

**Sustainability in African Higher Education Institutions
and the influence of language in achieving sustainable development**

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Abstract

This thesis deals with sustainability in African Higher Education Institutions (HEIs) and the influence of language in achieving sustainable development. Several authors highlighted the existing imbalance of sustainability research in higher education, with most publications focusing on the so-called Global North. Little is known about sustainability in the so-called Global South, and in African educational institutions in particular. The first article of this thesis investigated existing sustainability activities in African HEIs. Rather than focusing on the shortcomings, the paper took a positive stance, opposing the predominant language of deficits in research on Africa. In the Delphi study conducted, 32 experts from 29 HEIs in 16 African countries described the sustainability activities they are engaging in. Experts provided information about their experiences in their respective HEI, while language and culture emerged as areas in need of further research. The second article therefore focused on the relationship between language and education for sustainable development in African educational institutions, and systematically reviewed scholarly literature regarding this connection. Authors of the reviewed 33 papers approached this connection mainly on a theoretical and philosophical level, focusing on education and Africa as a whole rather than specified forms of education in specific countries. The third article examined the views of Tanzanian higher education students and graduates regarding language and sustainability. Participants explained how they integrate sustainability and the Sustainable Development Goals (SDGs) into their research and how they approach translations in the process. In the ensuing interviews, participants estimated that only a fraction of people outside of academia are aware of sustainability and the SDGs, rendering the achievement of target 4.7 unlikely. This thesis therefore contributes to a better understanding of the current challenges in implementing sustainability and the SDGs in African educational institutions. It highlights the need to integrate (local) African languages in order for sustainability activities as well as the SDGs to be successful, and to keep the pledge to leave no one behind.

Keywords: Sustainability, Sustainable Development Goals, Africa, Higher education, Language, Swahili

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1. Introduction

Less than seven years remain to achieve the 2030 Agenda for Sustainable Development. Both the Decade of Education for Sustainable Development from 2005 to 2014 and the introduction of the Sustainable Development Goals (SDGs) in the year 2015 raised awareness on matters related to sustainability. Yet, much remains to be done to achieve sustainability in practically all spheres of life. Goal number four of the SDGs specifically highlights the importance of education and aims to ensure “inclusive and equitable quality education and promote lifelong learning opportunities for all” (UNESCO, 2015, p. 7). Education for Sustainable Development (ESD) plays a pivotal role in achieving the SDGs (UNESCO, 2017) and is therefore closely linked with quality education. As stated in the second paper, ESD is defined as a lifelong learning process which “empowers learners to take informed decisions and responsible actions for environmental integrity, economic viability and a just society, for present and future generations, while respecting cultural diversity” (UNESCO, 2018, p. 4). While UNESCO’s definition states *what* the process of ESD entails, it does not elaborate *how* the necessary knowledge can be successfully imparted. The negligence of this *how* was criticized by numerous authors (Mweri, 2020; Toboso & Kandagor, 2018; Ouane & Glanz, 2010) because education contains the transmission of knowledge through some form of language, in either spoken, written or sign form.” (Ulmer & Wydra, 2022, p. 3).

Educational institutions therefore play a major role in “instilling behavioral changes for sustainable development” (Palmer 2013, p. 303). In this regard, higher education institutions (HEIs) are among the adequate places to implement sustainability activities, both because of their own effects on the environment and because students educated in HEIs are likely to hold influential positions later in life (Lozano, 2006; Cortese, 2003; Orr, 2004). Educating those future change agents in matters of sustainability is therefore of immense importance for future global (un-)sustainable developments. However, various authors noted the existing imbalance of sustainability research in HEIs in the so-called Global North compared to HEIs in the so-called Global South, and in Sub Saharan African in particular (Okebukola, 2017; Darkwa & Edjah, 2016). Therefore, little is known about existing sustainability activities in African HEIs, since scholars mostly focused on what Africa is not instead of what it is (Lotz-Sisitka, 2011).

Furthermore, progress reports on the SDGs by the United Nations (UN, 2022) indicate that factors such as the ongoing Corona pandemic (Leal et al., 2021; Fagbemi, 2021), data constraints (UNESCO, 2020; UNDP, 2016) and inequities in funding (IPCC, 2022) are slowing down the implementation of the SDGs. Other constraining factors remain overlooked: while the importance of language in education is well established (Wolff, 2006), the role of language as a prerequisite to achieving the goals set in development agendas such as the Millennium Development Goals or the SDGs is largely ignored (Toboso & Kandagor, 2018; Romaine, 2013). Against the backdrop of all these challenges, Twinoburyo et al. (2019, p. 8) highlighted that the SDGs are “unlikely to be met if rapid and unified action is not taken”. Implementing sustainability activities in (higher) educational institutions and achieving the SDGs until the year 2030 therefore remains challenging.

The aim of this paper-based dissertation is to investigate the existing sustainability activities in African HEIs, and approaches the topic by gaining insights into the experience of African scholars working in sustainability matters on a daily basis. Building on these findings and emerging themes, the connection of ESD and language is investigated, both theoretically by using a systematic literature review and practically in a case study. However, while this thesis delivers insights into the current state of sustainability in African HEIs and the importance of language, ESD remains a complex and comprehensive topic of research. The author therefore does not pretend to “have exhausted the analysis of the links between language and education for sustainable development” (Kamwendo, 2009, p. 2). This thesis’ aim is rather to shed light on this topic, which major institutions do not sufficiently integrate in their development activities (Footitt et al., 2018), and gives practical insights into the state of sustainability in different African countries. The following segments present the structure of this thesis, the problem statement, the contribution to knowledge and importance to sustainability science, reflections on the role as a researcher as well as the conclusion.

2. Structure of this thesis

This paper-based thesis consists of three peer-reviewed articles, published in the two journals *International Journal of Sustainability in Higher Education* and *Journal of Contemporary Issues in Education*. Each article examines a different aspect of the research topic *Sustainability in African Higher Education Institutions and the influence of language in achieving sustainable development*. The topic is approached by first investigating the status quo as experienced by scholars working in sustainability in African HEIs. After establishing the emerging themes of language and culture in the first paper, the focus in the second and third paper lies particularly on the connection of ESD and language: Whereas paper two approaches existing scientific research by using a systematic literature review, paper three illustrates the connection via a case study in a Tanzanian HEI by interviewing students and graduates. The thesis therefore investigates sustainability activities on the continental level in Africa, and breaks it down to the country level using the example of a Tanzanian case. The research questions leading this thesis are stated in the following:

- What are insights from experts in African HEIs about the current sustainability activities in their respective HEI?
- What is known about the connection of language and sustainable development in scholarly literature in an African educational context, and what are the recommendations for future research in this field?
- How do Tanzanian students and graduates include sustainability and the SDGs into their research, how do they approach translations in the process and what are their experiences regarding the awareness of both concepts in communities outside of (higher) education institutions?

Figure 1 illustrates the approach chosen in this thesis. This introduction article (“Rahmenpapier” according to the *Richtlinie zur kumulativen Dissertation, beschlossen am 15. Januar 2012 (Dr. phil.)*) builds the foundation of the following three published articles. The three papers are attached as Annexes 2, 3 and 4, respectively.

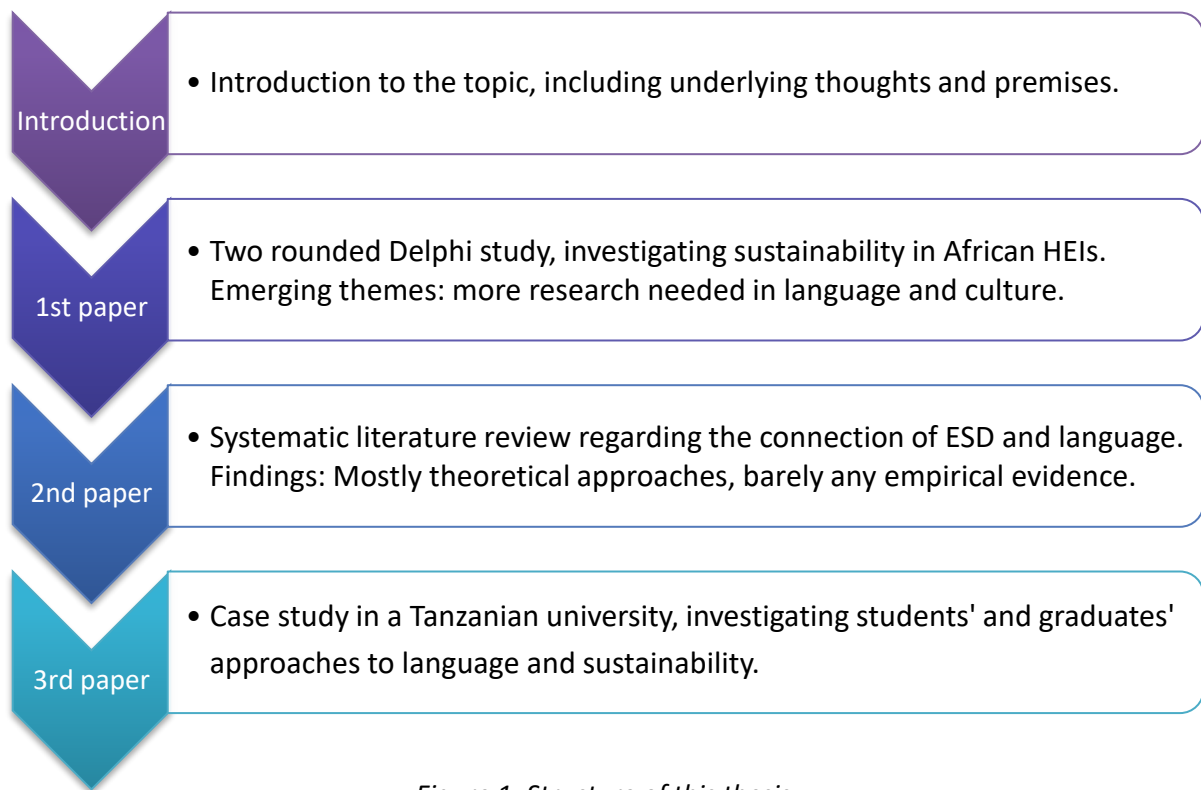


Figure 1: Structure of this thesis

3. Problem Statement

In this section, the problem is defined. As stated in the second paper of this thesis, the “underlying theoretical assumption of this study builds upon Ayo Bamgbose’s (2011, p. 4) paper ‘African Languages Today: The Challenge of and Prospects for Empowerment under Globalization’, in which the author notes that ‘only a small part of the populace can be involved in a development strategy based on the use of an imported official language’” (Ulmer & Wydra, 2022, p. 3). Other scholars, like Djité (2008), similarly argued that marginalizing a people’s language means practically denying them the chance to actively engage in the development process. This denial of active engagement manifests in matters of sustainable development and the SDGs as well. Litre et al. (2022, p. 11) concluded that “participatory discourses will continue to be empty” in the Global South unless these language barriers are addressed, while McEntee-Atalianis (2018, p. 6) argued that missing to address language issues will “almost certainly” lead to failure of development policies.

The historical and current neglect of addressing these language barriers particularly affects the average citizen (Abdulai et al., 2018), meaning the majority of people in African countries

who have no connection to academia and no sufficient knowledge of their country's official language. Estimates of the number of African people in different countries who have a grasp of languages like English, French or Portuguese vary between five and twenty percent (Djité, 2008; Ouane & Glanz, 2010; Pawliková-Vilhanová, 2018). In Tanzania, both English and Swahili function as official languages. However, the mastery of those language differs widely. Different authors estimated that around five percent of the Tanzanian population speak English (Skattum & Brock-Utne, 2009), whereas estimates of Tanzanians speaking Swahili range between 90 and 99 percent (Arthur, 2021; Alidou & Brock-Utne, 2006). English was therefore labeled as a minority language in Tanzania (Tibategeza, 2010).

It is therefore crucial to involve the linguistic sphere for enabling participation of the average citizen in development, and therefore fostering the successful implementation of the SDGs. However, language was described as “one of the most underestimated and under-researched” parameters of sustainable development (Wolff, 2016, p. 44), and remains to be ignored by major global and national institutions and their development activities. Target 4.7 of the SDGs, and similarly target 12.8, aim to ensure that by the year 2030, “all learners acquire the knowledge and skills needed to promote sustainable development, including [...] through Education for Sustainable Development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and nonviolence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development” (UNESCO, 2017, p. 2). Target 4.7 focuses on reaching all learners, but is bound to fail if language is further neglected in communicating the SDGs. Yet, little research exists that empirically investigates this connection.

4. Contribution to knowledge

This section outlines how each paper contributes to scientific knowledge, and is divided into the three papers (1st) investigation of sustainability in African HEIs, (2nd) the literature review regarding the connection of ESD and language and (3rd) the case study in a Tanzanian HEI, interviewing Tanzanian students and graduates. Overall, this thesis contributes to the sparsely researched topic of sustainability in African HEIs (Okebukola, 2017) with a focus on the linguistic dimension, approaching the topic both on a theoretical and empirical level as well as from the continental to the national level.

1st paper: Sustainability in African higher education institutions (HEIs): Shifting the focus from researching the gaps to existing activities

This first paper explored the sustainability activities taking place in African HEIs. It presents the emerging challenge of language and culture when implementing those activities and highlights the need to build upon existing activities rather than criticizing the lacks of activities. According to Linstone and Turoff (2002, p. 4), a Delphi study is an appropriate research method when the “problem does not lend itself to precise analytical techniques but can benefit from subjective judgments on a collective basis”. Skulmoski et al. (2007, p. 1) similarly described the Delphi method as “well suited as a research instrument when there is incomplete knowledge about a problem or phenomenon”. To the author’s knowledge, there exists no similar study regarding sustainability in African HEIs to date. A study by the Global University Network for Innovation, the International Association of Universities and the Association of African Universities (GUNi, IAU & AAU, 2011) deals with promoting sustainable development in African HEIs. The authors contacted 498 HEIs from 41 sub-Saharan African countries for the study, however, without “engaging meticulous criteria” (ibid, p.16). In contrast, the approach of this first paper was a purpose sampling, deliberately aiming to reach those experts engaging in sustainability activities in order to gain a better understanding of the activities and challenges present. The Delphi method therefore allows to draw upon the expertise of experts working in the area of study, namely academics working on sustainability matters in various African HEIs.

Sixty-nine experts from different African countries were contacted and asked to share their experiences regarding sustainability in their respective HEI. Out of those 69 experts contacted, 32 experts from 29 HEIs in 16 African countries participated in the study. In the first questionnaire, respondents were asked about their understanding of sustainability and sustainable development to ensure that the author and respondents share the same definition of both concepts. In accordance with Cortese (2003), the ongoing sustainability activities in the fields of teaching, research, campus operations and community outreach were of special interest. The second questionnaire that followed delved deeper into the topics that emerged in the first round. Results indicated that there are plenty of sustainability activities taking place in African HEIs. The topics language and culture emerged as topics which are researched in dedicated

research centers. However, participants described language and culture in connection to sustainability as neglected areas of study.

2nd paper: The connection of Education for Sustainable Development and Language in African Educational Institutions – A systematic literature review

The focus in this second paper was therefore to explore the connection of language and ESD. Following the findings of the first paper, the initial aim of the systematic literature review was to investigate scholarly literature on the connection of ESD and language in an African Higher Education setting. As stated in the second paper, a systematic literature review aims for “exhaustive, comprehensive searching” and analyses what is known, what remains unknown and gives recommendations for future research (Grant & Booth, 2009, p. 94). However, after working through several databases and search engines with the key words *Africa**, *Sustainab**, *Language* and *Education*, it became evident that there are only few articles investigating this connection. Hence, the scope of the review was broadened to African Educational Institutions with the Keyword *Education*, with HEIs being a subcategory instead of the main category.

Overall, this decision emerged as a useful approach since even after broadening the educational focus, there was a total of 203 papers, of which 33 papers were found dealing with this connection. Out of those 33 papers, there could only be one paper obtained investigating ESD and language in an African higher education context. All the other 32 papers approached the topic in a more generic way, focusing on education and Africa as a whole as opposed to investigating specific forms of education in specified countries. Furthermore, only five of the papers investigated this connection empirically with concrete case studies in Zanzibar or Botswana. The findings of this literature review therefore indicate that this connection is not yet well researched. The predominantly theoretical reflections of scholars may fail to inform decision makers and educational stakeholders, leading to an absence of empirical evidence from linguistic research in educational policies. More than a decade later, Tilbury’s (2011) description of ESD as being poorly researched and weakly evidenced therefore still proves true.

3rd paper: Lost in translation? Tanzanian students' views on sustainability and language, and the implications for the pledge to leave no one behind

Based upon these findings of the majority of authors' theoretical and philosophical approach, the third paper investigated the experiences of Tanzanian students and graduates by using a case study. If we are to understand the status of the SDGs, "it is important to look to research that can illuminate what is happening on the ground, at the local level." (Mbah & East, 2022, p. 2). This third paper investigates a Tanzanian case and builds the interface between linguistics and ESD, representing a largely ignored connection (Wolff, 2006). The paper extends the higher education level and inquires whether people outside of academia, the so-called average citizens, are aware of sustainability and the SDGs.

The paper focuses on the experiences of Tanzanian students and graduates regarding the connection of language and sustainability, and deals with the question how the successful implementation of the SDGs can be fostered. It does so in three steps. First, it embeds the introduction of the SDGs into the overall language in education debate and reveals the three overarching and interconnected themes science, society and government. Second, a questionnaire was administered to Tanzanian students and recent graduates asking for their experiences regarding their research in and with communities, and therefore those people who didn't have the chance or interest to attend higher education. And third, semi-structured in-depth interviews were conducted, delving deeper into students' and graduates' experiences regarding language and sustainability. This approach was chosen since it allowed insights into participants' personal and academic realities.

The analysis of the overall language debate reveals that Tanzanian educational stakeholders, such as parents and students themselves, are in favor of English as the language of instruction, while educational researchers have highlighted the importance of mother tongue education. Being educated in a former colonial language represents a challenge, both in general and for ESD in particular, because the respective subject matter may not be effectively communicated in a language which is not (fully) mastered by both students and teachers. Furthermore, education in a foreign language is associated with the teaching of foreign concepts (van Pinxteren, 2022), leading to challenges in knowledge acquisition because of possibly lacking "familiar

equivalents in the local language and culture” (Cleghorn, 2005, p. 103). When communicated in a foreign language, ESD may fail to reach its target audience simply by being incomprehensible, and/or by using concepts unfamiliar to the target group.

Results of the study indicate that both students and graduates are well knowledgeable in both sustainability and the SDGs, confirming the initial hypothesis of this paper. Looking at the Tanzanian education system, students who are at Master or PhD level were taught in English starting secondary school up to Bachelor studies. Tanzanian students at the Masters and PhD level, therefore, were taught in English between nine and eleven years, respectively. Hence, students are more likely to have heard about sustainability and the SDGs because they were educated longer than the average citizen. Also, students were educated in English and are therefore more likely to come across concepts from the Global North, due to the close historical and educational ties between Tanzania and Western countries (Ismail, 2007). This paper highlights the importance of including language in any outreach activity concerning sustainability and the SDGs, confirming findings by Litre et al. (2022, p. 9) who claimed that “Western sustainability science and norms formulated in foreign languages are seldom ‘psychologically salient’ to engage local actors”. It is therefore vital to reach people in a language they master, possibly via student educators, since otherwise people will not only be left out, but instead will be actively denied the opportunity to partake in developmental activities (Ugwu, 2020; Djité, 2008).

5. Broader importance to sustainability science

The exclusion of people who do not (fully) master former colonial languages from the development process is a challenge in numerous African countries, Tanzania being one of them. The pan-African, non-partisan research network and non-profit company *Afrobarometer* regularly publishes surveys regarding various matters of people in different African countries. Survey results on climate change awareness, for instance, ranged from 31 % in Tanzania up to 83 % of the population in Mauritius (Selormey et al., 2019). To the author’s knowledge, there are no similar research findings regarding the sustainability awareness in African countries. However, arguments by other authors indicate that the awareness of sustainability could resemble the numbers published by *Afrobarometer* regarding climate change awareness:

Manteaw (2012, p. 376) argued that sustainability is “neither seen nor heard of in most of Africa” and in case sustainability is known, this knowledge remains limited to a circle of elites (Jönsson & Bexell, 2021). The findings of this thesis confirm these notions, since estimations by students and graduates regarding sustainability awareness of people outside of Tanzanian academia range between 10 and 20 %.

Against the background of these numbers on climate change and sustainability awareness, the general approach to sustainability communication of actors in academia and international institutions seems in need of an overhaul. The failure to consider the linguistic sphere in development was poignantly summarized by Qorro (in Brock-Utne, 2006, p. 21), arguing that wanting to give “education without considering the medium of instruction is like wanting to give water to a village but not considering the pipes”. Albeit comparing an immaterial good like education to a material good like water, Qorro’s comparison does contain an important approach for sustainability science. Instead of mainly focusing on the content of the respective SDG and target, sustainability actors and scientists need to pay close attention on how to reach the intended target audience. Harding-Esch (2017, p. 8) noted that the “predominance of ‘Northern’ assumptions” within the SDGs possibly makes people perceive the SDGs as unrelatable. That is, if people are even aware of the SDGs’ existence. Kumalo (2017, p. 19) similarly highlighted that “Western conceptions of the sustainability discourse alienate and remove the socio-cultural specificities in sustainability”. In order for people to identify their own needs and for them to be “researched with” instead of “researched on” (Dowhaniuk et al., 2021, p. 1), they need to be reached in a language they understand.

6. “Africa”, the SDGs and reflection of the role as researcher

Part of the title of this thesis explicitly reads “Sustainability in African higher education institutions”. Given the vast dimension of the African continent which consists of 54 or 55 countries, respectively (UN, n.y.; African Union, n.y.), the focus on *Africa* and *African* HEIs could be interpreted as a rather inaccurate or even presumptuous simplification. However, the continental title was chosen deliberately: in the Delphi study of the first paper, experts from 29 HEIs in various African countries participated and shared their experiences. As already stated in the limitations section in the first paper, “a study with participants from 16 African countries

cannot represent the continent as a whole.” (Ulmer & Wydra, 2019, p. 4). Yet, these 16 countries cover the geographical area of Northern, Eastern, Southern and Western Africa. Participating experts are therefore located in countries covering all four cardinal directions of the continent. Furthermore, when submitting a paper to a journal, titles are sometimes limited to a maximum of 20 words, rendering the use of terms other than *Africa* unpractical in this context. Other authors noted that although no single solution could ever be proposed for this enormous continent, some countries do in fact face similar challenges due to their shared colonial past (Teferra & Altbach, 2004; Brock-Utne, 2015). The second paper similarly investigated the issue on a continental level, whereby the third paper concretized the issue with a case study at a Tanzanian university.

Furthermore, the question whether and why the SDGs are the right framework in an African context needs to be elaborated. The SDGs were unanimously adopted by 193 UN member states in the year 2015, however, some years later the SDGs were described as representing a “global affirmation of European values” (SDSN & IEEP, 2020, p. vii). Other authors described the SDGs as “high-sounding concepts crafted in the specialized parlance of development experts” (Ighobor, 2016, p. 41) with no meaning for its target group, namely people on the ground. While a deeper examination of the criticisms of the SDGs is outside the scope of this introduction, the author of this thesis agrees with the UN’s description of the 2030 Agenda for Sustainable Development as being of “unprecedented scope and significance”, and the SDGs’ description as “universal goals and targets which involve the entire world, developed and developing countries alike” (UN, 2015, p. 3). Seneviratne (2022) similarly highlighted that the SDGs created a common language, allowing governments worldwide to use the same terms when tackling developmental challenges.

The SDGs could therefore be seen as a catalyzing force that aligns global efforts in the realm of sustainability, with partial similarities to other development agendas: The African Union juxtaposed the goals of the ‘Agenda 2063; the Africa we want’ with the aims of the SDGs. The Agenda 2063 represents “a shared strategic framework for inclusive growth and sustainable development” on the African continent (UNEP, 2015, p. 10), while its priority areas show substantial similarities with the SDGs (The African Union Commission, n.y.). When breaking it

down from the continental to the national level, the Tanzanian case is of special interest. In a review considering the SDGs' progress, the Tanzanian government expressed its endeavor to achieve "sustainable human development for its citizens" (United Republic of Tanzania, 2019, p. 12), being underlined in documents such as the *Tanzania Development Vision 2025*. The implementation of the SDGs is described as "a catalyst towards the realization of the country's aspirations" (ibid.) and is perceived as supporting already existing development activities. However, this governmental stance might differ from the views of communal development stakeholders, especially since the SDGs are rather unfamiliar to the average citizen.

Furthermore, in accordance with suggestions by Iroulo and Ortiz (2022) and Mohr (2020), the role and subjectivity as a German researcher needs to be reflected. Due to the close historical ties between Tanzania and Germany, dating back to the German colonial period in Tanzania until the year 1919, undertaking research in Africa and in Tanzania in particular, may represent a sensitive issue. Several challenges arise. First, being a German researcher socialized in German culture, the author's identity influenced this research by, for example, choosing the overarching research theme of sustainability in higher education, the questions asked and the way they were phrased, or the terms used in both English and Swahili. In order to minimize this influence, the first paper made use of a Delphi study and used open-ended questions, allowing participants to explain their views rather than prescribing topics from the author's side. For the second paper, personal bias is not seen as a major issue given the systematic literature review was carried out after establishing the topic of sustainability and language in the first paper, but still manifests in the research topic. For the third paper, Swahili was used in the questionnaire and the interviews conducted. This way, communication between the interviewer and interviewees was eased since less information got lost in translation. Using English in the questionnaire and interviews would have resulted in translating from German to English on the main author's side, while on the interviewee's side it would have resulted in translating from Swahili to English. Using Swahili allowed minimizing the loss of information to translations from German to Swahili on the main author's side, and no translations on the interviewee's side because they are fluent in Swahili.

In order to reduce possible mistakes and misinterpretations when analyzing the data in Swahili, native speakers were consulted in case of uncertainties and colloquial language in the questionnaires. Still, the German identity of the researcher may have influenced the research process (Balolage & Kanyanga, 2020). In Tanzania, a country visited by around one and a half million tourists every year before the COVID19 pandemic started in the year 2020, it is not common for most tourists from Western countries to speak more than a basic so-called Hakuna Matata Swahili (Nassenstein, 2019). This linguistic situation leads to a rather unique position of the main author undertaking research in Swahili, possibly influencing participants' perception of the researcher, and was in fact occasionally positively commented upon by participants in the questionnaire and during the interviews for the third paper.

Another issue to be elaborated is the exploitative research activity named parasitic research (Cirhuza, 2020; Smith, 2018), which is seen as a generally problematic approach by different authors. In this sort of exploitative research, scholars from Western countries collaborate with local researchers in the Global South and rely on their networking and data gathering in the process, but miss to subsequently acknowledge or list these local collaborators as co-authors in the published paper. While plenty of discussions and exchanges shaped this thesis, such as presenting the research progress during research colloquia at both the NM AIST in Arusha and the Leuphana University in Lüneburg, the main author did not depend on any local collaborator during data gathering or other parts of the research. The main author is grateful for bilateral exchanges with Ntiokam Divine, his insights regarding translating the SDGs into African languages and subsequently for his contributions to the third paper as co-author. Still, the data gathered and incorporated in the respective paper was published in scientific journals, mainly benefitting the main author and his co-authors. While the second paper was published in the open access *Journal of Contemporary Issues in Education*, people interested in the research results of the first and third paper would have to pay in order to access the papers published in the *International Journal of Sustainability in Higher Education*.

In accordance with the recommendation by Mbah and East (2022), the papers were shared with interested scholars and all participants who expressed their interest to receive the respective study either via email, via academic platforms such as *ResearchGate* or in the

interviews conducted for the third paper. In order to avoid legal issues with the publishing journal, the first paper was shared with participants only upon request. Since the second paper was published open access, sharing the second paper with interested participants of the first and third paper was unproblematic by sending them the link. For the third paper, interviewees were asked whether they are interested in the results of the study once published, which the majority of interviewees confirmed. The paper was subsequently shared via email with these interviewees after publication, again avoiding legal issues with the journal, since the main author is allowed to share the paper within his personal network. The main author therefore avoided collecting data without feeding back the findings to the respective society, though this claim could be critically examined: The Swahili speaking community in Tanzania is unlikely to benefit from papers on educational matters written and published in English in academic journals. The potential beneficiaries of the knowledge generated in the three papers are most likely English-speaking scholars with an environmental, educational or linguistic background, potentially located in Tanzanian and (East) African academic institutions.

It is therefore hoped that this thesis builds another justification for private initiatives, like Nti-okam Divine's, to translate the SDGs into African languages, and underlines the importance of such translation activities in order to facilitate the achievement of target 4.7 of the SDGs. Still, the main author is confronted with the pitfall of publishing in specialist journals using specialized language while reaching a predominantly highly educated audience. Hence, as practical follow-ups from the findings of this thesis, the main author is working on various activities: First, drafting a policy brief in order to provide evidence-based recommendations regarding the communication of the SDGs in the Tanzanian context, in collaboration with a Tanzanian colleague working with development agencies. Second, the author supports some of the interviewees of the third paper in their ongoing research, by supporting their research proposals and proofreading applications for furthering their studies. And third, as an outcome of sending the first paper to the participating experts, the main author advises a Ugandan start-up company in matters of sustainability in higher education, supporting the founder by networking and sharing opportunities to showcase the founder's practical expertise to a larger international audience.

7. Conclusion

This thesis investigated the status of sustainability in African HEIs. As opposed to joining the ranks of unsolicited spokespersons in the African context (Ramose, 1998), this thesis' aim was to investigate scholars' experience in African HEIs regarding the SDGs and ongoing sustainability activities with a focus on the influence of language. It aimed to shed light on this rather sparsely researched topic in the African context in order to foster the implementation of the SDGs. It aimed to do so by speaking with those people dealing with this topic on a daily basis in order to gain deeper insights. The thesis underlines the need for researchers to reflect on their methods when approaching sustainability research, particularly in connection with language. As elaborated in the second paper, authors such as Romaine (2013), Alexander (2003) and Williams and Cooke (2002) "urged educational and linguistic researchers to strengthen their efforts to communicate their findings more effectively to both researchers of other disciplines as well as policy makers and also international funders" (Ulmer & Wydra, 2022, p. 12). However, given those self-critical calls were urged as early as 2002, more work is needed to transfer research findings into practice. A clear indicator for the need to raise awareness is the lack of linguistic inclusion in the SDGs.

Solving the issue of reaching people in their mother tongue remains a complex endeavor. The current neglect of language in sustainability education results not only in miscommunication, but rather in non-communication between academic and societal actors. Findings from this thesis indicate that only a minority of people outside of academia are aware of both sustainability and the SDGs. In the short term, current students, representing soon-to-be graduates joining the workforce, have the unique capability to connect academia and the average citizen, a potential left untapped for sustainability communication to date. In the long term, there need to be ways to connect academic findings with political decisions in order to foster the implementation of the SDGs. This thesis concludes that the topic of language in connection with sustainability, and with the SDGs in particular, remains eerily overlooked by governments as well as major international institutions. As things currently stand, the majority of the SDGs are unlikely to be reached by the year 2030. Targets 4.7 and 12.8 of the SDGs are bound to fail unless language gains visibility in development agendas and people are reached in their mother tongue.

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Annex 1: Signed assurance

Ich versichere, dass alle in diesem Anhang gemachten Angaben jeweils einzeln und insgesamt vollständig der Wahrheit entsprechen.


Nico Ulmer

Annex 2: First Paper: Sustainability in African HEIs

- a) Published paper**
- b) Both questionnaires of the Delphi study**

1. Fachaufsatz:

Ulmer, N. & Wydra, K. (2020). Sustainability in African higher education institutions (HEIs): Shifting the focus from researching the gaps to existing activities. *International Journal of Sustainability in Higher Education*, 21(1), 18-33. <https://doi.org/10.1108/IJSHE-03-2019-0106>

Aufgrund rechtlicher Begebenheiten darf dieser Fachaufsatz nicht in dieser Dissertation veröffentlicht werden. Nachfolgend gelistet sind daher nur die beiden in der Delphi Study genutzten Fragebögen. Der Autor darf Interessierten den Fachaufsatz auf Nachfrage jedoch zur Verfügung stellen.



Section A: Sustainability in different fields

A1. In this study we use the concepts:

- **Sustainable Development** as defined in the *Our Common Future* (1987) report as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

- **Sustainability** according to the Triple Bottom Line Concept and its three interrelated dimensions environment, society, economy.

Do you consider these definitions relevant to your institution?

Yes, we orient our activities on these definitions.

No, the following definitions are more suitable for us:

A2. Is your institution pursuing activities in sustainability in the following four fields?

If so, please tick the appropriate field(s) and elaborate how these activities look like (multiple responses allowed).

Teaching

Research

Campus Operations

Community Outreach

Other field:



Section B: African Elements of Sustainability

B1. Does your institution include elements of your country's traditional African knowledge into its sustainability activities? If so, please elaborate.

(These elements include, among other things, indigenous knowledge, use of a local language as language of instruction, etc.)

No

Yes

Section C: Institutional Information

Please provide some details about your institution.

C1. What is the size of your institution considering student enrolment?

Less than 1000

1001 - 5000

5001 - 10000

10001 - 15000

15001 - 20000

More than 20000

C2. What type is your institution?

Public

Private for profit

Private non profit

Other:

Other:



C3. Are your institution's sustainability activities guided by a special agenda? If so, please name the respective agenda(s).

(**'Special agenda'** refers to programmes such as the Sustainable Development Goals, Declarations on Sustainability in HEIs, Agenda 2063, your institution's own vision, etc.)

No

Yes:

Yes:

Section D: Personal Information

Please give us some details considering your function at your university. Your personal information will not be made public. They will be used for averages and relations [such as relation of female/male respondents] which will not allow to draw conclusions about the respondent.

D1. What is your gender?

Male

Female

Prefer not to say

D2. What is your age group?

20-29

30-39

40-49

50-59

60 and over

Prefer not so say

D3. What is the position you are holding in your institution?

Administrator

Professor

President

Chancellor/ Vice Chancellor

Head of Department



PhD Researcher

Other:

Other:

D4. What is your academic background? (Education, Law, Engineering etc.)

D5. Is there a field in your institution's sustainability activities you personally are mostly engaged in?

(This question refers to the four fields of teaching, research, campus operations and community outreach.)

No

Yes, in the following field(s):

D6. Is there anything else you'd like to tell us?



We thank you for your time and contribution to our study!

Your answers will be reviewed and reflected to you soon.

**In case of feedback or questions, please feel free to contact the researcher
via nico.ulmer@gmail.com**



Section A: Definition of Sustainability and Sustainable Development (SD)

Information considering responses in the first round:

30 of the 32 participants agreed with the presented definitions of Sustainability and SD (2 participants: no response). 11 of the 30 participants commented on this question, also considering the limitations of these definitions, for example when it comes to culture and governance.

A1. This concern is in line with the UNESCO's description of culture as "a driver and an enabler for sustainable development" [1].

Do you agree with the UNESCO's statement? If yes, how do you think culture could be embedded in sustainability initiatives in your institution?

[1] UNESCO (2012): Culture: a driver and an enabler for sustainable development, http://www.un.org/millenniumgoals/pdf/Think%20Pieces/2_culture.pdf (retrieved 20.2.2018)

Yes

No



Section B: HEIs and Sustainable Development Goals (SDGs)

Information considering responses in the first round:

In the question considering the special agenda guiding an institution's sustainability activities, the SDGs have been the most prominent answer among participants (mentioned 12 times) followed by National Development Plans (mentioned 7 times) and the Institution's own vision (mentioned 6 times). Declarations on Sustainability in Higher Education have not been mentioned.

B1. How do you see the role of HEIs in reaching the SDGs?

Not important

Slightly important

Moderately important

Important

Very important

B2. Where do you estimate your institution will have the biggest impacts in supporting the implementation of the SDGs? (Multiple answers allowed)

GOAL 1: No Poverty

GOAL 2: Zero Hunger

GOAL 3: Good Health and Well-being

GOAL 4: Quality Education

GOAL 5: Gender Equality

GOAL 6: Clean Water and Sanitation

GOAL 7: Affordable and Clean Energy

GOAL 8: Decent Work and Economic Growth

GOAL 9: Industry, Innovation and Infrastructure

GOAL 10: Reduced Inequality

GOAL 11: Sustainable Cities and Communities

GOAL 12: Responsible Consumption and Production



GOAL 13: Climate Action

GOAL 14: Life Below Water

GOAL 15: Life on Land

GOAL 16: Peace and Justice Strong Institutions

GOAL 17: Partnerships to achieve the Goals

Not applicable in my institution

B3. In which way are the sustainability activities to reach the SDGs implemented in your institution?

Interdisciplinary

Department based

Mix of both

Other

I'm not sure

B4. Is your institution cooperating with other HEIs to reach the SDGs?

If so, in which fields are these cooperations taking place?

Yes

No



Section C: Drivers and Barriers

Information considering responses in the first round:

Participants' institutions are active in Research on sustainability (mentioned 29 times), Teaching sustainability related courses (mentioned 27 times), sustainable Campus Operations (mentioned 22 times) and Community Outreach (mentioned 22 times).

The field "Other" was checked 5 times and incorporates Student clubs and committees considering sustainability.

C1. What are the main drivers for your institution to engage in sustainability activities?

C2. What barriers do you see preventing your institution from engaging in sustainability activities?

Section D: Institutional Setting

D1. Which approach was applied in your institution to engage in sustainability activities?

Top-down

Bottom-up

Mixed approach

I'm not sure



D2. Is your institution involved in one or more partnerships at regional, national and international level in order to develop sustainability projects?

If yes, please elaborate.

Regional partnerships

National partnerships

International partnerships

Other

There are no partnerships

I'm not sure

D3. Does your institution participate in a network on sustainability, such as the *Global University Network for Innovation (GUNi)*, *Higher Education Sustainability Initiative (HESI)* etc.?

Yes, in the following network(s)

No, we do not participate in sustainability networks

I'm not sure

D4. What do you think are the expectations of the city/surroundings for your university?



D5. Does your institution provide faculty and staff development opportunities to enhance understanding, teaching and research in sustainability?

If so, please describe recent faculty/staff development opportunities.

Yes, the following

No

D6. What use is made of the results of faculty research projects on sustainability/SD?

D7. What use is made of the results of student research projects on sustainability/SD?

D8. Does your institution receive support (such as financial, material, infrastructure etc.) specifically for sustainability and SD activities?

Yes, in the following areas

No, we receive no support



D9. What role do International Funders play in your institution's sustainability and SD projects?

Section E: Outreach and Impact

Information considering responses in the first round:

In the 'Community Outreach' field participants mentioned that creating the link between academia and local communities is essential. This link is sought to be created through awareness raising in different fields (environment, sustainability, health, water conservation), non formal education of rural people and fostering engagement from academics in rural development issues.

It has also been mentioned that the community is integrated into new projects.

E1. Does your institution engage in actively obtaining knowledge from the rural people when implementing new projects?

If yes, what forms do these engagements take?

Yes

No

E2. Do you think the promotion of local languages could contribute to your institution's outreach activities?



Section F: Africanization

Information considering responses in the first round:

19 participants stated that their institution's sustainability activities include elements of their country's respective traditional knowledge, 11 of the participants stated they do not include traditional knowledge (reasons being, for example, that such knowledge is not present in their country; no response from 2 participants). This roughly leads to a relation of 2/3 of participants answering yes and 1/3 answering no.

F1. Is there anything you regard as essential to the *Sustainable University* concept that is currently not being considered?

F2. The Agenda 2063 proposes “An Africa with a strong cultural identity, common heritage, values and ethics” as one of the *Africa We Want* aspirations [2].

Do you think your institution can contribute to this vision? If so, where do you see your institution’s contribution?

[2] African Union Commission (2015): *Agenda 2063 - The Africa We Want*, <http://www.un.org/en/africa/osaa/pdf/au/agenda2063.pdf> (retrieved 25.2.2018)

F3. Considering global inequality and 'the divide' in the world, do you see a role for sustainable universities addressing these issues?

If yes, what would you suggest in this context for your institution?

Yes

No



F4. African Universities have been categorized into the *Classical Universities*, meaning those inherited from former colonial masters, and the *Africanised Universities*, in which the African point of view is crucial.

Fredua-Kwarteng and Ofofu proposed a third model called the *Developmental University*. The authors defined this third model as any university "that focuses on contributing to all aspects of the development of its home country" which includes a transformative pedagogy as opposed to a passive pedagogy [3].

In your opinion, which of these models should be the basis for a sustainable university in Africa?

[3] Fredua-Kwarteng, E.; Ofofu, S. (2018): A better model than the Africanised University, <http://www.universityworldnews.com/article.php?story=20180131112623305> (retrieved 25.2.2018)

Classical University

Africanised University

Developmental University

Other:

F5. In your opinion, is it critical to use the term 'development' for African HEIs, since it is mostly defined from a 'development perspective' of the global North?

F6. Should the structural and historical causes of poverty in the global South be part of the curricula of a sustainable university? If yes, please give reasons.



F7. Do you think there is any 'divide' between African scientists educated in the global North and in their own country?

F8. In your opinion, does Western education prepare African scientists for SD challenges in their respective African country?

We thank you for your time and contribution to our study!

Your answers will be reviewed and reflected to you soon.

In case of feedback or questions, please feel free to contact the researcher via nico.ulmer@gmail.com

Annex 3: Second Paper: Systematic Literature Review

- a) Published paper**
- b) List of reviewed papers for the systematic literature review**

The Connection of Education for Sustainable Development and Language in African Educational Institutions – A Systematic Literature Review

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Abstract

Education for Sustainable Development (ESD) gained global momentum in recent years. However, little is understood about the connection of ESD and language, which has been identified as being among the most underestimated and under-researched parameters of sustainable development. In order to fill this gap, this paper systematically reviews scholarly literature on the connection of ESD and language. Of the 33 papers examined for this review, which exclusively dealt with language and ESD in an African educational setting, the majority took a theoretical rather than empirical approach. Most of the existing research focused on a general educational context, followed by primary and secondary education, and lastly higher education. Almost all authors recommended further research into African languages, highlighting the need to integrate African languages and indigenous knowledge systems in order to support various development agendas. Further neglect of the language factor might otherwise endanger the implementation of the Sustainable Development Goals.

Introduction

Education for Sustainable Development (ESD) gained global momentum in recent years (UN, 2020). While the Decade of Education for Sustainable Development (DESD) from 2004 to 2015 “triggered changes worldwide” (Michelsen & Wells, 2017, p. 8), more work remains to be done “in order to move societies towards sustainability” (UNESCO, 2014, p. 185). Through its research, higher education plays a pivotal role as a driver of sustainability (Leal Filho, 2015). However, various authors highlighted the dearth of sustainability studies in educational institutions in the Global South (Weiss & Barth, 2019) and in Sub-Saharan Africa in particular (GUNi, IAU, & AAU, 2011). Karatzoglou (2013) found no publication from the African continent in the major international journals when undertaking an in-depth literature review considering the contribution of universities to ESD. Manteaw (2012, p. 376) similarly argued that ESD is “neither seen nor heard of in most of Africa”. Thus, further research is needed in areas such as the engagement of higher education staff with ESD (Amado et al., 2017) and the sustainability activities African Higher Education Institutions engage in (GUNi et al., 2011; Ulmer & Wydra, 2020).

Another largely ignored research area within ESD is its relationship with language. Language represents “one of the most underestimated and under-researched” parameters of sustainable development (Wolff, 2016, p. 44). Several authors underlined the importance of language in the development process in Africa (Robinson, 1996; Toboso & Kandagor, 2018; Vuzo, 2018).

These authors highlighted that in many African countries only a tiny fraction of the population is able to speak a former colonial language, which still serves as one or as the only official national language (Negash, 2005). Other authors criticised the generally low priority attributed to languages in the development cycle (Djité, 2008; Ugwu, 2020), ultimately leading to their invisibility (Footitt, Crack, & Tesseur, 2018; Heugh, 2006). According to Erastus (2013) and Prah (2012), this invisibility of languages represents the missing link yet to be acknowledged in both development work (Tilbury & Mulà, 2009) and education (Wolff, 2006).

In order to investigate what is known about the connection of language and sustainable development in African educational settings, a systematic literature review was undertaken. The review's focus lies on the existing scientific literature regarding the connection of sustainable development and language in the African educational context, from primary to higher education. The underlying theoretical assumption of this study builds upon Ayo Bamgbose's (2011, p. 4) paper "African Languages Today: The Challenge of and Prospects for Empowerment under Globalization", in which the author notes that "only a small part of the populace can be involved in a development strategy based on the use of an imported official language". Babaci-Wilhite (2013, p. 1996) concurred that despite the major focus of national and international development efforts to make "the right to education a universal human right", mere access to education proved insufficient. Instead, the "average citizen" needs to understand what is being communicated by choosing both the right language (Abdulai, Kagumire, & Geoghagan, 2018, p. 27) as well as non-scientific language (Franchetti & Knobel, 2018; Van Breda, Musango, & Brent, 2018).

Definition of ESD and the Link to Language

The *Our Common Future* report (Brundtland, 1987, p. 37) defined sustainable as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." ESD is defined as a lifelong learning process which "empowers learners to take informed decisions and responsible actions for environmental integrity, economic viability and a just society, for present and future generations, while respecting cultural diversity" (UNESCO, 2018, p. 4). While UNESCO's definition states *what* the process of ESD entails, it does not elaborate *how* the necessary knowledge can be successfully imparted. The negligence of this *how* was criticised by numerous authors (Mweri, 2020; Toboso & Kandagor, 2018; Ouane & Glanz, 2010) because education contains the transmission of knowledge through some form of language, in either spoken, written or sign form. Brock-Utne (2014, p. 4) described the language of instruction conundrum present in several African countries as "the most important and least appreciated issue" in education, and criticised donors for predominantly focusing on learning outcomes while disregarding the way of achieving these outcomes. Former colonial and now officialised languages (Wolff, 2021) such as English, French or Portuguese still serve as the language of instruction in many African classrooms, leading to the mislabeling of African countries as anglophone, francophone or lusophone (Heugh, 2006; Skattum & Brock-Utne, 2009; Wolff, 2021) instead of afrophone (Brock-Utne, 2014; Wolff, 2016). The rhetoric surrounding the SDGs "stresses inclusiveness, multidirectional communication, and reaching the world's least advantaged citizens" (Marinotti, 2017, pp. 2-3). This inclusive aspiration, however, stands in stark contrast to the missing integration of language into development agendas, which was described as key "to close the gaps and meet key targets" (Romaine, 2013, p. 1). Neither the

Millennium Development Goals (MDGs) nor the SDGs mentioned language as prerequisite to reach the respective goals, which exemplifies the aforementioned invisibility of language.

Research Methodology

Against this background, a systematic literature review was undertaken, aiming to scope the types of papers and the approaches taken in this under-researched field. This paper is informed by prior research and identifies possible future directions of research in order to fill identified gaps (Munn et al., 2018) and to give a contemporary overview of existing research in the field of ESD and language. A systematic literature review aims for “exhaustive, comprehensive searching” and analyses what is known, what remains unknown and gives recommendations for future research (Grant & Booth, 2009, p. 94). This type of research method was chosen since it allows to comprehensively answer the following two research questions:

- 1) What is known about the connection of language and sustainable development in scholarly literature in an African educational context?
- 2) What are the recommendations for future research in this field?

In order to answer these research questions, the following sub-questions were examined:

- What are the institutional affiliations of the authors and in which countries are these universities based, respectively?
- What is the temporal distribution as well as geographical focus of papers published, and was there an increase in research output after the introduction of the Sustainable Development Goals (SDGs) in the year 2015?
- What are the main findings and recommendations of the reviewed papers?
- In case of empirical studies: in which language was the research conducted, apart from being published in English?

And lastly, since no single discipline can claim ESD as its own (UNESCO, 2018), what is the disciplinary background of the journals the papers were published in, and is there a predominant type of journal?

Based on the findings, further possible fields for future investigation are suggested in the conclusion. Articles were obtained through searching for key words in the following search engines and databases, in alphabetical order:

- *African Education Research Database (ESSA)*
- *African Journals Online (AJOL)*
- *Bielefeld Academic Search Engine (BASE)*
- *Council for the Development of Social Science Research in Africa (CODESRIA)*
- *Google Scholar*
- *Science.gov*

These search engines and databases were chosen since they refer to millions of papers in various databases (*BASE*, Google Scholar, Science.gov) as well as explicitly to African Journals (*ESSA*, *AJOL*, *CODESRIA*). Key words entered into the search engines and databases included *Africa* Sustainab**, *Language* and *Education*. The list of references in each obtained paper was screened for further thematically linked papers. Rowley and Slack (2004, p. 33) noted that books can be a “good place to start” a systematic literature research. The book *The*

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<http://ejournals.library.ualberta.ca/index.php/JCIE>

Sociolinguistics of Development in Africa by Pauline G. Djité (2008) is frequently cited in scientific literature and was therefore also read and its list of references screened. In the evaluation of this literature review, however, only peer reviewed papers published in scientific journals were taken into account. Due to their synonymous use in literature (Sartori et al., 2014), emerging search results including “Sustainable Development” and “Sustainability” were both taken into account. The literature search was undertaken in English language.

Because a systematic literature review focuses on *exhaustive, comprehensive searching*, all published papers until submission of this paper in February 2022 were considered. Duplications of the same papers obtained through different search engines were counted only once, leading to a total of 203 potentially thematically relevant papers. The papers were screened according to the inclusion and exclusion criteria derived from the two research questions above, as illustrated in Table 1. A logbook with all 203 search results was kept in order to maintain a systematic overview of the reasons a paper was excluded or included into the later analysis. Out of the initially obtained 203 papers, 170 papers were subsequently excluded because they were either not peer-reviewed (such as books or book chapters, editorials and conference proceedings) or not set within an African educational context, or because they had no reference to sustainable development and the linguistic dimension, respectively. The remaining 33 papers were then grouped into the three categories general education, higher education as well as basic (comprising primary and secondary) education, the latter including primary and secondary education, and analysed as per sub-questions mentioned above.

Table 1: Processing steps and actions of the systematic literature review according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines

Processing step	Processing action
Search engines and databases	Keywords: <i>Africa* Sustainab*, Language, Education</i>
Identification	Manual identification of 203 potentially thematic relevant papers published in various journals
Abstract screening & eligibility according to including/excluding criteria	<ul style="list-style-type: none"> - Peer reviewed papers published in scientific journals - English language - Published until February 2022 - Connection of language and sustainable development in an African educational setting, meaning authors explicitly researched the connection of these three topics in African institutions of (higher/basic) education, evident from either the respective keywords (e.g. education, language, sustainable development) or the abstract
Analysis & interpretation	Analysis of remaining 33 papers

Limitations of the study

Since this systematic literature review focused on scientific papers published in English language, there is a potential bias towards research undertaken in and on so-called anglophone

African countries. Papers written and published in other languages could possibly lead to different results, as the situation in non-anglophone African countries might differ. Various authors, however, reported similar challenges regarding students' ability to understand the subject matter in so-called francophone (Djité 2008; Gove & Cvelich, 2011; Samuelson & Freedman, 2010) and lusophone African countries (Marinotti, 2017; Skattum & Brock-Utne, 2009; UNESCO, 2011). A literature search considering francophone and lusophone African countries could thus elicit similar results considering the missing empirical evidence and a focus on theoretical considerations instead. This supposition, however, would need to be confirmed by respective future studies. Further, in their study regarding Higher education research in Africa, Zavale and Schneijderberg (2022) found that only 2 % of the articles were published in French or Portuguese, making English the dominating scientific lingua franca. Lastly, a systematic literature review is characterized by potentially missing important information because reports or other grey literature are disregarded (Nakano & Muniz, 2018). In order to understand the scientific body of knowledge in this field, the focus of this paper lies on peer-reviewed journal articles.

Results

The following section presents the results of this systematic literature review.

Author affiliation

The literature review revealed a relatively equal relation of authors affiliations, with a prevalence of authors affiliated with African Universities (24) versus non-African Universities (19). One author was affiliated with two universities in South Africa and United Kingdom, respectively. Contrary to Zavale and Schneijderberg (2022) we conclude that there are more scholars from African countries interested in the connection of ESD and language than from non-African countries. Adams et al. (2010, p. 10) argued that African countries should use their substantial resources in order to solve the enormous challenges the African continent faces, so that “indigenous research could help provide both effective and focused responses.” Adams et al.'s (2010) argument is corroborated by existing research centres affiliated with universities in various African countries researching indigenous knowledge systems, ecological knowledge and African languages (Ulmer & Wydra, 2020). These findings indicate that there is plenty of linguistic research in respective African countries which might not be published in international journals due to various challenges respective authors are facing (Basedau, 2020; Ngongalah et al., 2018).

The distribution of African and non-African universities, as opposed to more scientific output by African universities as could have been expected given the geographical focus on Africa, can be explained by some African scientists publishing under their institutional affiliation in so-called developed countries. When publishing under institutional affiliations outside of Africa, the “African diaspora provides powerful intellectual input to the research achievements of other countries but returns less benefit to the countries of birth” (Adams et al., 2010, p. 3). In other words, papers published by African authors do not get recognized as African contributions to world scientific output (Pauw & Van Zyl, 2011) because these authors are either affiliated with universities outside of Africa or because authors publish in local journals not accessible through electronic databases (Tijssen, 2007). Lotz-Sisitka (2011) further highlighted that due to financial inequalities, international initiatives or research partnerships between Western and African countries may have more influence on Sustainable

Development research than locally constituted initiatives. The World Bank (2014) similarly underlined the existing financial asymmetry of North-South partnerships: collaborations between African institutions and those in so-called developed countries tend to rely on “funding of and hence be driven by the needs and research interests of the latter” (World Bank, 2014, p. 46).

Temporal distribution of published papers

In general, the temporal distribution of publications confirms findings by Zavale and Schneijderberg (2022, p. 230) who described higher education research in several African countries as “still sparse or non-existent”. The earliest published paper obtained for this literature review is by Bodomo (1996) on language and development in Ghana followed by Owuor’s (2008) research in a Kenyan educational setting eleven years later. Figure 1 depicts the temporal distribution of papers published in the timeframe from 1996 to 2022. Research in this area could have been expected to have gained more momentum after 2015 when the SDGs followed the DESD, especially considering SDG 4 which aims to ensure “inclusive and equitable quality education and promote lifelong learning opportunities for all” (UNESCO, 2017, p. 7). However, there are no signs of an uptake of the yearly research output after the year 2007, or after the introduction of the SDGs in the year 2015. Instead, a rather steady number of yearly publications ensued. The spike of publications in the year 2009 can be explained by a special issue in the South African journal *Language Matters: Studies in the Languages of Africa*, which focused on the theme African languages, education and sustainable development.

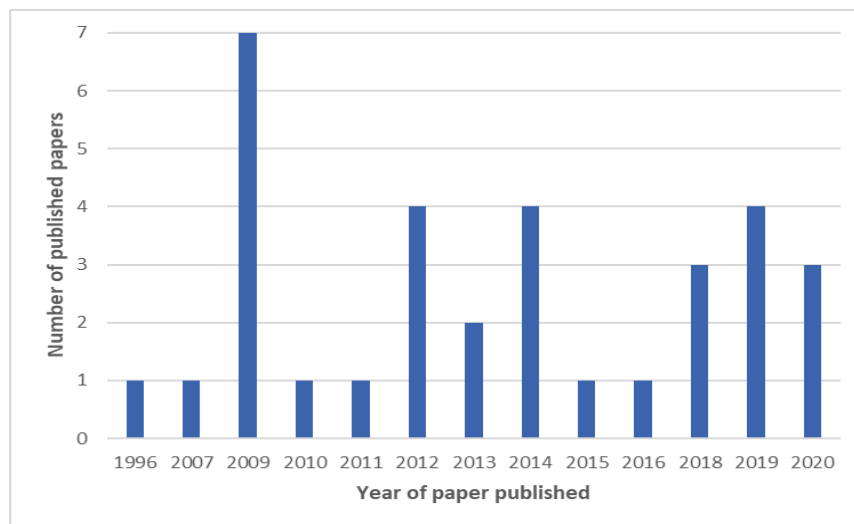


Figure 1: Year and number of published papers (n = 33)

Research methods: Theoretical discourse versus empirical evidence

Most authors pursued a theoretical approach (28), especially those researching language, education and sustainable development in a general educational setting. The arguments presented in the theoretical papers have therefore been based on an “intuitive understanding” (Yahya-Othman, 1990, p. 51) and discourse rather than empirically grounded research. The

prevalence of theoretical approaches therefore supports Tilbury’s (2011, p. 106) argument of ESD not only as being “poorly researched”, but particularly as “weakly evidenced”. Only six of the papers included a methodological section, while the authors of the remaining papers (27) did not explain the underlying methodological considerations. Table 2 subsumes the different themes under four overarching categories:

Table 2: Theoretical papers and their respective approach

Theoretical papers	no.	%
1) Critical account of the relationship between language, education and SD	9	27.3
Critical...		
...account of the relationship between education policy and SD in Africa		
...discourse analysis of ESD and language and the meaning of SD in Africa		
Exploration of...		
...English as a tool for education and SD		
...the links between language, development and literacy		
...the links between language, education and development		
...the link between language and SD: case study of the situation in Nigeria		
...national-level policies, local languages and development		
...the relationship between language and SD: special focus on Nigeria		
...the relationship between African languages and SD		
2) Analysis of languages in development agendas and policies	9	27.3
Analysis of...		
...the MDGs and their complex linkages with language		
...the sustainability concept, discussion of education document		
Argument...		
...for African languages to be part of the MDGs		
...to focus on indigenous languages in order to achieve the 2030 agenda		
Discussion of the role of African language in the actualization of the MDGs		
Examination of the role of language in achieving the SDGs		
Exploration of language practices in Botswana		
Linguistic implications & complications of SADC Protocol / Education training		
Role of language in development agendas (case study MDGs and NEPAD)		
3) Argument for integration of and need for African languages	8	24.2
Argument for...		
...African languages for ESD implementation		
...African languages to be promoted and enhanced		
...the introduction of language technology to include underserved populations		
...recognition of the linguistic diversity in Nigeria for a sustainable future		
Call for African languages to be integrated into education systems for SD		
Demonstration of the need for African languages and belief in development		
Discourse on African languages in science and technology		
Position paper: defense of linguistic rights and integration of African Languages		
4) Propositions/rationales		6.1
Exploration of the meaning of and provide rationale for Indigenous Knowledge		
Proposition of development communication, case study Ghana		
Total theoretical approaches	28	84.9

Abbreviation: NEPAD = New Partnership for Africa's Development; SADC = Southern African Development Community, SD = Sustainable Development

In total, five papers approached the topic empirically: three of them used stakeholder interviews either in the context of primary (Babaci-Wilhite, 2012) and secondary education (Vuzo, 2018) in Zanzibar/Tanzania as well as secondary education in Botswana (Mafela, 2009). Another empirical paper used a Delphi study and administered an online questionnaire to 32 experts working in universities in 16 African countries (Ulmer & Wydra, 2020). The last remaining empirical paper focused both on a review of theory and practice of language and human rights in education, and completed this theoretical foundation with a primary education case study in Zanzibar (Babaci-Wilhite, 2013). Empirical research mostly occurred at the level of primary education. There was only one paper found considering the connection of language and sustainable development in both the secondary and higher educational context, confirming findings by Zavale and Schneijderberg (2022) claiming the Higher Education systems in most African countries have not yet been studied. This prevalence of theoretical approaches in a general educational setting hints to the need of more empirically grounded research, especially in the context of secondary and higher education in order to empirically support the *weakly evidenced* basis. Table 3 gives an overview of the overall and specific themes explored in the respective paper, with two main approaches:

Table 3: Empirical papers and their respective approach

Empirical papers	%	
1) Interviews, observations and document review	9.1	
In-depth interviews with key actors, observation Interviews with key actors, observation, document and literature review Interviews with key stakeholders		
2) Questionnaires, observations and discussions	6.1	
Delphi method, online questionnaire with 32 experts in 29 HEIs General and specific observations, questionnaires, discussions		
Total empirical approaches	5	15.2
Total theoretical and empirical papers	33	100

Abbreviation: HEIs = Higher Education Institutions. Percentages of theoretical and empirical approaches do not total 100 due to rounding.

Country focus

Most papers focused either on Africa or Sub-Saharan Africa (21), while the remaining studies focused on a specific country (12). Nigeria represents the most researched country (5), followed by the Zanzibar Island, as part of Tanzania, which was the most researched country in the empirical papers (3). It could be argued that the focus on Africa as a whole instead of specific countries is due to searching for the key word *Africa**. However, there was barely a difference in search results when entering specific African country names in the search engines. Some papers include *Africa* or *Sub-Saharan Africa* in their key words even when investigating a specific country (e.g. Babaci-Wilhite, 2013; Robinson & Vũ, 2019). The same is true for the key word *education* and more specific forms like *higher education*. The tendency of authors to investigate (Sub-Saharan) Africa as a whole indicates the need for

more country specific empirical studies considering language and ESD, as opposed to the prevailing theoretical studies in a general African context.

Main findings and recommendations

All of the papers noted the importance of language in development processes and agendas, and recommended that local languages and the respective language of instruction need “to be strongly factored into the development agenda” (Vuzo, 2018, p. 803; see also Bodomo, 1996). Authors especially endorsed the integration of indigenous knowledges, including local languages, into the respective curriculum in order for students to understand what they are being taught, and recommended further research to focus on the connection of African languages and sustainable development (Mweri, 2020; Ulmer & Wydra, 2020). This recommendation was corroborated by other authors arguing that the 2030 Agenda for Sustainable Development (Mweri, 2020; Toboso & Kandagor, 2018) and other development agendas (Kaya & Nkondo, 2017; Romaine, 2013; Wiseman & Simuforosa, 2014) may face possible implementation challenges in case the linguistic aspect in education is further disregarded. One author highlighted the importance of the English language in order to facilitate sustainable development in the Nigerian context (Obiegbu, 2015), whereas Ugwu (2020) identified English as a hindrance to sustainable development in Nigeria. These findings are therefore in line with the recommendations of various other authors advocating the need to concentrate research efforts on language in development (Erastus, 2013; Prah, 2012). The language the respective empirical study was conducted in was therefore of particular interest.

Language used in empirical papers

In her studies regarding the change of the language of instruction in primary schools on the Zanzibari island, Babaci-Wilhite (2012; 2013) used Swahili for the interviews undertaken with Zanzibari key actors. Vuzo (2018) similarly conducted the research considering the language used in secondary education in Zanzibar in Swahili. In their study on Sustainability in African Higher Education Institutions, Ulmer and Wydra (2020) used English for the questionnaires for African experts in their Delphi study. No information could be obtained considering Mafela’s (2009) interviews with stakeholders considering the Botswanan secondary education context, neither in the paper nor after contacting the author. These findings considering the language used in empirical papers link to Tilbury and Mulà (2009, p. 46) who highlighted that documents considering ESD “are usually available in the official languages of the country”, and rarely “translated into minority or non-official languages”.

The tendency of not translating documents into African languages potentially leads to a solely academic rather than necessary public circulation of the findings. Similarly, studies undertaken in English as opposed to a local language may represent a hindrance in gathering relevant scientific information, depending on the respective research context. While English as the international scientific language is recognized as being “valuable for connecting internationally” (Odora Hoppers, 2017, p. 28; see also Hameso, 1997), its use can simultaneously create “a serious communication gap between the formal education system and its social environment” (Ouane & Glanz, 2010, p. 9). Various authors backed up this assertion and criticised higher education in Africa as still representing an elitist system (Cloete & Maassen, 2015; Darvas et al., 2017; Senkoro, 2005), meaning they are

disconnected from broader society (Cloete, Bunting, & Van Schalkwyk, 2018; UNDP, 2004; UNESCO, 1975).

Type of journal

In general, a broad spectrum of journals was identified. The 33 obtained papers were published in a total of 24 different journals, whereas eight different disciplines were identified. The interdisciplinarity of ESD in connection with language implies that “no single discipline has a monopoly of interest in it” (Kamwendo, 2009, p. 1). However, a prevalence of educational journals (10), followed by journals in the area of linguistics (8), arts, humanities and social sciences (4) as well as sustainability (4) was observed. Table 4 shows an overview of these disciplines and respective journals. Five journals focus on Africa in particular, namely one journal based in South Africa, one in Tanzania and one journal based in the United States of America. The remaining two journals reside within the sub-discipline of African studies. The relatively few papers in sustainability journals compared to the prevalence of educational and linguistic journals indicate that language issues are not yet integrated into sustainability sciences. In a special issue of the *International Journal of Sustainability in Higher Education* (Volume 17, Issue 2), titled “*Sustainable Development at Universities: Trends From Africa*”, none of the authors researched language in connection with sustainable development, highlighting again the argument of a largely ignored research field.

Table 4: Thematic areas and titles of journals reviewed papers were published in

Journal area and journal title	No. of papers	Percent
Education	10	30.3
International Journal of Educational Development	3	
International Review of Education	3	
Asia Pacific Education Review	1	
International Education	1	
Journal of Contemporary Issues in Education	1	
World Studies in Education	1	
Linguistics	8	24.2
Language Matters: Studies in the Languages of Africa	3	
Applied Linguistics Review	1	
Journal of Multilingual and Multicultural Development	1	
Kioo cha lugha	1	
Linguistics and Literature Studies	1	
World Studies in Education	1	
Arts, Humanities and Social Sciences	4	12.1
Scholars Journal of Arts, Humanities and Social Sciences	2	
Human Ecology	1	
<i>Alternation</i>	1	
Sustainability	4	12.1
Journal of Sustainable Development in Africa	2	
International Journal of Sustainability in Higher Education	1	
Sustainability	1	
Scientific and Research	3	9.1

European Scientific Journal	2	
International Journal of Scientific and Research Publications	1	
African Studies	2	6.1
Nordic Journal of African Studies	1	
The Journal of Pan African Studies	1	
Computer Science	1	3.0
Computer Science	1	
Political Science	1	3.0
Open Journal of Political Science		
	Total: 33	100%

Percentages do not total 100 due to rounding.

Discussion

The results of this research indicate potential issues in sustainable development communication with implications for both the societal as well as the scientific level: Since all national and international development agendas are in one way or another linked to and aimed at people, “languages of the Africa[n] masses” inevitably need to be part of those agendas (Toboso & Kandagor, 2018, p. 114). The vast majority of the populations not fluent in former colonial languages have been and will be marginalized for decades to come in case research findings are not heeded (Qorro, 2013). In order to heed research findings and to determine own research priorities, funding systems and corresponding research agendas, possibly from outside of Africa, need to be addressed. As elaborated under the section ‘author affiliation’, Africa’s low performance in international research output (Duermeijer et al., 2018) can be traced back to African authors’ university affiliation and dependencies in funding rather than intellectual poverty (Zambakari, 2011). A self-critical call by Romaine (2013), Alexander (2003) and Williams and Cooke (2002) could be seen as a possible antidote to this bleak societal prospect: These authors urged educational and linguistic researchers to strengthen their efforts to communicate their findings more effectively to both researchers of other disciplines as well as policy makers and also international funders. Reoccurring recommendations in reviewed papers considering the need to address African languages and (sustainable) development, however, suggest that this self-critical call did not achieve the intended impact. The prevailing tendency towards disciplinary research needs to be translated into inter- and transdisciplinary approaches (Moore, 2005) in order to reflect the multifaceted nature of sustainable development. Researchers therefore need to find new ways to build bridges between academia and policy leaders (Bothun, 2016), so that scientific results may be better harmonized with and reflected in educational and developmental policies.

Conclusion and Further Research

This systematic literature review analysed the scientific body of knowledge considering the connection of language and sustainable development in an African educational context. Table 5 presents a summary of the key findings of this literature review. The results indicate that language represents a largely ignored factor and a hidden aspect (Benjamin, 2014) in the sustainable development agenda, with no signs of an uptake of research in this field since the introduction of the SDGs in the year 2015. Wolff’s (2016) characterisation of language and sustainable development as *under-researched*, particularly in the empirical sense, is corroborated by both the predominantly theoretical methodical approaches as well as the

focus on Africa as a whole in most research papers. The majority of authors pointed to the need of further research in this area, especially considering the importance of African languages in the (sustainable) development process.

Table 5: Summary of key findings

Subcategory	Summarized findings
Author affiliation	There is a slight prevalence of authors affiliated with African (24) versus non-African (19) universities.
Temporal distribution	Research output peaked in 2009 due to a special issue in a South African journal; no increase of papers after the introduction of the SDGs.
Research methods	Prevalence of theoretical (28) over empirical (5) approaches. Methodological considerations were elaborated only in a few papers (6), while the authors in the remaining papers (27) did not elaborate their method in a separate section.
Country focus	Mostly in a general, educational (Sub-Saharan) African setting. A prevalence of country-specific research was mainly found in empirical papers.
Main findings and recommendations	Almost all authors noted the importance of language in development, highlighting the neglect of the linguistic sphere in sustainable development. Recommendations included, <i>scientifically</i> , to research the connection of African languages and sustainable development and, <i>pragmatically</i> , to make African languages an integral part of curricula and developmental agendas.
Language used	In case of empirical papers: Swahili (3), one English and one unknown.
Type of journal	There is a prevalence of journals in the disciplines of education; linguistics; arts/humanities/social sciences; and sustainability, together totalling more than 81%.

Hence, based on the key findings presented in table 5 as well as based on emerging themes while analysing the 33 papers, the authors of this paper propose future research to delve deeper into the areas presented in table 6. This future research should, first and foremost, investigate why language does not attract enough attention at the political level, which includes major international institutions when establishing development agendas, although the importance of language is scientifically well established. Due to the “complexity of the notion of ESD” (Kamwendo, 2009, p. 2), even more so in connection with language, the list cannot be seen as exhaustive, but should rather be used as a pointer for future research.

Table 6: Research areas for further research in ESD and language

Area	Guiding question(s)
ESD and language	Why does language not attract enough (scientific, societal, political) attention in ESD, while its importance in knowledge acquisition is well established (Wolff, 2006)? Which actors and institutions need to be involved in order to uncover language as the hidden aspect of ESD, especially in countries in which only a minority of the population has a sound command of the official national language?
Language and development agendas	How does language affect the implementation of each respective SDG (similar to research undertaken by Romaine (2013) and Toboso & Kandagor (2019) in the case of the MDGs)?
African languages in curricula	Was there progress considering the integration of African languages into curricula as requested by several authors and, if so, what was the approach taken by the respective government?
Empirical evidence	Do empirical research approaches corroborate theoretical reflections considering the connection of language and ESD? What's the experience and perception of different education stakeholders considering the connection of language and sustainable development? What is the awareness and perception of students in different countries of the SDGs, and how do they integrate and translate the SDGs in their own research?
Educational focus	What is the role of African higher education institutions in connecting language and sustainable development?
Research in other languages	Will systematic literature reviews in francophone and lusophone African countries yield similar results as this systematic literature review undertaken with a focus on English scientific literature? Does research undertaken in local languages enhance and/or corroborate insights compared to research undertaken in former colonial languages?

Given the current prevalence of theoretical methods, it is proposed to approach all suggested questions in table 6 predominantly from an empirical point of view. Research grounded in evidence (UNESCO, 2014), with specific countries and specified forms of education at the centre of their investigation, could support the drafting process as well as the implementation of national and international development agendas such as the SDGs. Research should also be undertaken in languages other than English in order to access data which may otherwise be blocked by the language barrier. Joint scientific efforts based on empirical approaches may support both the liberation of language from its current position as the hidden aspect in development in general, and specifically African languages from their invisibility in the sustainable development process.

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Annex 3b: List of reviewed scientific papers for the systematic literature review

#	Authors and paper title
1	Ahmed, U. (2018). Language Use Optimization as a Strategy for Fostering Sustainable Development in Sub-Saharan Africa, <i>Scholars Journal of Arts, Humanities and Social Sciences</i> , 1238-1244, http://dx.doi.org/10.21276/sjahss.2018.6.6.9
2	Babaci-Wilhite, Z. (2013). Local Languages of Instruction as a Right in Education for Sustainable Development in Africa, <i>Sustainability</i> 2013, 5, 1994-2017; http://dx.doi.org/10.3390/su5051994
3	Babaci-Wilhite, Z. (2012). A Human Rights-Based Approach to Zanzibar's Language-in-education Policy, <i>World Studies in Education</i> , 13(2), 17-33, https://doi.org/10.7459/wse/13.2.03
4	Babaci-Wilhite, Z.; Macleans, A. G. J.; Lou, S. (2012). Education and language: A human right for sustainable development in Africa, <i>International Review of Education</i> , 58, 619–647, https://doi.org/10.1007/s11159-012-9311-7
5	Bangbose, A. (2014). The language factor in development goals, <i>Journal of Multilingual and Multicultural Development</i> , 35(7), 646-657, https://doi.org/10.1080/01434632.2014.908888
6	Benjamin, M. (2014). Participatory Language Technologies as Core Systems for Sustainable Development Activities, <i>Computer Sciences</i> , Corpus ID: 59987033, https://infoscience.epfl.ch/record/200379
7	Bodomo, A. B. (1996). On Language and Development in Africa: The Case of Ghana, <i>Nordic Journal of African Studies</i> , 5(2), 31-51.
8	Breidlid, A. (2009). Culture, indigenous knowledge systems and sustainable development: A critical view of education in an African context, <i>International Journal of Educational Development</i> , 29, 140-148, https://doi.org/10.1016/j.ijedudev.2008.09.009
9	Harries, J. (2010). Translation and the Language of Implementation of Third-World Development – a Study on Sustainability in Africa.' <i>Journal for Sustainable Development in Africa</i> , 12(3), 373-386.
10	Ibrahim, M. & Ahmed, U. (2018). Indigenous Languages and the Question of Development in Postcolonial Africa: Focus on Nigeria, <i>International Journal of Scientific and Research Publications</i> , 8(12), 41-49, http://dx.doi.org/10.29322/IJSRP.8.12.2018.p8409
11	Kamwendo, G. (2009). The SADC protocol on education and training: Linguistic implications and complications, <i>Language Matters: Studies in the Languages of Africa</i> , 40(1), 4-17, https://doi.org/10.1080/10228190903086100
12	Kaya; H.O. & Nkondo, G.M. (2016). African Indigenous Languages and the Millennium Development Goals in South Africa, <i>Journal of Human Ecology</i> , 53(2), 176-184, https://doi.org/10.1080/09709274.2016.11906970
13	Mafela, L. (2009). Code-switching in Botswana History classrooms in the Decade of Education for Sustainable Development, <i>Language Matters: Studies in the Languages of Africa</i> , 40(1), 56-79, https://doi.org/10.1080/10228190903055568
14	Manteaw, O. O. (2012). Education for sustainable development in Africa: The search for pedagogical logic, <i>International Journal of Educational Development</i> , 32, 376-383, https://doi.org/10.1016/j.ijedudev.2011.08.005
15	Mathooko, M. (2009). Actualizing Free Primary Education in Kenya for Sustainable Development. <i>The Journal of Pan-African Studies</i> , 2(8), 151-159.
16	Mavesera, M. (2011). Situating African languages in the global village for sustainable development: Attractions and challenges for Zimbabwe, <i>Journal of Language and Culture</i> , 2(5), 72-81, Available online http://www.academicjournals.org/JLC
17	Mooko, T. (2009). Language policy and practice in Botswana in the context of education for sustainable development, <i>Language Matters: Studies in the Languages of Africa</i> , 40(1), 18-34, https://doi.org/10.1080/10228190903085532

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- 18 Mutembei, A. (2014). African Languages as a Gateway to Sustainable Development, Democracy and Freedom: The Example of Swahili, *Alternation Special Edition*, 13, 326-351, ISSN 1023-1757
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Annex 4: Third Paper: Lost in translation?

- a) Published paper**
- b) Questionnaire and interview guideline**

3. Fachaufsatz:

Ulmer, N., Divine, N. & Wydra, K. (2023). Lost in translation? Tanzanian students' views on sustainability and language, and the implications for the pledge to leave no one behind. *International Journal of Sustainability in Higher Education*, 24(7), 1381-1397.

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Aufgrund rechtlicher Begebenheiten darf dieser Fachaufsatz nicht in dieser Dissertation veröffentlicht werden. Nachfolgend gelistet sind daher der Fragebogen sowie die Interview Guideline des Fachaufsatzes. Der Autor darf Interessierten den Fachaufsatz auf Nachfrage zur Verfügung stellen.

The following questions show the English version of the questionnaire sent to the participants of the Tanzanian university. The questionnaire was exported from GoogleForms, therefore some answer options are shown in small boxes. The original was sent in Swahili and filled accordingly by participants. The questionnaire is structured into the four areas of (1) Sustainability, (2) Research, (3) Translation and (4) Demographics. At the end of the questionnaire, participants were asked whether they would be willing to be interviewed.

Sustainability and language in education in Tanzania

Dear participant,

Despite the importance of language in communication, language was not mentioned in the Sustainable Development Goals (SDGs) of the United Nations. This survey aims to get your opinion and experience: were you taught about sustainability at school and at university and how do you address the Sustainable Development Goals in your research?

My name is Nico Ulmer, I am a PhD student at Leuphana University, close to the city of Hamburg in Northern Germany. Answering this questionnaire is voluntary and will only take 5 minutes. My dissertation deals with sustainability and language in education. Your answers will be treated with great confidentiality, no one will see what you answered other than me. Your participation will help me write an article for the PhD.

In case you'd like to know more about this study, do not hesitate to contact me. Also, you can mention your email and/or phone number at the end of the questionnaire if you are interested in the outcome of this study.

Email: Nico.ulmer@gmail.com

Whatsapp: +255 7162 588 79

Thank you very much, Nico

(1) Let's get started: Sustainability...

Have you ever heard about the concept of sustainability?

Yes

No

If the answer is yes, how do you briefly define this concept?

[Short-answer text]

When you went to school (primary and secondary), were you taught about sustainability?

Yes
No

If the answer is yes, in which areas were you taught about (e.g. energy, environment, ...)?

[Short-answer text]

Are sustainability issues part of the curriculum taught in your university course?

Yes
No

If the answer is yes, what exactly are you being taught about (energy, environment, etc.)?

[Long-answer text]

Are the Sustainable Development Goals part of your curriculum?

Yes
No

If the answer is yes, what are the specific objectives being taught? Tick all that apply.

- 1 No poverty
- 2 Zero Hunger
- 3 Good Health and Well-being
- 4 Quality Education
- 5 Gender Equality
- 6 Clean Water and Sanitation
- 7 Affordable and Clean Energy
- 8 Decent Work and Economic Growth
- 9 Industry, Innovation and Infrastructure
- 10 Reduced Inequality
- 11 Sustainable Cities and Communities
- 12 Responsible Consumption and Production
- 13 Climate Action
- 14 Life Below Water
- 15 Life on Land
- 16 Peace and Justice Strong Institutions
- 17 Partnerships to achieve the Goal

Is there another place or institution where you learned or were taught about sustainability?

Yes
No

If the answer is yes, please describe the institution and the content of the training.

[Short-answer text]

(2) Your research...

Are you addressing the Sustainable Development Goals in your research?

- Yes, I do address them
- No, I do not address them
- I haven't started my research yet

If the answer is yes, which of the 17 Sustainable Development Goals are you addressing?

[Long-answer text]

Does your research involve obtaining information from members of the community?

Yes
No

If the answer is yes, what method are you using to collect information from them?

- Through questionnaires
- Through interviews (face to face, online or via phone)
- Through Focus group discussions
- Other: ...

When doing research, what language do you use to communicate with your participants?

- Swahili
- English
- Other: ...
- I haven't started my research yet

In your experience, how important is language in doing research?

Very important

1

2

3

4

Not very important

5

Please, describe your view of the importance of language in research!

[Long-answer text]

(3) Translation...

In your research, how do you handle translation from English to Kiswahili and vice versa?

[Multiple answers allowed]

- I'm translating completely myself
- I'm using digital means such as Google Translate
- I'm using professional translation services
- I'm supported by my supervisor or friends
- I haven't started my research yet
- Other: ...

(4) And finally, demographics...

Your gender

Male
Female

Your age

19-25
26-30
31-35
36-40
41-45
46+

What is your professional background? (Engineering, computer sciences, environment, ...)

[Short-answer text]

What is your level of education?

- Master
- PhD

Is there anything else you would like to ask or tell me? Asking is not stupid [a Swahili saying]!

[Short-answer text]

Would you like to share your thoughts in depth? I would like to hear your experience in matters of sustainability, research and language through an interview. If interested, please leave your name and Whatsapp number. I am going to contact you within the next few days regarding a fitting time and date. In case of any questions in the meanwhile, I am available via Whatsapp +255 7162 588 79 and Email nico.ulmer@gmail.com

Thanks, Nico

Your name and WhatsApp number

[Short-answer text]

Are you interested in the outcome of this study? If so, leave your email-address and I'll send you the paper, once published.

[Short-answer text]

Thank you very much for your participation!

In the following, the interview guideline is presented. As stated in the 3rd paper, interviewees were contacted after participants left their contacts in the questionnaire.

Interview guideline for the 3rd paper

Hello [*name of the respective interviewee*],

My name is Nico, PhD student from Germany. I was living at your university for a couple of years, but left back to Germany in 2019. You have filled in a questionnaire about sustainability that I sent the earlier this year via the email distribution list. Do you remember the questionnaire?

➔ *ask questions about news of the university, Arusha and their research*

My own research deals with sustainability in connection with language. I am interested whether people outside of the university are aware of the concept of sustainability and the Sustainable Development Goals (SDGs in short). I'd like to hear your experience regarding this topic, unless you have some questions about the research?

If you don't mind, I'm going to record the conversation. I will keep your answers anonymous, so you will not be identifiable, and the recording is going to be deleted after transcription.

➔ *Start recording after receiving agreement*

Questions:

- 1) In your experience, are sustainability and the Sustainable Development Goals (SDGs) known in the community where you do or did the research? When I say community, I refer to the so-called average citizen in Tanzania, meaning those people who did not attend higher education.
- 2) Could you give an estimate about the percentage of those average citizens in communities who have heard about sustainability and the SDGs?
- 3) Do you personally think it is important for people in society to be educated about sustainability and the SDGs?
 - a. If the answer is yes, in which ways do you think could people in the community could be educated about sustainability and the SDGs?
 - b. In your personal opinion, which language should be used to educate people about sustainability and the SDGs?
- 4) Do you have any other comments or advice regarding this research?

End of interview:

- ➔ *Thank for participation; stop recording*
- ➔ *Offer to send paper once published; if interviewee approves, ask for email address*
- ➔ *Wish good luck in research; greetings*

Nico