy monitoring, adopting a vegan diet, and pushing for the installation of a thermal energy generator in the school. Pupils had a greater understanding of local and global climate change.

The local climate was considerably colder when I was younger; the dry seasons were shorter and the wet seasons were longer. Past dry seasons weren't quite so stuffy. These days, in addition to the stench of automobile waste, the heat makes me feel even more anxious. It's incredibly muggy and stuffy. (Pupil 1)

The wet seasons weren't as chilly, except for that one recent occasion when it was about 20 degrees in Kampala. As you can see, wearing extremely warm clothing or anything else wasn't really necessary. (Pupil 4)

Students' responses when questioned on the trajectory of global climate change in the future.

It will be warmer than fifty degrees. (Pupil 1)

No matter how advanced technology gets in the future, I believe we won't be able to save the environment and climate if we don't start taking action today. (Pupil 2)

As a result of the fact that we are wasting a lot of the resources we currently have, pollution is rising, and global warming is getting worse, I watched this video. It basically illustrates how, in the future, if global warming continues to worsen, it will affect every season and cause disasters, including the drowning of some cities. All I know is that the future is not good. (Pupil 5)

Students did not show any discernible differences when asked if the climate has altered. Every student's explanation was extremely well-developed.

Has the weather altered? I believe that everyone in the area is familiar. January, which is a few months ago saw the temperature hit a record low. How many years was it in place? I overlooked it. These extremes indicate that summer temperatures are rising and winter temperatures are falling. I believe that global warming is driven by human activity, most likely through resource exploitation and deforestation. Global warming was brought on by industrial development, and there will be more heat and cold waves in the future. the temperature balance had shifted...It had beyond the capacity of the planet. There will be ongoing global warming. The rivers and lakes will dry. (Pupil 8)

Students' opinions on climate change in the future were similar when asked:

As of right now, I believe that neither the climate nor the ecology are at their worst; but, if people carry on living in the same manner as they are without making any changes, the situation will only worsen. Overuse of resources, resource exploitation, pollution production, water waste—all of these would only exacerbate the environment and intensify climate change. (Pupil 5)

The speaker at a seminar I went to when I was younger claimed that the sea level would increase by six meters if all of the glaciers on Earth melted. This is terrible. However, I think everything will be alright in the future. I believe that many nations and their leaders are conscious of the issue and are working to make changes, like cutting back on waste or emissions. Given that we are at least aware of the issues, I believe the future will be bright. (Pupil 7)

The students' efforts to address climate change were the most notable area of difference between them.

At home, we solely use fans, we don't have an air conditioner or a heater. We just use fans since the air conditioner uses too much energy and looks awful on the utility bill. (Pupil)

Reduce your use of paper towels and green up your house by adding plants. In terms of the climate, I try to use fans instead of air conditioners as often as possible because they release hot air. (Pupil 5)

There are moments when my heart is willing but my skills are not. I understand how awful the situation we are in is, and I know what I should and ought to do. However, when you consider these things, you might also feel confined to your house. I don't think anyone could endure the current 32 degree Celsius without an air conditioner. My family never turns off the air conditioner. This makes me feel horrible. However, I always sort and recycle my garbage. It's actually not always easy to do what you preach. (Pupil 4)

Green campaign was started by our former guild president, wherein the green environment is preserved. I have been a member for the past two years. It has come a long way. Since recycling was our main focus at first, each classroom has paper recycling bins that we gather and place in the collecting bin. When it was first established, or when I joined, I believe the most pressing problems were air conditioning and paper. Thus, those were the two projects that our school has essentially put into practice. We have now endeavored to encourage bicycle travel, as is the case at Makerere University. because a lot of basically needless autos drive by our school every morning and after school. It adds to air pollution in addition to generating traffic. (Pupil 3)

### **Student dialogues**

Individual journals and dialogue sessions gave students the chance to reflect more fully on their own understanding of climate change as well as their attitudes and perceptions. It became evident throughout class discussions, particularly in the beginning of the course, that groups were at odds over the reasons for climate change. Examples 1 and 2 illustrate how some groups were more open to the idea of anthropogenic influences than others. Some groups talked about how individuals in their immediate vicinity saw climate change and how living in Kampala, the capital city of Uganda, tended to affect people's perceptions (example 3). Every group acknowledged that there were changes in the Earth's climate and could offer proof of these changes (example 4). While some groups (example 5) suggested remedies based on the need for changes in society and individuals, other groups (example 6) did not believe that human activity could affect the climate. However, groups that did not link climate change to anthropogenic causes did not take into consideration any potential solutions to the problem (examples 2 and 6), at least not in the beginning of the course. In contrast, groups that described anthropogenic causes also illustrated solutions that required individual and societal action (e.g., examples 1 and 5). Example 4 shows the topic of the discourse that Student 2 was involved in and is taken from their group discussion. The given samples demonstrated that the hand-sensor data acquired during discussion sessions captured on-task conversations, with the degree of attention being typical of student conversations.

#### **Example 1**

"Do you think climate change is happening?" asked the group leader. Why? Or why not? Student 2: "There is a cycle on Earth itself." That is a component of changing climate. Student 1: "That's correct. There are times when people transgress and regress. Student 3: "I believe that the current state of affairs is normal." However, I believe that human behavior has potential as well. Group Leader: "It's true that something is going on. We're not sure if it's man-made, natural, or merely ... Third student: "Perhaps it's both." Leader of the group: "It might be both." Student 1: "I think that the idea of taxing us more is an elitist scam." Student 3: "You can see that the Earth's crust underwent the same process that we are." The cycles of the atmosphere remain the same notwithstanding the presence of some man-made emissions. That's simply my opinion on the matter. It will simply continue that cycle. Student 1: "We might not be the only cause, but we might be contributing to it." "I think we're definitely adding to it," says student four.

#### **Example 2**

"Do you think climate change is happening?" asked the group leader. Why not? Student 3: "I know that humans have altered the climate in some ways, but mostly it's just been the weather getting hotter naturally after all these classes I took here." In some of my lessons, the teachers demonstrated how, historically, there has always been a rise and fall in the main temperatures and other variables; this has just been a cycle or natural process. Even if we may not have had a major impact, our contribution was insignificant. To be honest, I believe everything will happen naturally. Student 1: "How does Venus have such a large amount of greenhouse gases? On Venus, no one resides. That happens in a natural way. If that's

what's happening there naturally, how are we aggravating it? Although we might be aggravating the situation, he claims that it is primarily natural. Group Leader: "The Earth's climate is changing every second of the day. I studied meteorology and Earth science last semester." For thousands of years, it has been. That provides fairly strong proof that it alters. Student 1: "Climate change is obviously real when you look at history and say, 'Oh, there have been multiple ice ages.'" Group Leader: "Even the available data is not clear or succinct; even Al Gore continues to fly around in his fancy jets." He preaches about global warming while simultaneously contributing to it. Student 2: "I believe they exaggerate the situation a little bit by blaming the individuals when, in actuality, it is a natural process."

### Example 3

"Do you think climate change is happening?" asked the group leader. Why? Or why not? Lead Student: "Well, it appears to be happening to everybody." Simply put, the majority of individuals believe it to be true. Student 1: "Well, most of the people involved admit that it is happening, but some of the people who are actually involved and vocal about it deny it altogether, and some people just think the whole concept of global warming is ridiculous." Simply put, they don't think anything is happening at all. Student 2: "My grandparents believe that global warming is unreal and that climate change is a hoax." They believe it to be something out of a fairy tale. First student: "Especially here in the South." It seems like the winters in [the state where the student is from/fort portal] used to be much worse, and you would think that older people would remember that. I suppose all it takes is one harsh winter for them to become traumatized. Group Leader: "Yeah, you're like, [jokingly] Global warming? When temperatures drop into the twenties?" How come? [laughs]

### Example 4

"Do you think climate change is happening?" asked the group leader. Why Or why not? Student 1: "Yes." Student 2: "Yes." Student 3: "Well, that's simple." Student 4: "It is taking place." Student 3: "Yes, it is occurring." Student 4: "A lot of evidence is available." such is the rise in sea level, the ice caps melting on Mount Rwenzori, the carbon stored in the ice, and the powerful thunderstorms. Third student: "There is proof everywhere." "But like, there's just evidence everywhere," says Student 4.

### Example 5

"What are some potential solutions to address climate change?" asked the group leader. Student 2: "I believe the decision would be whether to employ mitigation or adaptation." I believe that if everyone was aware of it, they would know how to feel about it. They might have more insightful opinions. Student 1: "I really believe that to be the main issue." Individuals just don't have opinions since they only receive information from a single source, such as the news, regarding things. "You can make them learn, but you can't make them care," said Student 2. Student 1: "That is accurate." Student 3: "We could try to persuade people to cease causing pollution." It would require strong persuasion. Student 4: "For some of the policies we're wanting to implement, it might come down to taxes." For example, taxing those who emit more pollution than others will incentivize them to reduce their pollution.

### Example 6

"What are some potential solutions to address climate change?" asked the group leader. Student 1: "I thought everyone understood that climate change was essentially inevitable." I'm not sure I get it. There are no answers that I am aware of for the natural world. Student 2: "It's not really possible." Student 4: "It depends on how big of an impact you believe climate change to be and what causes it." Although I believe we can all agree that it's most likely a natural phenomenon, there are many who believe it is solely the result of humans and similar things. Of course, we could add a little bit more.

It would have been challenging to glean information about the perspectives of the students without the dialogues. Students were able to express their opinions and listen to those of others in group discussions. They were also able to incorporate course material such as topics on mitigation, adaptation, and the causes and evidence of climate change into their discussions all semester long.

## Discussion

The findings from interviews and dialogue sessions reveal a wide range of awareness, perceptions, and actions regarding climate change among students. The results indicate that most students are aware of

both local and global climate change, with many showing a deep understanding of its causes and potential future impacts. These findings align with previous research, which emphasizes that younger generations, especially those exposed to environmental education, tend to exhibit heightened awareness of climate change issues (Boyes et al., 2009; Olausson, 2011).

The students displayed an awareness of climate change, with some noting personal observations, such as changes in temperature patterns and the increasing impact of pollution. This is consistent with previous studies suggesting that personal experiences can significantly shape individuals' perceptions of climate change (Myers et al., 2013). Students' references to hotter seasons, colder seasons, and increased pollution reflect the changing climatic conditions and their impacts on daily life. The literature highlights the importance of localized climate experiences in enhancing public engagement with climate issues (Dawson, 2012). Moreover, the students' awareness extended beyond their local context, with many discussing the global implications of climate change. They acknowledged the melting of glaciers, rising sea levels, and the global imbalance in temperature regulation, which are well-documented phenomena (Stevenson et al., 2016). Their understanding of the global nature of climate change mirrors findings from past studies that emphasize the role of education in broadening students' perspectives on global environmental challenges (Monroe et al., 2017).

One of the most distinctive contrasts between students was the level of action they took to combat climate change. Many students demonstrated proactive behaviors, such as recycling, limiting energy consumption, and participating in environmental campaigns. These actions reflect a deeper commitment to addressing environmental issues and are consistent with the notion that environmental education fosters environmentally responsible behaviors (Stevenson et al., 2016; Boyes et al., 2009; Kyambade et al., 2024b, 2024c). Some students expressed frustration with the gap between their environmental awareness and their ability to fully practice environmentally friendly behaviors. For instance, despite recognizing the environmental benefits of minimizing air conditioning use, some students felt constrained by their living environments, where air conditioning was deemed necessary. This struggle highlights the broader issue of how socioeconomic and contextual factors can limit the extent to which individuals can act on their environmental knowledge (O'Brien et al., 2018). The formation of student-led environmental groups, such as the Green Campaign at MUBS, underscores the potential for youth-driven initiatives to foster environmental responsibility within schools. Such initiatives have been shown to play a critical role in shaping the environmental culture of schools and in encouraging collective action among students (Monroe et al., 2017).

There was a notable divide among students regarding the causes of climate change, with some attributing it primarily to natural processes while others recognized the significant role of human activities. This divide reflects broader societal debates on climate change, where public opinions are often split between natural and anthropogenic causes (Boyes et al., 2009). The dialogues between students showcased the complexity of climate change discourse, with some students acknowledging the potential for human activity to exacerbate natural climatic cycles. This aligns with previous research, which suggests that while many young people accept the reality of climate change, they often struggle to fully grasp the anthropogenic factors involved (Shepherd et al., 2009).

When discussing future trends, some students expressed a pessimistic outlook, predicting extreme temperatures and environmental degradation if human activities continue unchecked. Others were more optimistic, believing that global efforts, such as reducing emissions and conserving resources, would mitigate the worst impacts of climate change. This mix of hope and concern is common in climate change perception studies. O'Brien et al. (2018) found that while young people often acknowledge the severity of climate change, they also hold hope that technological advancements and policy measures will address the problem. The contrasting views on the future reflect a broader tension between skepticism and optimism in climate discourse. Some students expressed doubt in the efficacy of human actions to fully counteract the natural and human-induced drivers of climate change. This skepticism mirrors findings by Monroe et al. (2017), who observed that despite an increase in climate change knowledge, some individuals remain unconvinced of the power of individual or collective action. Conversely, optimistic students cited increasing global awareness and efforts to address climate issues, which reflects the role of environmental education in fostering a sense of agency (Olausson, 2011; Stevenson et al., 2016).

## Implications for climate change education

The discussions and interviews highlight the importance of contextualized and participatory climate change education. Students who engaged in environmental campaigns or school-wide initiatives demonstrated a stronger commitment to sustainable practices. This suggests that experiential learning, where students actively participate in climate solutions, can significantly enhance their environmental engagement (Peters & Heinrichs, 2015). Moreover, dialogue-based learning, as observed in the discussion groups, allowed students to explore and refine their understanding of climate change causes and potential solutions. Encouraging peer-to-peer learning in climate change education could enhance the depth of student understanding and promote collaborative problem-solving skills. The mixed perceptions about the anthropogenic causes of climate change also suggest a need for clearer communication in climate education, particularly regarding the human contributions to global warming. In line with Shepherd et al. (2009), these findings point to the necessity of addressing misconceptions and fostering critical thinking in climate change curricula. Students need opportunities to critically evaluate evidence, understand the complexity of climate systems, and recognize the impact of human activity on these systems.

## Conclusion

The findings from the study offer valuable insights into university students' perceptions and behaviors regarding climate change. It's encouraging to see that students, particularly those from business schools, are highly aware of both local and global climate change issues, and many have adopted environmentally friendly practices such as recycling and limiting energy consumption. This reflects a growing sense of responsibility among young people, which is vital for tackling climate challenges. However, the range of opinions on the causes and future of climate change suggests the need for more robust climate change education that not only informs but also empowers students to take meaningful action. The dialogues show that experiential and participatory learning can significantly enhance climate change awareness and engagement. When students are actively involved in environmental campaigns and sustainable initiatives, they are more likely to translate their knowledge into action. This reinforces the critical role that educational institutions, such as business schools, can play in fostering environmental stewardship and creating future leaders who are equipped to address climate change. The next steps for educators and policymakers involve not only enhancing climate education curricula but also encouraging collaborative, action-oriented learning experiences. By doing so, we can continue to inspire students to contribute to a more sustainable and resilient world.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

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## References

- Anderson, R. (2021). Integrating sustainability in business education: Challenges and opportunities. *Journal of Sustainability in Higher Education*, 10(3), 235–251.
- Andersson, M. (2020). The role of social media in shaping climate change perceptions among young people. *Journal of Environmental Communication*, 14(1), 1–19.
- Bansal, P., & Roth, K. (2000). Why companies go green: A model of ecological responsiveness. *Academy of Management Journal*, 43(4), 717–736. <https://doi.org/10.2307/1556363>
- Barth, M., & Michelsen, G. (2013). Learning for change: An educational contribution to sustainability science. *Sustainability Science*, 8(1), 103–119. <https://doi.org/10.1007/s11625-012-0181-5>
- Barth, M., & Rieckmann, M. (2016). Developing key competencies for sustainable development in higher education. *International Journal of Sustainability in Higher Education*, 17(4), 404–421.
- Boyes, E., Chuckran, D., & Stanisstreet, M. (2009). How do high school students perceive global warming and climate change? What are their major misconceptions? *Science Education International*, 20(1–2), 5–15.
- Boykoff, M. (2008). The cultural politics of climate change discourse in UK tabloids. *Political Geography*, 27(5), 549–569. <https://doi.org/10.1016/j.polgeo.2008.05.002>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Browning, M. (2020). Preparing the next generation of leaders: Climate change education in business schools. *Journal of Business and Society*, 58(1), 11–23. <https://doi.org/10.1080/00472778.2020.116083>
- Charmaz, K. (2014). *Constructing grounded theory* (2nd ed.). Sage.
- Clayton, S., Devine-Wright, P., Stern, P. C., Whitmarsh, L., Carrico, A., Steg, L., Swim, J. K., & Bonnes, M. (2015). Psychological research and global climate change. *Nature Climate Change*, 5(7), 640–646. <https://doi.org/10.1038/nclimate2622>
- Colorado State University. (2009). Case studies: Writing@CSU guide. Retrieved from <https://writing.colostate.edu>
- Danya International. (2003). *Qualitative research methods manual*. Danya International, Inc.
- Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing*, 62(1), 107–115. <https://doi.org/10.1111/j.1365-2648.2007.04569.x>
- Fisher, S. (2016). University students' understanding of climate change: A cross-cultural study. *Journal of Environmental Education*, 47(4), 294–303.
- Grothmann, T., & Patt, A. (2005). Adaptive capacity and human cognition: The process of individual adaptation to climate change. *Global Environmental Change*, 15(3), 199–213. <https://doi.org/10.1016/j.gloenvcha.2005.01.002>
- Hsieh, H.-F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, 15(9), 1277–1288. <https://doi.org/10.1177/1049732305276687>
- Kyambade, M. (2023). The role of case studies in teaching business ethics: A literature review. *International Journal For Multidisciplinary Research*, 5(4).
- Kyambade, M., Mugambwa, J., Namuddu, R., Namatovu, A., & Kwemarira, G. (2024c). Staff commitment in Ugandan public universities: Does servant leadership matter? *SEISENSE Business Review*, 4(1), 29–43. <https://doi.org/10.33215/6h3x1822>
- Kyambade, M., Mugambwa, J., Nkurunziza, G., Namuddu, R., & Namatovu, A. (2024a). Servant leadership style and socially responsible leadership in university context: moderation of promoting sense of community. *International Journal of Educational Management*, 38(3), 660–678. <https://doi.org/10.1108/IJEM-12-2023-0629>
- Kyambade, M., Namatovu, A., Mugambwa, J., Namuddu, R., & Namubiru, B. (2024d). Socially responsible leadership and job engagement in university context: Mediation of psychological safety. *SEISENSE Journal of Management*, 7(1), 51–66. <https://doi.org/10.33215/61rnkr91>
- Kyambade, M., Namuddu, R., Mugambwa, J., & Namatovu, A. (2024e). I can't express myself at work: encouraging socially responsible leadership and psychological safety in higher education setting. *Cogent Education*, 11(1), 2373560. <https://doi.org/10.1080/2331186X.2024.2373560>
- Kyambade, M., Namuddu, R., Mugambwa, J., & Namatovu, A. (2024f). Psychological safety and innovative work behavior: does socially responsible leadership matter? *SEISENSE Business Review*, 4(1), 1–13. <https://doi.org/10.33215/6gahb262>
- Kyambade, M., Nkurunziza, G., Sewante, L., Namatovu, A., & Tushabe, M. (2024b). Servant leadership and healthy work relationships in university context: a moderated mediation analysis of psychological safety and socially responsible leadership. *Cogent Education*, 11(1), 2418802. <https://doi.org/10.1080/2331186X.2024.2418802>

- Leiserowitz, A., Maibach, E., Roser-Renouf, C., & Smith, N. (2019). Climate change in the American mind: Data, trends, and implications. *Environmental Communication*, 13(5), 719–730.
- Lozano, R., Ceulemans, K., & Seatter, C. S. (2015a). Teaching sustainability in European higher education institutions: Assessing the connections between competences and pedagogical approaches. *Sustainability*, 7(4), 3292–3314. <https://doi.org/10.3390/su7043292>
- Lozano, R., Merrill, M. Y., & Makara, J. (2015b). The impact of higher education on sustainable development: Mapping the curriculum in business schools. *Sustainability Journal*, 7(1), 1–18.
- Mack, N., Woodson, C., MacQueen, K. M., Guest, G., & Namey, E. (2005). *Qualitative research methods: A data collector's field guide*. Research Triangle Park, NC: Family Health International.
- Mead, J., Roser-Renouf, C., Leiserowitz, A., & Maibach, E. (2012). Understanding university students' perceptions of climate change. *Global Environmental Change*, 23(1), 27–38.
- Monroe, M. C., Plate, R. R., Oxarart, A., Bowers, A., & Chaves, W. A. (2017). Climate change and education: Addressing barriers to knowledge and action. *Environmental Education Research*, 23(3), 370–379.
- Mugambwa, J., Ntamu, D. N., Kwemarira, G., Sewante, L., & Kyambade, M. (2024). Co-evolution and fisheries policy implementation in sub Saharan Africa. *Public Organization Review*, 24(1), 259–280. <https://doi.org/10.1007/s11115-023-00758-6>
- Myers, T. A., Maibach, E. W., Roser-Renouf, C., Akerlof, K., & Leiserowitz, A. (2013). The relationship between personal experience and belief in the reality of global warming. *Nature Climate Change*, 3(4), 343–347. <https://doi.org/10.1038/nclimate1754>
- Nabikolo, D., Bashaasha, B., Mangheni, M. N., & Majaliwa, J. G. M. (2012). Determinants of climate change adaptation among smallholder farmers in Eastern Uganda. *African Crop Science Journal*, 20(2), 303–312. <https://doi.org/10.4314/acsj.v20i2.13>
- O'Brien, K., Selboe, E., & Hayward, B. (2018). Youth and environmental action: Exploring global trends. *Ecology and Society*, 23(2), 1–12.
- Olausson, U. (2011). "We're the Ones to Blame": Citizens' representations of climate change and the role of the media. *Environmental Communication*, 5(3), 281–299. <https://doi.org/10.1080/17524032.2011.585026>
- Peters, M. A., & Heinrichs, H. (2015). Integrating sustainability into business education curricula. *Journal of Business Ethics*, 127(4), 619–634.
- Peterson, T. C. (2004). Guiding questions for climate change policy decision-making. *Journal of Environmental Policy & Planning*, 6(5), 233–248.
- Principles for Responsible Management Education (PRME). (2020). United Nations Global Compact.
- Saldaña, J. (2016). *The coding manual for qualitative researchers* (3rd ed.). Sage.
- Shepherd, M., Leiserowitz, A., & O'Neill, S. (2009). The perception of climate change in Europe: Insights from university students. *Climate Change Communication Journal*, 5(3), 234–250.
- Starik, M., Rands, G. P., Marcus, A. A., & Clark, T. S. (2010). In search of sustainability in management education. *Academy of Management Learning & Education*, 9(3), 377–383. <https://doi.org/10.5465/AMLE.2010.53791821>
- Sterling, S., & Thomas, I. (2006). Education for sustainability: The role of capabilities in guiding university curricula. *International Journal of Innovation and Sustainable Development*, 1(4), 349–370. <https://doi.org/10.1504/IJISD.2006.013735>
- Sterling, S., Maxey, L., & Luna, H. (2017). *The sustainable university: Progress and prospects*. Routledge.
- Stevenson, K. T., Peterson, M. N., & Bondell, H. D. (2016). Predicting youth involvement in environmental activism: The role of knowledge, attitudes, and personality. *Personality and Individual Differences*, 98, 140–148.
- Strauss, A. L., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Sage.
- Stubbs, W., & Cocklin, C. (2008). Teaching sustainability to business students: Shifting mindsets. *International Journal of Sustainability in Higher Education*, 9(3), 206–221. <https://doi.org/10.1108/14676370810885844>
- United Nations. (2015). *Transforming our world: The 2030 agenda for sustainable development*. <https://sdgs.un.org/2030agenda>
- Vedwan, N., & Rhoades, R. E. (2001). Climate change in the Western Himalayas of India: A study of local perception and response. *Climate Research*, 19(2), 109–117. <https://doi.org/10.3354/cr019109>
- Whiteman, G., Walker, B., & Perego, P. (2013). Business schools and climate change: A call for action. *Academy of Management Learning & Education*, 12(3), 396–405.
- Whiteman, G., Walker, B., & Perego, P. (2013). Planetary boundaries: Ecological foundations for corporate sustainability. *Journal of Management Studies*, 50(2), 307–336. <https://doi.org/10.1111/joms.12023>