

Mediating climate change rhetoric to increase lexical knowledge of students at university level

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Abstract. Global observed and anticipated climatic changes nowadays, as well as global warming, are remarkable global changes that have occurred over the last years. Climate change (CC) is a worldwide inter-governmental complex problem with implications for many ecological, environmental, socio-political, and socioeconomic disciplines. The globe is currently confronting a variety of natural disasters as a result of climate change. This paper aims to focus on a different perspective of climate change, which is the one related to education, observed from a linguistics point of view. Climate change has evolved from a primarily physical phenomenon to one that is also social, political, ethical, cultural, and communicative. This paper also contributes to an improved understanding of the mediation of climate change discourse and of the role of language in this issue, related to the Albanian context. It employs an evidence-based and problem-solving method of research, composed of a series of workshops with students conducted during English classes. The conclusions of this paper revealed that the series of workshops conducted, served as a great way to enrich students' vocabulary and prepare them for new challenges related to natural disasters

1 Introduction

For many decades, the field of natural sciences has extensively documented the causes and consequences of climate change, encompassing its intricate nature and inherent uncertainties. This global predicament stands as one of the utmost urgent challenges confronting humanity in the present era. However, the ongoing discourse reveals certain disparities between the assertions and substantiating evidence put forth by climate scientists, and the narratives propagated through media channels, by politicians, and among ordinary individuals. Language assumes a pivotal role in this context [1]. This paper aims to explore diverse linguistic and discursive elements frequently employed in discussions on climate change and how teaching helps in this. Initially, the topic will be approached by examining various linguistic representations and subsequently, there will be adopted a more discursive perspective asserting that the concept of storytelling or role-playing can help to a better comprehension of the multifaceted narratives constructed around this issue.

Climate encompasses the dynamic interplay of the atmosphere, biosphere, hydrosphere, cryosphere, and lithosphere considering terminology, while weather pertains to short-term fluctuations, climate change signifies a prolonged and sustained alteration in climatic conditions. As human-induced greenhouse gas emissions persistently store heat in the form of infrared radiation, global warming

has been manifesting at an unexpectedly accelerated pace, with its impacts being palpable across the globe. Initially, in 1966, the World Meteorological Organization employed the term "climatic change" to encompass all forms of climatic variations occurring on timescales surpassing 10 years, irrespective of their origin being natural or anthropogenic. However, as it became evident that human activities possess the ability to profoundly modify the climate, the term "climate change" emerged as the prevailing phrase, reflecting an anthropogenic causation [2].

One of the topic questions discussed in this paper will be related to education about climate change. Education constitutes an indispensable component of the global response to climate change. It aids young individuals in comprehending and addressing the repercussions of global warming, fosters changes in their attitudes, and facilitates adaptation to climate change-related trends. Climate change is arguably one of the most contentious global issues of the past five decades, and the implementation of climate change education, akin to other forms of environmental education, has proven to be a challenging endeavor. Therefore, this paper can contribute to the compendium of strategies that can be adopted, with a specific emphasis on the roles universities, schools, and communities can play in this regard.

2 Research Background / Ongoing changes in climate conditions, and the prevalence of natural disasters

This requires immediate actions to be taken in order to be resilient. Climate change poses a global natural danger, with instances where such hazards escalate into full-fledged disasters, necessitating education concerning catastrophe risk reduction and resilience for affected populations. A natural hazard only transforms into a disaster when the absence of mitigation measures, such as earthquake-resistant structures, becomes apparent. It is crucial not to succumb to the devastating consequences of disasters or perceive them as outstanding and tenacious events that disrupt normal progress.

According to the World Meteorological Society, the second risk, out of 5, that is putting the world in danger are natural disasters and extreme weather events. In 2020, 200 million people were affected and this caused 171 billion dollars of damage. These events are most likely to happen today than 50 years ago [3] (<https://fb.watch/kS4NfOPU2b/?mibextid=Nif5oz>).

Referring to changes of climate throughout the world, it became starkly evident during the recent summer in Australia. The country faced not only one of the most severe droughts on record but also an unprecedented early onset and prolonged bushfire season, extending into March 2020, commonly referred to as the Black Summer. These wildfires have significantly altered Australians' perception of climate change. The rising temperatures in the country, both on land and in the surrounding oceans, are undeniable, even for climate change skeptics. In 2019, Australia experienced the three hottest December days ever recorded. Moreover, the drought continues to afflict vast regions of the continent, and in 2020, the Great Barrier Reef suffered its most extensive bleaching event to date. Despite these realities, Australian politicians, mirroring counterparts in many other nations, persistently avoid taking action on climate change and instead pursue an agenda centered on fossil fuels. Furthermore, they increasingly sideline climate change in educational curricula. The repercussions of such actions extend beyond Australia, impacting the entire planet [3].

In a recent interview, Noam Chomsky, an American intellectual known for his contribution in linguistics, political activism, discussed the urgent need to address the climate crisis and the lack of a sense of urgency among political leaders. He highlighted the severity of the situation, stating that we are at a point where irreversible processes will be set into motion, leading to decline and disaster. Chomsky argued that the institutional structure of capitalism makes it difficult to address the climate crisis effectively. He pointed out that in order to stop the destruction of the planet, the rich and powerful must be bribed to cooperate, which he described as savage capitalism (<https://truthout.org/articles/noam-chomsky->

[there-are-signs-of-hope-amid-climate-crisis-bank-failures-and-war/](https://truthout.org/articles/noam-chomsky-there-are-signs-of-hope-amid-climate-crisis-bank-failures-and-war/)).

Shifting our focus to Albania, our country is prone to various natural disasters, including floods, earthquakes, landslides, and droughts. While earthquakes are not directly attributed to climate change, the effects of climate change can exacerbate the consequences of such disasters. For instance, heavy rainfall and alterations in precipitation patterns can heighten the likelihood of landslides and flooding. Albania has witnessed devastating earthquakes in recent years, resulting in significant loss of lives and extensive damage to infrastructure. Although earthquakes are not directly caused by climate change, they serve as a reminder of the nation's vulnerability to seismic activity. Additionally, climate change can contribute to the occurrence of extreme weather events like droughts, storms, heat waves, etc. which can have profound impacts on communities and ecosystems (<https://documents.worldbank.org/en/publication/document/reports/documentdetail/099430106142216471/p172145046dbf40a5093060a6deca58f620>) What becomes apparent is that climate change disrupts the distinctness and predictability of seasons. The seasonal transition may become less clear, or weather patterns associated with specific seasons may occur at different times or be less predictable.

2.1 Approaches of Climate Change Education

Teaching climate change in university settings plays a critical role in raising awareness, fostering understanding, and inspiring action among students. Climate change education (CCE) is fundamentally settled in the principles of education for sustainable development (ESD) as outlined by UNESCO in 2015. The primary objective of CCE is to involve various stakeholders in promoting lifelong education for citizens around the world and to contribute to the development of a knowledge society in which local populations act on recommendations. CCE intersects with both environmental education and disaster risk reduction and resilience education, two fields that have faced challenges in finding their place within educational institutions' curricula and practices. Despite environmental education being on the international agenda of education since the 1972 United Nations Conference on the Human Environment, and disaster risk reduction and resilience education gaining prominence since the World Conference on Natural Disaster Reduction held in 1994, their integration has not been fully realized. The guiding documents in this context are the Sendai Framework for Disaster Risk Reduction 2015-2030 and the Comprehensive School Safety framework by the United Nations Office for Disaster Risk Reduction.

Past efforts to incorporate CCE within education systems have primarily focused on teacher education or the implementation of a school-wide approach. However, teachers and schools are not the sole actors in education.

Important stakeholders such as educational policymakers, researchers, teacher education institution executives, students and administrative staff, must collaboratively work towards a sustainability-oriented paradigm shift. Ferreira [4] refers to this approach as a "Whole-of-System Model," where all elements of the educational system actively participate in embedding new curricula, policies, or addressing specific contextual needs [5].

Overcoming the challenge of catering to the entire education system has long been recognized as a tension affecting environmental and sustainability education in both pre-service and in-service teacher education. Graduate schools of education are hotspots for pre-professionals and experts from a variety of educational jobs. Implementing a CCE curriculum that makes collaboration easy among these diverse stakeholders would foster peer-learning and cooperation, incorporating a wide range of perspectives and creating a model of a whole-systems strategy. In order to comprehensively integrate the existing knowledge on educational institutional change, a student-led curriculum concept was explored through a framework that analyzes the process of educational change from five perspectives: cultural, psychological, professional, institutional, and political [6].

The classroom is regarded as an ideal starting point for a sustainable climate change mitigation strategy, both short and long-termed. Nevertheless, CCE has sometimes been criticized as a tool to advance the discourse of climate alarmists. Given the intricacies and uncertainties inherent deep in climate change discourses, this is predictable considering the layperson's view of hot discussions over whether climate change is occurring or if human-induced climate change would have a definitive influence on society and the economy. Unluckily, the intricate nature of climate change science hinders a comprehensive understanding of the phenomenon. This is compounded by the challenge of interpreting global changes while attempting to make sense of local environmental changes. Moreover, the observable impacts of climate change over the short term often elude the public's perception. Moreover, ethical considerations play a significant role in climate change discourse, revolving around responsibilities and accountability. Learning about issues related to climate change does not require subscribing to only one side of the alarmist-contrarian opponents. Actually, the underlying concept that should drive climate change education should be that our children are guardians of our shared environment, and that they have a responsibility to critically engage in the issue and act on decisions that are well-informed [7].

The conceptual framework also considers various domains of climate change issues, encompassing causes, impacts, and management aspects. Bringing together these different aspects, a comprehensive framework has been developed that encompasses the three dimensions of climate change discourse: domain knowledge, cognitive engagement, and affective engagement. CCE aims to help learners increase their understanding, skills, values, and

actions to understand the causes, impacts, and management of climate change, nurturing their capacity to comprehend, act, and embody the climate change issue. The framework outlines the potential for students to acquire knowledge, apply skills such as analysis and assessment, take a stance, and act in order to address environmental challenges.

Furthermore, there is a compelling argument for the subject of geography at schools that should serve as a key avenue for integrating the approaches of environmental education, education for sustainable development, and climate change education. While the subject matter remains consistent, geography as a discipline enables the holistic teaching of these approaches within the school curriculum [8].

2.2 Equipping Teachers for Effective Instruction on Climate Change"

In order to effectively apply the CCE (Climate Change Education) framework, the preparation of teachers plays a vital role, considering that CCE is not typically taught as a standalone subject in most educational systems. A review of existing literature reveals that climate change is often incorporated within the methods course as an element of teacher education programs [9]. Research suggests that one approach to adequately prepare teachers for teaching climate change is to equip them with accurate information and teaching methods that facilitate students' critical thinking skills development. Actually, teachers should assist students in comprehending the intricate nature of climate science, enabling them to adopt a critical mindset when analyzing and evaluating mitigation and adaptation strategies and involving them in social and scientific debates. Refutation instruction, introduced by Chang and Pascua and further elaborated by Chang, Pascua, and Ess [4], presents a valuable pedagogical approach to address climate change misinformation. Apart from fostering the right knowledge and profound understanding, teachers should promote responsible actions and inclusivity by encouraging students to be part in societal, scientific, ethical, political, and personal discourses. Ultimately, teachers should encourage students to recognize themselves as participants in the planet's ecological future.

When considering how to teach climate change, teachers often focus on promoting behavior changes aimed at mitigating climate change. However, few teachers are able to implement the most effective teaching methods and pedagogical strategies for this issue. Consequently, it is imperative for teachers to possess a solid understanding of what and how to teach a topic before entering the classroom [11].

Mass media and public debate are often cited as influential sources of informal learning for students. Additionally, due to limited curriculum time dedicated to climate change, students frequently rely on mass media and, at times, social media, as readily available sources of information. This is extremely concerning, as news and

social media coverage tends to be sensationalized, and students rarely confirm or verify assertions made on personal blog sites., for instance. Undoubtedly, the impact of informal education in enhancing children's understanding of climate change should not be neglected.

2.3 Examining Climate Change through Dual Lens: Psychological and Professional Insights into Student-Led Curricula"

A psychological viewpoint emphasizes the importance of understanding how individuals learn for the process of improving teaching and learning for students, teachers, and others who support instruction [6]. Therefore, educational materials must be carefully planned, with particular modifications to behavior to be considered from the very beginning. It is not sufficient for students to learn theoretical notions; they must also be ready to behave in practical and complicated situations. This indicates that educational activities should aim to create certain abilities that promote long-term behavior [11].

Wiek [12] summarizes by outlining five key competencies for education on sustainable development. These competencies include systems-thinking, anticipatory, normative, strategic, and interpersonal competencies. By combining these competencies, it is possible to enhance understanding, problem-solving, and collaboration toward achieving sustainability goals.

Climate disinterest exists, and students frequently do not see an urgency to study or attend a course on climate change. Kasser and Ryan (1996) suggest four sorts of intentions that move people toward a particular objective. Students might be inspired by both extrinsic and internal motivation. Hungerford and Volk (1990) emphasize the necessity of creating a personal relationship to nature and taking responsibility for an issue in order to generate internal motivation and a connection to the environment. When components of CCE are perceived to convert into highly useful features in the workforce, extrinsic motivation can be fostered.

Teachers are a crucial pillar in CCE, as they are fully responsible for the teaching and learning process, observed from a Professional Perspective of a Student Led Curriculum for CCE. In addition, there is an increasing demand in research and practice in students as partners' through jointly developed learning and teaching. This reciprocal link frequently leads to improved academic results and skill development for students. Furthermore, the latest innovations in education and successful pedagogies must be interwoven throughout the planning of competency-driven curricula [7].

3 Methodology

The methodology used in this particular context bears resemblance to the simulation-based learning method

previously mentioned, albeit with additional considerations specific to the development of language skills. This is a qualitative research and the teaching approach accommodated here is "Mantle of the Expert", commonly used in educational settings which involve creating a fictional context where students take on the roles of experts or professionals in a particular field. This scenario allows students to delve into complex problems by working collaboratively and the teacher in this case acts as a facilitator and a mediator guiding and supporting them during the process.

Presented below is an overview of the methodology and research techniques employed:

The most important is role-play simulation methodology: Scenarios were devised to necessitate extensive communication, research, and analysis on the subject of climate change, thereby prompting students to actively partake in discussions, debates, and negotiations while employing language skills pertinent to the field. Hence, role assignment, where students were allocated roles to ensure their active engagement in discussions, debates, and negotiations, utilizing language skills tailored to the respective domain were called upon. Language Support is a key element. Linguistic resources, such as vocabulary lists and reference materials were provided to students in order to augment their comprehension and utilization of climate change terminology. The facilitation and mediation process involved guiding students in utilizing appropriate language, structuring arguments, and effectively articulating their ideas during discussions and debates. After their engagement in these tasks, feedback and evaluation was provided for them: Constructive feedback was provided to students concerning their language usage, encompassing aspects such as grammar, vocabulary, coherence, and clarity, thereby assisting them in enhancing their linguistic proficiency.

Several research methods were employed for the development of linguistic skills, such as language resources: This language resources are specifically tailored to climate change, such as glossaries, academic articles, and speeches, to support students in honing their linguistic prowess. In addition, language proficiency assessments, in which pre- and post-assessments were conducted to gauge students' linguistic skills in terms of vocabulary, syntax, and communicative effectiveness both before and after engaging in the role-playing exercises were conducted in the process.

Language analysis which includes students' language usage during the role-playing activities was scrutinized, with a focus on the application of climate change terminology, employment of argumentation techniques, and implementation of persuasive language strategies. Language training was a fundamental element. Alongside the role-playing activities, workshops or sessions were conducted to provide language training that specifically addressed linguistic challenges pertaining to climate change discourse, such as scientific terminology or policy discussions.

The overarching methodology tries to cultivate an immersive and interactive learning environment wherein students actively employ and refine their language skills within the realm of climate change. By means of role-playing simulations, students actively participate in genuine language utilization, including dialogues, negotiations, and convincing assertions, thus nurturing their ability to communicate proficiently and eloquently in this domain.

The teaching of climate change in universities is heavily influenced by rhetoric and discourse, as elucidated below:

Framing and Narrative is an obvious component, as discourse analysis facilitates an examination of how climate change is framed and narrated in diverse contexts. Instructors scrutinize and investigate the language, metaphors, and narratives employed in teaching materials, public discussions and media representations. By comprehending these discourses, professors can identify predominant perspectives, biases, and potential knowledge gaps, subsequently opting for alternative frames and narratives that augment students' comprehension and foster critical thinking.

Critical Thinking and Debates is also a key element: In climate change education, rhetoric and discourse analysis build critical thinking skills. Professors urge students to assess information and critically evaluate ideas, and participate in conversations about climate change issues.

The incorporation of rhetoric and discourse analysis into the teaching of climate change in universities has the potential to enrich students' understanding, engagement, and capacity to critically evaluate climate-related issues. It helps students to actively contribute to addressing the challenges posed by climate change and nurtures a deeper appreciation for the influence of language and communication in shaping public attitudes and actions. This mediation will also help in fostering and increasing students' lexical knowledge.

3.1 Discussion and Analysis of Findings

This research was conducted during 2022-2023 academic year, when 3 different sessions of workshops (each of them lasted for quite three months) were organized in English with students of the University of Tirana. There were approximately 100 students divided into three groups that discussed about issues related to climate change by taking into consideration one aspect or element of how climate change influences. All the cases that have been investigated and analyzed, refer to Albanian context.

The 1st group had to discuss about protective measures taken for one of UNESCO's heritage sites, which is in danger of collapse. Zogu's Bridge, built in 1927 in Northern Albania, was in terrible condition when it was added to the list of the 7 Most Endangered inheritance monuments in March 2022; however, its state deteriorated considerably after a severe flood in November 2022, when a pier supporting the bridge settled even deeper, posing a serious risk of collapse. Students had to explore a wide range of

words and collocations used in this context, in order to increase their lexical knowledge. Discussing protective measures taken in this situation was also achieved by role-playing and students were supposed to assume the role of experts in that field.

The 2nd group was given a topic idea regarding another implication of climate change which impacted Durrës, the terrible earthquake that stroke this city in 2019 which caused approximately 3000 injured people and 985-million-euro damage (according to the Republic of Albania Council of Ministers). By analyzing the related text, they were assigned to build a corpus of new words and terms that enriched their lexical vocabulary related to that field.

The 3rd group's topic idea was related to Butrint, one of the most important archeological sites in the country, which is deteriorating due to the lack of good management. Many aspects of climate change are a concern at Butrint, including severe temperatures with the potential for both wildfires and drought, but by far the most significant is the rising sea level (according to UNESCO World Heritage Convention, <https://whc.unesco.org/en/soc/1256/>). Students were asked to prepare a certain mini-dictionary of related terms that would be used in their final report. They were also given some relevant terms by the instructor, beforehand.

When assessing students' readiness to learn about climate change, unfortunately, it becomes evident that there are gaps in their comprehension of the subject matter. While students generally express concerns about climate change, they tend to exhibit hesitancy when it comes to taking action. In fact, they are at odds about urging their peers to embrace environmentally friendly activities. Although some claim to consciously reduce energy consumption, such actions are often influenced by habits or parental control rather than a genuine commitment. Students who are not interested in learning about climate change are more inclined to believe that their individual actions will have no significant impact on the planet. This observation also aligns with Trumper's (2010) findings, which highlight the lack of concern among students regarding environmental issues, including climate change. At the end of the sessions of the workshops it was evidenced that students had mastered their lexical background related to the topic and also had increased their awareness about the importance of their contribution to the environment.

Sometimes teaching climate change is perceived as a challenging task, mainly considering the ongoing debates surrounding it and the prevalence of misconceptions among students. Both students and teachers try hard to grasp the complex concepts associated with the subject matter. While teachers identified a lack of subject matter knowledge among students, they also highlighted the dearth of teaching resources and professional development opportunities. Additionally, it is noted the ambivalence of students toward the subject and emphasized the absence of support from students' families in sustaining and reinforcing positive environmental actions.

"In this context, it is necessary to adapt the curricula and further elaborate upon them.". Formal curricula may serve as a way of linking knowledge, understanding, beliefs, and action for students. The Comprehensive Climate Education (CCE) framework provides a way of progress and improvement, enabling students to move beyond mere knowledge recall and engage in evaluation and action.

3.2 Reflection and validation

The research conducted on climate change implications in education, focusing on three UNESCO heritage sites in Albania, provides valuable insights into the challenges faced by these sites and the necessary measures to mitigate climate-related risks. By integrating and mixing discussions, role-playing, and corpus-building activities, students' lexical knowledge and understanding of climate change impacts were strengthened. At the end of each session, each group had to write a report related to their findings, which included recommendations, conclusions, discussions, lessons learned, etc. Actually, not only the instructor but even the students themselves were surprised by the new knowledge they gained in that field. They were unaware of the things they realized after their discussions. Their biggest benefit was related to their vocabulary, totally enriched with new expressions, terms, and collocations, suitable to be used in the previously mentioned contexts (Some of them included: *Mitigate climate change; Reduce greenhouse gas emissions; Tackle environmental degradation; Promote sustainable practices; Combat global warming; Address climate-related risks; Adapt to changing climate conditions; Implement climate policies; Greenhouse effect; Carbon footprint; Deforestation; Climate variability; Extreme weather events; Sea rise level; Climate resilience; Monitor climate patterns; Biodiversity loss* etc.).

As part of the validation, it is fundamental to mention the new "skills" gained by them, which includes, having a clearer and broader understanding of precautions taken before the collapse of famous archeological sites (and not only) because of climate change. This research emphasizes the importance of addressing climate change through education to foster environmental consciousness and preserve our cultural heritage for future generations.

4 Conclusion and recommendations

Climate change is a worldwide phenomenon nowadays. It refers to long-term changes in the Earth's climate system, such as precipitation, temperature patterns, sea levels, and extreme weather occurrences. These changes are mostly the result of human activity. Climate change has a wide range of effects that may be seen all across the world. These include more intense and frequent heat waves, shifting rainfall patterns, higher frequency of droughts and floods, rising sea levels, biodiversity loss, and ecological

disruption. These changes have far-reaching consequences for human civilizations, ecosystems, and the economy, impacting areas such as infrastructure, agriculture, public health, water resources etc.

Teaching climate change through role-playing (and not only) in universities can be an excellent technique to improve students' linguistic abilities in that topic. It allows students to participate in discussions, debates, and negotiations about climate change, which helps them develop their communication, argumentation, and critical thinking abilities. The incorporation of rhetoric and discourse analysis into the teaching of climate change in universities has the potential to enrich students' understanding, engagement, and capacity to critically evaluate climate-related issues. It helps them to actively contribute to addressing the challenges posed by climate change and nurtures a deeper appreciation for the influence of language and communication in shaping public attitudes and actions.

In summary, teaching climate change in universities in the same time is also essential for raising awareness, fostering understanding, and motivating action among students. Climate change education, rooted in education for sustainable development, aims to engage multiple stakeholders and promote lifelong learning for global citizenship. Integration of climate change education within the education system requires collaboration among various actors, transcending the focus on teachers and schools alone. A comprehensive approach is needed to incorporate cultural, psychological, professional, institutional, and political perspectives. By incorporating a student-led curriculum and emphasizing moral responsibility to the environment, climate change education can provide learners with knowledge, skills, values, and actions to address the causes, impacts, and management of climate change. A general appeal should be made, for greater climate change education to be included in the formal curriculum. Geography education can serve as an avenue for integrating environmental education, education for sustainable development, and climate change education within the school curriculum. What is more, CCE, except for increasing students' lexical and terminology, makes them conscious of the importance of climate change and their humble contribution to preventing or at least, minimizing its side effects.

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