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ESD, CRITIQUE, AND EPISTEMIC INJUSTICE

Unveiling Epistemic Injustice in Education for Sustainable Development: A Critical Examination

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Supervisor:	Kassahun Weldemariam
Examiner:	Ernst Thoutenhoofd

Abstract

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Aim: Within the global arena where Education for Sustainable Development (ESD) is implemented as a global policy, a dual dynamic of epistemic diversity and epistemic inequality coexists. In light of this complex reality, this study systematically delves into the theoretical critiques of ESD through an epistemic lens. It perceives criticism as akin to an epistemic power struggle, portraying critique not merely as dissent but as intricate performances unveiling the underlying epistemic tensions within the domain of ESD.

Theory: The study is grounded in Miranda Fricker's seminal work on epistemic injustice, *Epistemic Injustice: Power and the Ethics of Knowing* (2007). It is supplemented by subsequent developments of her work in general, and is particularly informed by the holistic framework in epistemic injustice developed by Cummings et al. (2023) which integrates epistemic (in)justice with the sustainable development discourse.

Methodology: The study employs a systematic review methodology. Forty-three articles from the Education Resource Information Center (ERIC) database were analysed and inclusion criteria were established to enhance the relevance and quality of the included studies. PRISMA guidelines were followed to ensure a comprehensive and transparent approach incorporating adequate quality appraisal filters.

Results: By interpreting criticisms as manifestations of varied epistemic positions, the study reveals the complex interplay of diverse epistemic positions within ESD highlighting the contentious nature of the discourse. It underscores epistemic tensions in ESD critique revealing heterogeneous ways in which epistemic injustices can arise, which encompass injustices stemming from individual, collective, structural, and systematic aspects. Thus, the study not only identifies areas of discontent in ESD, but also provides insights into realizing ESD's pluralistic aims and navigating the challenges of promoting epistemically inclusive practices. Ultimately, the study contributes to a nuanced understanding of ESD's potential to engender and/ or perpetuate epistemic injustice and raises questions with regards to ESD's capacity to foster successful knowledge co-production among disparate worldviews. Given that epistemic justice is a prerequisite for social justice, the study ultimately highlights the imperative to address both aspirations in tandem, particularly within the context of ESD.

Foreword

As I embark on this remarkable journey, my heart overflows with gratitude for the unwavering support of the extraordinary persons I have been fortunate enough to cross paths with.

I remember with heartfelt gratitude Prof. Arjuna Parakrama, and all my mentors, colleagues, and friends at the University of Peradeniya, Sri Lanka. They are the foundation I stand on today.

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To my brilliant international friends in IMER, who made stunning yet freezing libraries dotted around Gothenburg a touch warmer, I cherish our shared moments and look forward to the continuation of our companionship, wherever our paths may lead.

With deepest love, I remember my parents, siblings, and Sathi. To my best of friends, I eagerly count the days until we reunite on our favourite beach back home, the waves echoing our laughter, guitars strumming, and voices lifted in song.

All those named and the many more unnamed, have been my perpetual source of inspiration. With heartfelt gratitude, I dedicate this study to them, acknowledging their profound influence on both my intellectual and personal growth.

May their wisdom always light my way forward.

May their love forever enrich my spirit.

On some days philosophies wash away like sand, and faith crumbles like rust. On those days, the only word I have is my (he)art. If only my (he)art were a perfect wave and not an erratic sea that I know little about. But at least there is a sea, for that I am grateful. Even though it is as fearless as it is timid, as despairing as hopeful, it carries me with it. Its vastness is liberating, for on some days, I am possessed by the broad strokes, the bigger picture; on others, it's the mundane, the minute, 'seeing the whole world in a grain of sand', sort of madness. As terrible as it is, it is perhaps my only redemption. Despite its pretence, drudgery, and broken dreams, my (he)art is the only beautiful perpetual.

To Radu, who may never read this, yet read my (he)art in the best of ways.

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List of abbreviations

ESD	Education for Sustainable Development
PRISMA-S	Preferred Reporting Items for Systematic reviews and Meta-Analyses
SD	Sustainable Development
SDGs	Sustainable Development Goals
UN	United Nations
UNESCO	The United Nations Educational, Scientific and Cultural Organization

1 Introduction

Can we read critique as a window into a different worldview?
What if we do?
What will it teach us about the critique and the criticised?

1.1 Overview and aims

Sustainable Development Goals (hereafter, SDGs) are the key framework that we have today for guiding global efforts towards addressing interconnected social, economic, and environmental challenges and achieving a more sustainable and equitable future for all. Education for Sustainable Development (hereafter, ESD) plays a crucial role in enabling the achievement of SDGs by equipping individuals with the knowledge, skills, and values necessary to contribute to sustainable development efforts, thus fostering a more informed and empowered global citizenry (Boeren 2019; UNESCO, 2016, 2019). The notion of justice permeates all aspects of SDGs and ESD, serving as a guiding principle to ensure that sustainable development efforts are equitable, inclusive, and responsive to the needs and rights of all individuals and communities, particularly those who are marginalized or disadvantaged (SDG Resource Centre, 2024). It also encompasses the aim of promoting multi-generational and multi-species well-being (Kopnina and Cherniak 2016), a critical aspect of justice. However, ESD, and by extension the SDGs, are subject to significant scrutiny and critique within scholarly discourse. The contested nature of ESD and SDGs underscores the importance of critically examining the diverse array of criticisms levied against these frameworks.

In this thesis, my aim is to systematically explore the multifaceted nature of theoretical criticisms directed towards ESD. More specifically, this study aims to discern the theoretical critique of ESD through an epistemic lens; in other words, it is an attempt to examine whether the criticisms directed towards ESD stem from epistemic disagreements. In doing so, this study aims to ascertain whether the criticisms illuminate instances where ESD may perpetuate and/ or engender epistemic injustice. Such a line of inquiry is imperative as the SDGs and ESD prioritise social justice at their core and achieving epistemic justice and/ or redressing epistemic injustice is essential for achieving social justice (Cummings et al. 2023), while embracing plurality as a means to achieving this objective. It is an essential step in realising ESD's commitment to equity, diversity, and inclusion (Druker-Ibáñez and Cáceres-Jensen 2022).

To reiterate, my aim in this study is to examine the ways in which epistemic disagreements in the critique of ESD, if any, my engender and/ or perpetuate epistemic injustice. In other words, it is an examination of ESD's capacity to embrace alternative worldviews and negotiate epistemic disagreements within its critical domain without engendering and/ or perpetuating epistemic injustice, if the critical space of ESD can be conceptualised as a space rife with epistemic disagreements. Essentially, this study aims to conceptualises the critical domain of ESD vis-à-vis a spectrum of divergent views and narratives, thereby shedding light on its implications for the promotion of epistemic justice.

In essence, the study poses questions about ESD's ability for successful knowledge co-production between the different worldviews in its exploration of the interesting dichotomy between the plurality-oriented and epistemically inclusive aspirations of ESD, and its possible (hegemonic) tendency that can lead to injustices that are epistemic in nature. To do so, it reads critiques as windows into different worldviews, recognizing them not only as expressions of dissatisfaction or disagreement but also as reflections of alternative epistemic assumptions and perspectives. By examining criticisms through this lens, the study seeks to unravel the complex interplay between diverse knowledges/ knowledge bearers and the potential for ESD to effectively bridge epistemic divides. Through this process, the study aims to illuminate ways for enhancing ESD practices to better accommodate and integrate diverse worldviews, ultimately advancing its capacity to facilitate meaningful dialogue, foster inclusivity, equity, and sustainability across diverse socio-cultural and epistemic contexts and enhance our collective understanding and implementation of sustainability education.

1.2 Stating the relevance

Epistemology, sustainability, and justice intertwined.

In 2024, as I write this reflecting on the current state of global affairs, it is evident that achieving the SDGs by 2030 poses a formidable challenge. This challenge is further complicated by a knowledge crisis: there is a proliferation of diverse, sometimes supplementary, and often conflicting, knowledges at play (Druker-Ibáñez and Cáceres-Jensen, 2022). There is also a growing awareness of the limitations of hegemonic knowledge paradigms, leading to a recognition of the imperative of embracing epistemic plurality (Breidlid and Krøvel, 2020). This acknowledgment highlights that no single knowledge system or paradigm can claim absolute authority or adequately address the complexities of contemporary crises (See, for example, Breidlid and Krøvel, 2020). Embracing epistemic plurality involves recognizing the value of diverse perspectives while actively working to challenge unjust epistemic hierarchies that hinder epistemic justice. What this essentially recognises is that there are a myriad of answers and ways forward, some carrying more weight or prominence than others, not necessarily because they are inherently true or correct. In fact, there are no epistemically innocent standpoints (Medina, 2011, p. 30-31, as cited in, Allen, 2017). So, how do we choose a path? How do we know the path we have chosen is the best one? How do we do ESD in a world marked by a dual reality of epistemic plurality and epistemic inequality? This realisation prompts us to ask if the sustainability crisis is essentially an epistemic crisis too. Thus, in this study, epistemology and sustainability are perceived as intrinsically intertwined.

To reiterate, it is evident that our world is characterized by epistemic diversity; yet, this diversity coexists with significant epistemic inequality (see, for example, Demeter 2020; Go 2017; Morgan et al. 2018; Silva Filho et al. 2023). This dynamic gives rise to a perpetual struggle among different worldviews, each vying for recognition and validation. This struggle, often overlooked, warrants greater attention in research. By acknowledging and critically examining the complexities of epistemic plurality, epistemic inequality, and the ensuing epistemic tensions arising from their interaction that can engender epistemic injustice, we can gain valuable insights that can inform more inclusive and equitable approaches to educational research, policy-making and practice, ultimately contributing to a more just and sustainable future.

Essentially, the relevance of this study lies in its endeavour to address questions and challenges with regards to redressing epistemic injustice. By critically examining the criticisms surrounding ESD through an epistemic lens, this research aims to shed light on the complexities inherent in the discourse, and contribute to a deeper understanding of the implications of epistemic (in)justice within the context of (sustainability) education. To state broadly, through rigorous analysis and thoughtful inquiry, this study seeks to offer insights for enhancing inclusivity and equity in ESD. Ultimately, by unravelling the nexus between epistemology and (sustainability) education, this study seeks to contribute to the critical dialogue on mitigating epistemic injustice in our pursuit of sustainability education objectives.

Why focus exclusively on theoretical critiques of ESD?

The decision to concentrate solely on theoretical critiques, acknowledging the fundamental challenge of delineating theory from practice, was made in consideration of the inherent limitations posed by the scope of a thesis of this nature. Recognizing the constraints on depth and breadth that confine this study, the emphasis on theoretical critiques provides a focused lens for analysis, allowing for a more in-depth exploration of the conceptual underpinnings and intellectual discourse surrounding the subject matter. It is done while recognizing that the practical aspects remain an integral and interconnected component of the broader discussion. Moreover, the decision to focus solely on critique is also justified as it facilitates a thorough examination of weaknesses, precise problem identification, and targeted improvements. This systematic review is, at its core, driven by the understanding that the effectiveness of ESD in advancing sustainability hinges on its adaptability and capacity for enhancement. By exploring the criticisms and the overarching critical themes within the field, this review aspires to guide and shape future research, policies, and practices in the realm of sustainability education. The ultimate goal, thus, is to provide a comprehensive overview of the challenges in ESD, offering valuable insights that can amplify the impact of ESD for present and future generations.

Critique as an epistemic power struggle

What is novel about this study is its re-interpretation of critique as a constructive tool for understanding and advancing ESD. Rather than viewing critique solely as a form of opposition or dissent, this thesis reframes it as a valuable lens through which to examine the underlying epistemic disagreements (see, Chapter 2 for a discussion) embedded within ESD critique: Essentially, I conceptualize criticism as akin to a theatrical production or an epistemic power struggle. This innovative perspective seeks to illuminate the dynamics of critique not merely as isolated acts of dissent, but as multifaceted performances that reveal underlying power dynamics and epistemic tensions in ESD. By adopting this theatrical metaphor, I hope to unpack the performative aspects of critique, including the roles played by various actors, the staging of arguments, and the negotiation of knowledge claims. Moreover, viewing criticism through the lens of an epistemic power struggle allows for an exploration of how different knowledge systems vie for recognition and legitimacy within the realm of ESD. In doing so, the study seeks to examine the ways in which this epistemic struggle my engender and/ or perpetuate epistemic injustice. Thus, this conceptualization opens up avenues for analysing how critiques challenge dominant narratives, disrupt established hierarchies, and ultimately shape the trajectory of sustainability education. Through this lens, my study aims to offer insights into the complex interplay between critique, power, and knowledge production in the context of ESD.

Some cautionary notes

Several cautionary points warrant consideration. Firstly, it is not within the scope of this study to pass judgment on the critiques themselves or to validate them. While quality assessments of the scholarly literature within the literature review protocol are conducted, these quality evaluations do not inherently encompass an appraisal of the critiques' quality. Rather, it is assumed that, if the scholarly literature included meet the quality assessment criteria of the literature review protocol, then the critiques presented within them are valid. Furthermore, I refrain from positing that all critique stems exclusively from marginalized perspectives or that all authors who articulate such critiques occupy marginalized positions themselves. The veracity of this claim is contingent upon various factors, including the particular nature of the critique and additional considerations such as the intersectional identity of the individual presenting it, as well as their positioning within academic hierarchies. Instead, my contention is that each critique represents an alternative perspective on ESD, and thus, merits consideration; My aim is to examine the ways in which this alternative perspective may be marginalised within the broader discourse surrounding ESD. It is very much a conceptual exercise. Accordingly, this study predominantly operates on a conceptual level.

1.3 Research questions

The following research questions guide this study.

I. What are the key theoretical critiques of Education for Sustainable Development (ESD)?

II. Are there epistemic tensions embedded in the theoretical critiques of Education for Sustainable Development (ESD)?

III. If any, to what extent can the epistemic tensions embedded in the theoretical critiques of Education for Sustainable Development (ESD), lead to epistemic injustice?

IV. What are the ensuing implications for the pursuit of epistemic justice within and/ or through Education for Sustainable Development (ESD)?

1.4 Theoretical lenses

The theoretical foundation of this study is primarily rooted in Miranda Fricker's influential work, *Epistemic Injustice: Power and the Ethics of Knowing* (2007), and the subsequent advancements in the field. Particularly, I employ the holistic framework in epistemic injustice developed by Cummings et al. (2023), wherein they outline a comprehensive framework for the examination of epistemic injustice. This framework represents a pioneering effort in merging the literature on epistemic injustice and sustainable development. Consequently, its relevance to this study is significant (see chapter 3 for further

justification). They systematically construct this framework by interlinking key concepts from existing literature in a hierarchical structure. This serves as a heuristic tool, facilitating the delineation of manifestations of epistemic injustice across individual, collective, structural, and systemic levels. This framework of epistemic injustice serves as the principal theoretical lens through which the critical discourse pertaining to ESD is analysed.

1.5 Outlining my methods and justifying its selection

I found the method of the systematic literature review process to be the most appropriate for this study for several reasons. Petticrew and Roberts (2006) argue that researchers typically operate within a paradigm or school of thought where there exists an unspoken consensus regarding the subjects worthy of exploration (p. 20). In their perspective, systematic reviews provide an opportunity to challenge established paradigms, achieved through a meticulous examination of the foundational evidence (p. 20). Given the firmly entrenched status of ESD as a predominant and necessary educational approach in the contemporary educational domain, there is a genuine need to ascertain its true effectiveness. To do so, it becomes imperative to evaluate the effectiveness of this policy and to gain a comprehensive understanding of the evidence within this domain. For this purpose, a systematic review is particularly advantageous. This approach enables the systematic gathering, analysis, and synthesis of literature, thereby facilitating the development of arguments and evidence-based insights regarding the efficacy of ESD as a global policy practice

Additionally, the systematic review process facilitates the comparison of findings across studies and the exploration of diverse perspectives, enabling researchers to draw more robust conclusions about ESD as a global policy. Furthermore, when a comprehensive overview of the available evidence on a particular topic is necessary to guide future research endeavours, a systematic review emerges as the most appropriate choice (Petticrew and Roberts, 2006, p. 21). Consequently, it serves as the ideal method to identify the areas that warrant further exploration in future research. More importantly, as highlighted by Petticrew and Roberts (2006), systematic reviews serve as a crucial tool for mitigating biases inherent in traditional literature reviews. By following a rigorous and transparent methodology, systematic reviews provide a structured approach to synthesizing evidence, reducing the risk of selective reporting. Moreover, systematic reviews act as “a "gyroscope" with an in-built self-righting mechanism” (Petticrew and Roberts, 2006, p. 6), ensuring that the analysis remains anchored in objective criteria and standards. This methodological approach enhances the reliability and validity of the findings, allowing for conclusions to be drawn from the synthesized evidence.

1.6 Acknowledging my limitations and my positionality as a researcher

Let me begin by acknowledging that engaging in epistemological dialogue is a complex and difficult undertaking, far from easy or straightforward. The epistemological landscape is undeniably diverse and also marked by profound inequalities. I recognize that my capacity to effect significant change may be

limited, and perhaps, my most achievable goal within this study is to discern the tensions arising from the conflict between dominant perspectives and alternative viewpoints within ESD, should they exist. In pursuit of this goal, I systematically re-read critiques of ESD, consider the narratives they articulate, assess whether these narratives elucidate any divergent worldviews, and delineate whether and how such divergence of worldviews may engender epistemic injustices. Through this process of attentive re-reading and critical reflection, I seek to uncover the underlying narratives that offer alternative views and perspectives on the effectiveness, limitations, and implications of ESD as a theoretical concept.

I am acutely aware of the prospect of (mistakenly) identifying clashes or tensions in situations where they may not actually exist, which could lead to misinterpretations or misrepresentations of the complexities inherent in the discourse surrounding ESD. Additionally, I also understand that pitching worldviews against each other, creating dichotomies, and evaluating one against the other is problematic, simplistic, and reductionist and this compartmentalised thinking is also rooted in certain epistemic paradigms. This apprehension is compounded by the recognition that issues concerning sustainability and education are multifaceted, influenced by numerous factors. Moreover, this complexity is heightened by the global nature of the ESD project set within a diverse global landscape. Therefore, I am determined to approach this study with sensitivity and discernment, avoiding oversimplifications or binary categorizations that may obscure the true complexities of the issues at hand. By remaining vigilant and open in my exploration of critiquing narratives, I aim to mitigate the risk of misinterpretation and ensure a more nuanced understanding of the dynamics within the field of ESD.

Established knowledge frameworks, often rooted in Western traditions and hegemonic ideologies, have historically held sway over academic discourse and institutional structures (see, Chapter 2). It also means that my own positionality in this context is both influential and subject to scrutiny. As a product of mainstream education, my perspectives and biases are inevitably influenced by dominant paradigms and ideologies that have shaped the educational systems I have been exposed to. The education I received in humanities, while providing valuable insights, may also reflect certain biases inherent in the prevailing cultural and educational frameworks. Additionally, my background as a woman from the Global South, now living in the Global North, brings an array of social, cultural, and experiential baggage that I am acutely aware of. These intersecting identities and experiences contribute to my worldview and may influence my interpretations and analyses. This intersectionality of influences underscores the need for critical self-reflection and interrogation of my own positionalities and biases as I engage in epistemological inquiry. It also needs to be highlighted that, I perceive my intersectional identity not solely as a limitation but also as strengths that enrich my perspective and enhance the depth of my analysis. In essence, as a researcher, I am acutely aware of the potential biases and perspectives that I bring to this dialogue, and I am committed to approaching this research with humility, reflexivity, and a willingness to critically examine my own assumptions and biases.

I am also mindful of the constraints inherent in my chosen methodological approach and the inherent limitations of a conceptual paper of this nature. While my methodological approach allows for a thorough exploration of theoretical concepts and critical analysis of existing literature, it also has inherent limitations in terms of empirical data collection and verification. Additionally, as a conceptual paper, there are boundaries to the depth and breadth of analysis that can be achieved within the confines of theoretical frameworks and existing literature. Moreover, I am also cognizant of the limitations imposed by my chosen theoretical framework. While Miranda Fricker's theory on epistemic injustice and the framework on epistemic injustice developed by Cummings, et. al. (2023) provide valuable

insights and guidance for my analysis, I acknowledge that there may be other theories or conceptual frameworks that could offer different perspectives or better suit the objectives of my research. I believe it is important to acknowledge these limitations and to approach the research with reflexiveness. This awareness underscores my commitment to conducting rigorous and comprehensive research, aimed at generating meaningful insights and advancing scholarly understanding within the field of education.

1.7 Overview of chapters

Offering here an orientational guide of each section in this thesis:

I. Chapter 1, titled “Introduction”, serves as the entry, setting the context and establishing the relevance of the research topic. It outlines the overarching research aims and objectives, rationale for adopting a theoretical framework rooted in Miranda Fricker's theory on epistemic injustice as well as briefly expanding on my methodology. Additionally, Chapter 1 offers a brief overview of the subsequent chapters, providing readers with a roadmap for the rest of the thesis.

II. Chapter 2, titled “Literature Overview”, provides a comprehensive examination of relevant scholarly literature. Through an in-depth review of the literature, Chapter 2 aims to contextualize the research within existing scholarship, identify key gaps, and lay the groundwork for the subsequent analysis.

III. Chapter 3, titled “Theoretical Lens” elucidates Miranda Fricker's theory on epistemic injustice as a foundational theoretical framework, supplemented by subsequent developments in her work. This framework serves as the basis for exploring the epistemological tensions inherent in the critique of ESD.

IV. Chapter 4, titled “Methodology”, outlines the systematic review methodology, delineating the process used to identify, select, and analyse relevant literature. This includes detailing the search strategy utilized to gather relevant literature, specifying the inclusion and exclusion criteria applied to screen and evaluate potential sources, and explaining the approach taken to adhere to PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines for data analysis and quality assessment. By systematically documenting the methodology employed in conducting the review, Chapter 4 ensures transparency and reproducibility while facilitating the synthesis and interpretation of findings in subsequent chapters.

V. Chapter 5, titled “Results”, presents the findings of the systematic review, offering both visualizations and narrative commentary to synthesize the results. This chapter meticulously categorizes the ESD critiques found in literature thematically, organizing the synthesized information into coherent themes or categories based on recurring patterns, similarities, and differences identified across the reviewed literature. Through visual representations as well as narrative commentary, Chapter 5 provides an overview of the key insights gleaned from the systematic review process.

VI. Chapter 6, titled “Discussion”, constitutes the discussion section, where the findings from the systematic review are critically analysed and interpreted in light of the research questions and the theoretical framework adopted. By synthesizing the literature vis-a-vie the theoretical framework, Chapter 6 aims to offer insights, interpretations, and recommendations that contribute to advancing knowledge in the field and informing future research and practice.

VII. Chapter 7, titled "Conclusions and Ways Forward," serves as the culmination of the research project. In this chapter, the key findings and insights drawn from the systematic review and subsequent discussion are synthesized to provide overarching conclusions. The conclusions reflect upon the research questions, theoretical framework, and empirical evidence presented throughout the study as well as offer recommendations based on the conclusions drawn.

2 Literature overview

> "Knowledge and justification are not only interesting in their own right as central epistemological topics; they also represent positive values in the life of every reasonable person. For all of us, there is much we want to know. We also care whether we are justified in what we believe—and whether others are justified in what they tell us. The study of epistemology can help in this quest, even if it often does so indirectly. Well-developed concepts of knowledge and justification can play the role of ideals in human life: positively, we can try to achieve knowledge and justification in relation to subjects that concern us; negatively, we can refrain from forming beliefs where we think we lack justification, and we can avoid claiming knowledge where we think we can at best hypothesize. If we learn enough about knowledge and justification conceived philosophically, we can better search for them in matters that concern us and can better avoid the dangerous pitfalls that come from confusing mere impressions with justification or mere opinion with knowledge. The more we know about the constitution of knowledge and justification, the better we can build them through our own inquiries, and the less easily we will fall into the pervasive temptation to take an imitation to be the real thing." (Audi, 1998, p. 10)

In this chapter, literature relevant to the topic is discussed paying closer attention to epistemic injustice and its relevance to both education and sustainability education. *Routledge Handbook on Epistemic Injustice* (2007) has been an invaluable source in this endeavour, providing significant insights and shaping the discourse on epistemic injustice. I must admit, given the vastness of the literature on this topic, relying on this source has been immensely beneficial in maintaining focus and direction. I justify this selection by highlighting the inclusion of esteemed and extensively cited academics who possess expertise in the subject areas, as well as the comprehensive scope afforded by this handbook. While I am mindful of the potential limitations and shortcomings inherent in presenting a relatively concise literature list, I remain hopeful that its relevance to the topic will sufficiently establish the conceptual background required for conducting my study effectively.

In this chapter, I aim to map multiple lines of inquiry. Firstly, I provide a brief overview of ESD as a global policy. Then, I examine the field of epistemology, elucidating its constraints, which have led to the emergence of investigations into epistemic injustice. Subsequently, I delved into Fricker's seminal work on epistemic injustice (2007), followed by an exploration of more recent scholarship that has extended and developed her foundational insights. In the following section, I attempt to delineate the intersections between epistemology and education, elucidating how contentious epistemic inquiries within the realm of education can engender epistemic injustice. This inquiry holds particular relevance given the contentious debates surrounding ESD constitute a focal point of examination in this study. In the concluding section, I explore ESD as a global policy initiative operating within an inherently diverse and inequitable global setting. In order to underscore this diversity, I examined a multitude of studies spanning across various dimensions that underscore the global diversity including gender, culture, race, education, science, and philosophy. Through this exploration, I investigate how the diversities inherent within the global landscape intersect with epistemic injustice, thereby delineating their implications for a global policy such as ESD. Collectively, this body of scholarly work will furnish the requisite insights for delineating potential instances of epistemic injustice within the analysis of ESD critique.

2.1 ESD

Within the framework of the 2030 agenda for Sustainable Development (SD) and Sustainable Development Goals (SDGs), the United Nations (UN) tackles urgent global sustainability issues, including climate change, biodiversity depletion, poverty, restricted access to fundamental education, and inequity. The SDGs, essentially, represent a holistic framework aimed at promoting worldwide cooperation to nurture a healthier planet and a more just global society. In this context, ESD is regarded as crucial, with the UN acknowledging it as "a fundamental facilitator for achieving all the other SDGs" (UNESCO, 2019, p. 1). The United Nations Educational, Scientific and Cultural Organization (UNESCO), thus, emphasizes the need for sustainable development to be embedded at every educational level (Leicht et al., 2018). ESD is described as a form of "transformative education" (UNESCO, 2014, as cited in, Leicht et al., 2018, p. 7), aspiring to foster educational outcomes that encompass critical and systemic thinking, collaborative decision-making, and a sense of responsibility toward both present and future generations (Leicht et al., 2018, p. 7). Learners actively involved in ESD are envisioned as critical thinkers who are equipped to systematically cultivate cognitive, affective, and psychomotor skills, as well as values and attitudes necessary for nurturing a more inclusive and equitable society (Leicht et al., 2018). Leicht et al. highlight that the goal of ESD is to ensure that by 2030, all learners possess the knowledge and competencies vital for advancing SD. This encompasses, but is not limited to, education on sustainable development, sustainable lifestyles, human rights, gender equality, the advocacy for peace and non-violence, global citizenship, and the appreciation of cultural diversity and its role in sustainable development (Leicht et al., 2018, p. 25).

Essentially, the SDGs and ESD entail a commitment to social justice. UNESCO's commitment to advancing social justice through the SDGs and ESD is commendable and its need cannot be denied, especially considering the complex interplay between the causes and consequences of current crises and inequality. (Boyce, 1994; Green & Healy, 2022; Hornborg, 2021; Islam & Winkel, 2017; Wiedmann et al., 2020; also refer to OXFAM, 2019, as cited in, Bylund, 2023). This inequality is evident not just in social, political, and economic domains but also in epistemic realms (Demeter 2020; Go 2017; Kidd, et al., 2017; Morgan et al. 2018; Silva Filho et al. 2023). Addressing these various forms of inequality, including epistemic inequality, is crucial for achieving social justice. It becomes an imperative in the achievement of goals set by the SDGs and the ESD agenda.

2.2 Epistemology

Epistemology, to put simply, can be conceived as the theory of knowledge and justification. It pertains to a branch of philosophy concerned with the theory of knowledge. The term “epistemology” comes from the Greek words, “episteme” (translation: “knowledge”, “understanding”) and “logos” (translation: “argument” or “reason” or “ground for belief” or “study of”) (Steup & Neta, 2020). As late as the 17th century, there was no single term referring to “epistemology”, indicating its relatively recent emergence as a defined field (Niiniluoto, Sintonen, and Woleński, 2004). In fact, according to Potter (2017, as cited in, Sol & Heng, 2022), the term "epistemology" was coined by the Scottish philosopher James Frederick Ferrier (1808–1864) in the mid-19th century. However, despite the term’s recent coinage,

epistemology's roots extend as far back as any other branch of philosophy (Niiniluoto et al., 2004). Epistemology, broadly, delves into a multitude of inquiries and interconnected philosophical themes. Traditional epistemological questions can include questions such as, "what is knowledge?; Is knowledge based on senses or reason?; Is certainty attainable?; What is truth?; Are there ultimate limits of knowledge?; What are sources of knowledge?; What do we know?; What differentiates knowledge from wisdom and opinion?;" etc. (Niiniluoto et al., 2004; Sol and Heng, 2022). While various view exist regarding the criteria for defining knowledge, the notion of justification as to what is considered as valid/ true knowledge, stands at the core of the inquiry.

It is contended that, the traditional Anglo-American approach to epistemology, which primarily focuses on defining what qualifies as knowledge and how it is justified as exemplified by the above questions, has often neglected to consider the ethical and political dimensions inherent within the concept of knowledge itself and the modes of its justification (Fricker, 2007). Our epistemic practices do not take place within a vacuum; Rather, they are deeply embedded within complex social, cultural, and historical contexts that significantly shape their nature and outcomes. Accordingly, Fricker (2007), in her seminal book titled, *Epidemic Injustice: Power and Ethics of Knowing* (2007), attempts to underscore the ethical and political dimensions inherent in our everyday epistemic practices. In doing so, she attempts to reveals the social-power dynamics that are inherent to out epistemic conduct. She highlights that, what is conceived as "episteme trust," as defined as "the trust in communicated knowledge" (Li et al. 2023), for instance, has an intractable relation to social power. Accordingly, social disadvantage can lead to unjust epistemic disadvantage (Fricker, 2007, p. 2). In other words, Fricker (2007) contends that, the traditional pursuit of epistemology has been limited by the absence of a theoretical framework capable of uncovering the ethical and political dimensions inherent in our epistemic behaviours (with only a few exceptions such as feminist epistemology, critical race theory). This recognition underscores the need for critical examination of the power structures at play within epistemic realms to ensure fairness and equity in our epistemic practices.

According to Fricker (2007), postmodernism initially appeared promising as a potential avenue within philosophical literature for exploring the ethical and political dimensions of our epistemic practices given that postmodernist thought offered a framework that situated reason and knowledge within the realm of social power, providing a platform for addressing longstanding concerns about the authority of reason in a more politically charged context. However, according to Fricker (2007), this hope proved largely unfounded, as much of postmodernist discourse tended towards reductionism, prioritizing disillusionment with idealized notions of reason over a genuine engagement with questions of justice and injustice within the dynamics of social power. Fricker (2007) contends that the suspicion directed towards the category of reason itself, often leading to its reduction to a mere operation of power within postmodernist discourse, pre-emptively undermines crucial inquiries into the influence of power on our rational functioning: "If one has an interest in how questions of justice might present themselves in relation to our epistemic practices, then the reductionist tendency obscures essential distinctions between, say, rejecting someone's word for good reason and rejecting it out of mere prejudice" (Fricker, 2007, p. 3). Essentially, this tendency blurs the distinction between 'reasoned judgments' and those influenced solely by prejudice, hindering the examination of questions regarding justice in relation to our epistemic practices. Accordingly, she claims that, rather than fostering a theoretical space for exploring these issues, postmodernism's reductionist approach obscures essential distinctions, ultimately detracting from progressive epistemological inquiry and leaning towards conservatism. It is against this backdrop that her seminal work on epistemic injustice emerges.

2.3 Epistemic injustice

According to Pohlhaus, Jr. (2017) the notion of "epistemic injustice" serves as a nexus, amalgamating insights from three principal branches of philosophy: political philosophy, ethics, and epistemology. This interdisciplinary framework facilitates an exploration of how epistemic practices and institutional arrangements may be structured and operationalized in a manner that not only deviates from certain foundational epistemic virtues, such as truth and understanding, but also perpetrates injustices against particular agents of knowledge. Pohlhaus, Jr. (2017) contends that the examination of the ethics and politics inherent in knowledge practices is a longstanding project within philosophical discourse. For instance, feminist, critical race, and decolonial philosophers have engaged in this critical inquiry for an extended period of time. Their contributions form a part of a broader historical trajectory of epistemic resistance, "through identifying and calling attention to ways in which knowers have been wronged in their capacities as knowers" (Pohlhaus, Jr., 2017, p. 13). Given that there is an explicit understanding that these "wrongs" stem from our epistemic practice or given how our epistemic institutions are structured, Pohlhaus, Jr., maintains that "epistemic injustice can be understood as epistemic" (2017, p. 13) in at least three ways: (1) they wrong particular knowers as knowers; (2) they cause epistemic dysfunction; and (3) they cause wrong (1) and (2) through the use of our epistemic practices and institutions. Thus, "an epistemic injustice not only wrongs a knower as a knower, but also is a wrong that a knower perpetrates as a knower, and that an epistemic institution causes in its capacity as an epistemic institution" (Pohlhaus, Jr., 2017, p. 13).

In her seminal work, Fricker (2007) defines epistemic injustice as "a wrong done to someone in their capacity as a knower" (p. 1). It pertains to the notion that individuals may experience unjust discrimination in their role as knowers due to biases related to various attributes of the speaker, including but not limited to, gender, social status, ethnicity, race, sexuality, tone of voice, accent, etc. (Byskov 2021). Fricker posits two distinct manifestations of epistemic injustice: **testimonial injustice** and **hermeneutical injustice.** Testimonial injustice occurs when the credibility of a speaker's statement is unfairly influenced by prejudices related to factors such as gender, social background, ethnicity, race, sexuality, tone of voice, or accent etc. This injustice wrongs individuals in their capacity as speakers or knowers, as the credibility assigned to their testimony is not based on relevant considerations, but on biases unrelated to the speaker's credibility. Consequently, individuals subjected to such prejudices face obstacles in effectively communicating their knowledge to those who are not similarly affected. Epistemic disadvantage carries a multiplicity of implications and can manifest in various ways. Fundamentally, "[t]o be wronged in one's capacity as a knower is to be wronged in a capacity essential to human value. When one is undermined or otherwise wronged in a capacity essential to human value, one suffers an intrinsic injustice" (Fricker, 2007, p. 43). What she undermines is that, to be wronged as a knower is to be deprived of an essential aspect of human value, resulting in intrinsic injustice.

Pohlhaus, Jr. (2017, p. 16-22) explores various manifestations of epistemic injustice through four distinct lenses which I will attempt to summarise bellow. Each lens offers a unique perspective for discerning and analysing the interplay between epistemic agents and institutions in their capacity to both harm knowers and compromise fundamental epistemic values. Pohlhaus, Jr. (2017) cautions that these four lenses represent only one approach among many possible frameworks for examining epistemic

injustices. Furthermore, he contends that certain instances of epistemic injustice may transcend singular lenses, necessitating a more nuanced understanding that considers the multifaceted nature of their effects and implications, which is a crucial contention for this study.

I. Lens one: Social contract and coordinated ignorance

This lens highlights the way in which a knower may be systematically subject to injustice in a, "general sense" (p. 16). Within this lens, epistemic injustices are perceived as intricately intertwined with and reinforced by prevailing relations of dominance and oppression. Using Charles Mill's (2007), "analysis of the nonideal conditions that maintain white supremacy in the United States as a racial contract" (p. 16), the author discusses the ways in which such (racial or gender) social contracts create two epistemic classes of people thereby sustaining systems of asymmetrical power where marginalised individuals, be it non-white males or women etc., are harmfully positioned as less competent knowers. Classic examples provided by Pohlhaus, Jr. (2017) include instances "where laws prohibiting blacks from testifying against whites in a court of law as was upheld by the U.S. Supreme Court in *Blyew vs. U.S* (1871)" and, "the systematic dismissal and ignorance of Black American intellectual traditions as properly philosophical (Outlaw 2007)" (p. 17). This form of unjust social contract may lead to individuals in positions of dominance to cultivate a form of "epistemic arrogance" and "epistemic laziness" whereby, epistemic attention is used in service of the dominance, ultimately leading to ""hermeneutical ignorance" or the propensity to dismiss whole aspects of the experienced world by refusing to become proficient in the epistemic resources required for attending to those parts of the world well" (Pohlhaus, Jr., 2012, as cited in, Pohlhaus, Jr., 2017, p. 17). Ultimately, the perspective afforded by the lens of the (gender or racial) social contract underscores the systematic injustices inflicted upon knowers by epistemic institutions and practices.

II. Lens two: Interdependence and epistemic relations

This lens considers the ways in which knowers' intersubjectively positioned selves can have implications for epistemic injustice. Commencing from a view that knowers are constituted in relation, this lens examines, (1) "stymie epistemic relations" which can be defined as "exclusions that keep epistemic agents isolated from one another without warrant" (p. 18) and (2) "those that manifest in breaches of trust" (p. 22). An example of the first form of injustice could be exclusions that prevent epistemic agents from engaging in communal epistemic activities such as education, healthcare, politics, and science. The second unjust may manifest in situations where communities with a history of harm from certain epistemic institutions may exhibit reduced trust in them, hindering their ability to derive epistemic benefits that others who have not been subject to historic harm may enjoy. This breach of trust, resulting in a population's scepticism towards communal epistemic institutions, represents an instance of epistemic trust injustice (p. 18).

III. Lens three: Degrees of change and/in epistemic systems

The degree of change lens illustrates that, "there are distinct forms of epistemic oppression that are not reducible to social and political factors, but rather derive from epistemic systems themselves" (Dotson, 2014a, p. 116, as cited in, Pohlhaus, Jr., 2017, p. 19). This lens identifies three orders of exclusion: the first-order includes, "testimonial injustices" and "non-testimonial epistemic practices" where the "epistemic agent is unfairly prevented from participating fully within epistemic systems owing to an unfair distribution of epistemic power due to unwarranted credibility deficits and assessments of competency" (p. 19-20). Second-order epistemic exclusions take place due to a wrong within the

epistemic system itself leading to what Fricker (2017) identifies as, “hermeneutical injustice”. Third-order exclusions take place when, “an epistemic system is functioning properly and is sufficiently developed, but the system itself is altogether inadequate to a particular epistemic task” (Dotson, 2014a, p. 129–131, as cited in, Pohlhaus, Jr., 2017, p. 20). The argument posits that third-order epistemic exclusions cannot be solely attributed to social and political factors, as these exclusions can be perpetuated by the systems themselves leading to a form of “wilful hermeneutical ignorance” by the systems.

IV. Lens four: Epistemic labour and knowledge production

This views epistemic injustice through the lens of epistemic labour and knowledge production. Injustices can be broadly categorised into three categories: “epistemic agential injustices”, “epistemic labour invalidation” and “epistemic exploitation”. Examples of such injustices include when, “controlling images” (Collins, 2000, p. 69-90, as cited in, Pohlhaus, Jr., 2017, p. 21) imposes unequal cognitive burdens on marginalized groups, constituting an epistemic agential injustice by adding cognitive labour that impedes their epistemic activity compared to non-stereotyped counterparts. Another example illustrating this point is the invalidation of knowledge concerning non-Western philosophical traditions within disciplines, to the extent that possessing such knowledge can diminish a knower’s credibility as a philosopher (Olberding, 2016, as cited in, Pohlhaus, Jr., 2017, p. 21).

These various lenses through which epistemic injustice can be considered exemplifies the complexities that surround this topic. Navigating through these lenses reveals that focusing on different facets of our epistemic existence will illuminate varying manifestations of epistemic injustice. Furthermore, shifting focus will underscore perspectives on the interrelations among these injustices. Thus, it is imperative, when considering the ethical and political dimensions of our epistemic existence, not to close off the potential for identifying and addressing different forms of epistemic injustice, nor to prevent other knowers from bringing attention to them as they emerge. Moreover, it is also necessary to consider how these insights relate to a global policy such as ESD. Essentially, these multiple lenses reveal a complex epistemic terrain where injustice may manifest in manifold ways. Consequently, it could be argued that these complexities are heightened within global policymaking, where decisions exert extensive influence on diverse and unequal populations. This recognition holds significant weight when considering the implementation of a global policies such as ESD, a point I will delve into more in the subsequent section.

2.4 Epistemology, epistemic tensions, disagreements, injustice, and the academia

Recent developments in epistemology have placed greater emphasis on the social aspects of knowledge (Siegel 2004). Education, as a significant social domain where knowledge takes a central place, has garnered increased attention and scrutiny, too. Philosophy of education has a longstanding tradition of addressing the epistemological complexities inherent in educational theory and practice, alongside moral, metaphysical, social-political, and mind/language considerations (Siegel 2004). Nevertheless, there has been a growing convergence between topics explored in mainstream epistemology and those in philosophy of education with contemporary epistemological inquiries finding parallels in educational

theory (Carter et. al., forthcoming, p. 1): “For example, just as epistemologists ask about our epistemic aims (aims we have from a purely epistemic point of view) so philosophers of education ask what kinds of cognitive goods and traits an education should aim at inculcating. Thus, the matter of what makes knowledge valuable to possess—just to take one example of many—is a matter that falls squarely within the purview of both epistemological and educational disciplines” (Carter et. al., forthcoming, p. 1). Essentially, this convergence indicates, “an increased willingness to take seriously the philosophical problems raised by the ubiquitous social/communal effort to transmit/ transform culture(s) by way of education” (Siegel, 2004, p. 129).

According to Siegel (2004), these philosophical issues span across various sub-disciplines, encompassing core areas such as epistemology, metaphysics, ethics, social-political philosophy, and the philosophies of mind and language. The author outlines some key epistemological problems concerning education and posed below are some of them:

i. What is the fundamental epistemic aim(s) of education? This question has been explored by numerous scholars, with some arguing that education should aim for "truth," "rationality," or "critical thinking," while others consider the possibility of singular, multiple, or combined aims. (p. 129-130)

ii. Should students accept the testimonial pronouncements of their teachers? Should they trust, and accept without further justification, those pronouncements? If so accepted, are the resulting beliefs justified, and are the students/believers justified in so believing? (p. 130).

iii. Is indoctrination avoidable, or is it inevitable? If the latter, is it as a consequence not necessarily or always something to be avoided? Why should we value educational processes that result in student ability to subject candidate beliefs to critical scrutiny? Should we value them at all? (p. 132)

iv. How are we to understand such cultural divergence? Are some such values “absolutely” or “objectively” correct, while others are incorrect and should not be valued even though they in fact are? Or is such correctness relative to culture? Or is there some sort of pluralistic middle ground to be had here? (p. 133)

v. Issues of social justice in education: should multiculturalism be embraced? Can a “universalistic,” culturally transcendent defence of multiculturalism be coherently defended, or is it rather an example of just the sort of totalizing, hegemonic imposition that multiculturalism is meant to reject? Do educational efforts aimed at fostering critical thinking mistakenly understand and wrongly treat some students and groups by imposing upon them the beliefs, epistemic values and epistemic standards of the dominant majority culture, thus denying the actual differences among them that should be acknowledged and valued rather than denied or rendered invisible? Is reason itself just “one more ideology”? Does that value have any more than “local” value or relevance? (p. 133-134)

While this study does not seek to provide answers to these questions, they remain highly relevant. What I aim to underscore through this inquiry is the multitude of questions that emerge at the intersection of epistemology and education.

More importantly, what I wish to highlight is that these questions are contentious, reflecting the complexity of the issues involved. There are no singular and universally accepted answers to these questions. This leads us to consider, what is termed as “epistemic disagreements” and “epistemic tensions” within this study. A disagreement becomes "epistemic" when it is explicitly, about something overtly epistemic in character. For example, when it is about whether a proposition is justified or an epistemic principle is true” (Smith and Lynch, 2021, p. 971). Within this study, epistemic disagreements are considered in terms of, “peer disagreement, which is an idealized (or at best rare) kind of disagreement between individuals with roughly the same evidence and cognitive capacities” (Broncano-Berrocal and Simion, 2021, p. 14642). Although there exists a complex array of studies on peer disagreements, in this study, I aim to adhere to its most simple definition: “a state of affairs in which two or more epistemic peers disagree about a proposition” (Director, 2021, p. 6). The epistemic importance of disagreement lies not in the significance of the positions held or the reasons behind them, but solely in the fact that the issue is under dispute (Martin, 2019). Essentially, the mere existence of disagreement holds epistemic weight independent of the specific viewpoints or their justifications; within this context, epistemic tensions underpin epistemic disagreements and highlight the fundamental conflicts in knowledge claims and their justifications. Alternatively, they can also be viewed as representing implicit and explicit contestations or varying degrees of the same epistemic conflict, where epistemic tensions reflect the underlying disagreements, and epistemic disagreements are the overt, clearly articulated disputes. Recognizing and addressing the epistemic dimensions of both aspects, can lead to a deeper understanding of the issues at hand.

Moreover, it is important to consider the ways in epistemic disagreements may lead to epistemic injustice. It is imperative to understand that the contentious nature of epistemic disagreements is further amplified when we consider the socio-political context and epistemic systems within which they arise and are addressed. It adds another layer of complexity to the issues at hand. How can we contextualize these inquiries within the framework of epistemic injustice? To address this question, let us consider the arguments forwarded by Collins (2017) with regards to intersectionality and epistemic injustice in examining the trajectory of Black feminist struggle. The term intersectionality, “references the critical insight that race, class, gender, sexuality, ethnicity, nation, ability and age operate not as unitary, mutually exclusive entities, but rather as reciprocally constructing phenomena that in turn shape complex social inequalities” (Collins, 2015, as cited in, Collins, 2017, p. 115). Collins posits that the quest for Black women's liberation necessitated a comprehensive response to intersecting systems of oppression. Given the intricate link between social justice and epistemic justice, advocating for oneself within Black feminism not only generated novel insights from the perspective of Black women, but also served as a means of challenging existing norms of epistemic injustice through the exercise of epistemic agency. Moreover, intersectionality seemed to gain greater acceptance within academic circles when Black women and other marginalized social actors opted not to highlight knowledge forms that empowered them in social movement contexts. This pressure often led to the production of a depoliticized and fragmented version of intersectionality. Collins concludes that, “the term intersectionality simultaneously created possibilities for new ways of thinking, yet homogenized the field by silencing, erasing and thereby marginalizing some perspectives” (p. 117). Essentially, epistemic injustice “contributed to the specific trajectories that intersectionality that actually took” (p. 17) within the academia thereby reducing its emancipatory possibility.

Through this exploration of intersectionality's journey within academia, what Collins (2017) underscores is the manner in which epistemic injustice operates within academic institutions. Although,

in theory, the academia portrays itself as a democratic community of scholars founded on testimonial inclusivity, the reality diverges significantly from this ideal, with actual academic communities often characterized by epistemic injustice. Consequently, "interpretive communities, through their epistemic practices, govern and perpetuate unequal relationships of epistemic agency among their members" (p. 121). Collins argues that this happens via epistemic practices such as, "patterns of citation, themes of journal articles, articles selected for, invitations to deliver keynote addresses and the composition of panels at academic conferences" (p. 121), that ultimately control the narratives thereby reinforcing "their own point of view while ignoring and suppressing alternative perspectives" (p. 121). Collins (2017) contends that, because academics are neither equal in their ability to give testimony nor do they receive testimony in the same way, speaking from the bottom takes more skill and effort than speaking from the top. Race, gender, class, ethnicity and sexuality, singularly and in varying combinations, structure social interactions, not solely in the abstract, but also by structuring the social inequalities within colleges and universities. As a result, normative and ostensibly normal epistemological practices privilege the epistemic agency of well-established social actors. (p. 121). Essentially, conventional epistemological practices, which are often perceived as standard or normative within academic and societal contexts, tend to confer greater epistemic authority to individuals who hold positions of power or privilege within established social structures or adhere more closely to the standards of academic conventions. As a result, their knowledge is often given more weight and legitimacy within epistemic frameworks, while marginalized voices and alternative forms of knowledge are further marginalized or disregarded. This privileging of certain epistemic agents reinforces existing power dynamics and perpetuates epistemic injustices within academic and broader societal domains.

This argument holds significant relevance for the present study. For instance, consider the global academic landscape rife with diversity and inequality, particularly concerning access to resources, funding opportunities, and research visibility, all intertwined with the complexities of intersecting academic identities. If we are to consider the views posited by Collins (2017) within this context, it could be argued that the very global nature of ESD initiatives could make it susceptible to perpetuating epistemic injustices: Collins highlights how conventional epistemological practices tend to privilege certain individuals based on their social position and reinforce existing power dynamics. Within the realm of ESD, which operates on a global scale and intersects with diverse cultural, social, and economic contexts, these dynamics may become even more pronounced. The unequal distribution of resources, funding opportunities, and research visibility across different regions and communities could exacerbate epistemic inequalities within the ESD discourse. Moreover, the dominance of certain perspectives and knowledge systems within global policy-making processes may marginalize alternative voices and perpetuate epistemic injustices. This argument bears critical significance for this study.

This study aims view critique surrounding ESD from an epistemic lens thereby highlighting epistemic tensions embedded within such critique, and examines the ways in which such tensions may lead to epistemic injustice. This examination delves into the academic discourse surrounding ESD and the associated caveats. While I do not contend that all those who critique are marginalised or that they all hold marginalised perspectives, it remains plausible that their critique offers alternative viewpoints, a common trait of critical discourse. Essentially, what I seek to understand is whether ESD can engage with these alternative worldviews and the ways in which this engagement may lead to epistemic injustice. Ultimately, this inquiry delves into the potential inclusivity within the academic discourse surrounding ESD in relation to the broad spectrum of critical perspectives and alternative narratives. For this discussion, the above lines of inquiry are critical.

2.5 ESD, global diversity, and epistemic injustice

Considering ESD from a global policy perspective necessitates an exploration of the inherent diversity within our global landscape. In this section, I will explore how the various dimensions of global diversity such as gender, race, culture, education, science, philosophy, etc., intersect with epistemic injustice, thereby delineating their implications for ESD. For this purpose, I will attempt to summarise key insights from *Routledge Handbook on Epistemic Injustice* (2017) pertaining to gender, race, education, and culture and their intersections with epistemic injustice.

I. Feminist Epistemology. The subject of knowledge (Tuana, 2017)

Tuana (2017) explores the ways in which feminist epistemologists have interrogated the concept of "the subject of knowledge" across numerous domains, fields of study, and topics. The feminist critical examination of "the subject of knowledge" achieves dual objectives: firstly, it directs critical scrutiny towards how prevailing interests and values shape the epistemic priorities and significantly impact what qualifies as a legitimate "subject" of examination and inquiry. Secondly, it prompts critical reflection on the requisite characteristics of a subject to be perceived as a knowing subject. For example, using Genevieve Lloyd's work (1979, 1984), she illustrates how interpretations of reason within the annals of Western philosophy consistently overlook capacities traditionally associated with femininity, typically ascribed to women and marginalized men.

The fundamental contention is that, Western epistemic lineage, owing to its prejudiced notions of reason, is inherently unjust in its epistemology. This framework perpetuates the perception of certain groups as less than fully human, shaping not only whose knowledge is considered valuable, but also whose lives are deemed significant in the discourse of knowledge. Another illustration is found in the work of feminist scholars situated in postcolonial contexts. Drawing upon Linda Tuhiwai Smith's insights (1999), she elucidates how misconceptions regarding colonial subjects constitute a form of epistemic violence, denying these groups full humanity. As Linda Tuhiwai Smith articulates, "we were not 'fully human'; some of us were not even considered partially human" (1999, p. 25, as cited in, Tuana, 2017, p. 129). Through this form of epistemic violence, marginalised lives, and even entire populations, are construed as less valuable. If some lives do not qualify as lives within epistemological frameworks, the very foundation of knowledge construction is called into question, revealing the inherent biases and exclusions embedded within these frameworks. In her study, Tuana (2017) also highlights the liberating possibilities inherent in feminist and other liberatory epistemological approaches such as decoloniality in critiquing dominant western epistemologies. These approaches are shaped by diverse methods of critically interrogating "the subject of knowledge" across various dimensions of oppression. They emphasize the interconnectedness of gender, sexuality, ability/disability, race, ethnicity, class, nationality, religion, and other factors, thereby offering a more comprehensive understanding of knowledge dynamics.

II. Decolonial praxis and epistemic injustice (Pitts, 2017)

In “Decolonial praxis and epistemic injustice”, Pitts (2017) delves into the mechanisms through which global geopolitics of knowledge generates, conceals, and safeguards epistemic injustices in the face of

efforts to resist dominant knowledge paradigms. Pitts underscores the ways in which "decolonial thought and praxis critically unveil the production and dissemination of knowledge (implicating universities, academic presses, research institutes, and a wide range of networks and agencies involved in "intellectual production") within the material context of colonialism, imperialism, and capitalism" (p. 150). Pitts emphasises that institutions like universities, academic presses, and research institutes, along with the diverse networks involved in intellectual production, are all situated within specific social and historical contexts, and that the varied practices related to knowledge production and dissemination are situated within distinct political and cultural contexts, each shaped by unique relationships with colonialism, imperialism, and capitalism. The study ultimately asks "how to produce disciplinary discourses from Anglophone North American academic institutions on the topic of a decolonial geopolitics of knowledge without perpetuating an Occidentalism and 'othering' of communities whose existences require a perpetual struggle against neoliberal economic expansion and epistemic hegemony" (p. 150).

III. Epistemic injustice in science (Grasswick, 2017)

Grasswick (2017) investigates instances of epistemic injustice within the structures and operations of science, one of the most influential avenues of knowledge production. Drawing upon insights from history, sociology, and philosophy of science, Grasswick delineates two overarching types of epistemic injustice within this realm. The first is "participatory epistemic injustice", which involves systematic marginalization and unfair exclusion of certain individuals from contributing to collective scientific endeavours. The second is "epistemic trust injustice", whereby specific groups of knowers are unjustly alienated from scientific institutions, rendering their reliance on these institutions less reasonable compared to others.

IV. Epistemic injustice and education (Kotzee, 2017)

Kotzee (2017) delves into the intersections of epistemic injustice and educational institutions, practices, and principles, examining how biases and unfairness can influence the credibility attributed by teachers to students as they evolve into epistemic agents. This exploration encompasses considerations such as the selection of social experiences included in curricula and crucial political inquiries surrounding policies aimed at fostering epistemic and social diversity within classrooms. He highlights some of the ways in which epistemic injustice can manifest within education some of which I will present below:

i. Epistemic injustice may manifest if teachers consistently underestimated learners' epistemic abilities based on prejudicial stereotypes associated with their identities within a specific context (or perhaps with children overall)

ii. Teachers may assign greater credibility to the perspectives of students belonging to epistemically advantaged groups thereby perpetuating epistemic injustice.

iii. At the level of testimony, teachers may frequently present literature, scientific discoveries, historical events, and cultural contributions of individuals from privileged groups more prominently than those from marginalized groups leading to epistemic injustice.

iv. In educational settings where admission policies are selective, there is a risk that fewer students from disadvantaged backgrounds may have the opportunity to enrol or gain acceptance into specific courses of study.

v. The issue of admission into specific courses of study, both at the school and university levels, may ultimately determines who assumes roles as educators, scholars, researchers, leaders, and prominent figures within academic spaces.

V. Indigenous peoples, anthropology, and the legacy of epistemic injustice (Tsosie, 2017)

Tsosie (2017) situates the notion of epistemic injustice within the intersection of law and ethics within the field of anthropology, particularly concerning historical and ongoing harms experienced by Indigenous communities. The enduring impacts of colonial and imperial histories continue to disadvantage these communities in various ways, some of which involve clear epistemic dimensions. For example, certain academic and scientific disciplines often prioritize social and epistemic practices that are insensitive or antagonistic to the values, perspectives, and concerns of Indigenous peoples.

VI. Epistemic injustice and cultural heritage (Pantazatas, 2017)

Pantazatos (2017) delves into the intersection of epistemic injustices and cultural heritage. The tangible and intangible elements of culture's heritage, such as artifacts, locations, biological remnants, music, literature, and more, are inherently rich in knowledge. They serve as testimonies from the past, possibly from one's ancestors, preserving and conveying experiences, events, values, and "forms of life," as well as collective methods of understanding them. Due to these factors, heritage is subject to debates involving ethicists, scientists, cultural resource managers, museums, other institutions, political figures, and Indigenous communities. Pantazatos (2017) delineates a distinct manifestation of participant perspective epistemic injustice, wherein the authoritative institutions integral to modern heritage management are accused of inadequately considering, preserving, interpreting, presenting, transmitting, or exerting control over aspects of cultural heritage without properly incorporating the perspectives of those to whom the heritage belongs. Pantazatos (2017) contends that this gives rise to a multifaceted epistemic injustice, impacting entire cultures rather than individual or group entities.

VII. Euroscepticism as an epistemology of ignorance (Alcoff, 2017)

Alcoff (2017) asserts that contemporary European philosophical traditions have their roots in, and sustain, epistemic injustices against non-European civilizations. These philosophical frameworks frequently exhibit a form of "Eurocentrism," reflecting a belief in a "transcendental delusion" that separates thought from its spatial and cultural origins, leading to the neglect of social and historical factors. The sociohistorical backgrounds of European philosophical traditions, and the broader cultural environments in which they exist, have been and continue to be marked by numerous manifestations of epistemic injustices, several of which have impacted philosophical inquiry. According to Alcoff, achieving epistemic justice may necessitate more than just a deeper exploration of philosophical traditions and concepts from diverse non-European contexts; it may also entail adopting self-critical reflection, a process informed by feminist, postcolonial, decolonial, and critical race theories.

2.6 Framing the relevance of the studies

Examining ESD from a global policy standpoint demands an exploration of the diversities present across our global terrain. These studies collectively delineate the manifestations of epistemic injustice

intertwined with individual and community identities and their positions within the global hierarchy from multiple point-of-views. Individually, the studies offer insights into how particular aspects of identity, such as race, gender, class, and nationality, intersect with systems of power and knowledge production to perpetuate inequalities leading to epistemic injustices. Moreover, these studies underscore the complex and interconnected nature of epistemic injustices. They reveal that the global epistemic community is characterized by inherent inequalities, and illustrate the myriad ways in which epistemic injustices can manifest across different contexts and domains. It highlights the imperative for ESD to recognize the inherent complexities and intersections of epistemic injustices within diverse socio-cultural contexts in the global landscape.

These studies, collectively, underscore the significance of recognising the reality of the contemporary academic terrain, which is inherently complex and is marked by inequalities. Navigating this landscape is no simple feat. Within such a milieu, presenting alternative viewpoints or occupying a marginal position can prove to be a formidable task, as emphasized by Collins (2017), Grasswick (2017), Kotzee (2017), Pantazatos (2017), Pitts (2017), Tsosie (2017) and Tuana (2017). This observation holds significant resonance within global policymaking initiatives like ESD, which intertwines academia and education with sustainability efforts. Within the realm of global policy formulation, where decisions hold sway over diverse populations with varying levels of access and privilege, the task of incorporating alternative viewpoints becomes even more difficult. This challenge is further compounded by the complex nature of the academic landscape, where diverse perspectives and competing narratives abound. Therefore, recognizing the intricacies of this diverse, yet unequal space becomes imperative in comprehending the nuanced ways in which epistemic injustice may manifest.

It is also essential to assert, if it is not already evident, that I advocate for epistemologies in the plural sense of the word. It emanates from the idea that, "there are many epistemological systems that have their own clusters of commitments, core myths, and operating rituals that aim at storying worlds for particular functions" (Berenstain et al., 2022, p. 312). I also oscillate between worldviews, epistemology, and epistemologies. It is in an attempt to affirm not only the interconnected facets of the same intellectual landscape but also my commitment to plurality. This also serves as a motivation to expand my analysis beyond the academia as highlighted by this literature review. Acknowledging that ESD scholars primarily operate within academia, I am aware of the temptation to confine my analysis to the academic realm and the epistemic injustices that are inherent to it. However, I maintain that epistemology and epistemic injustice transcends the boundaries of the academia. Rejecting the notion that knowledge is exclusively housed within academic spheres or that knowers only exist within the academia, I recognize the profound social implications inherent in epistemology and epistemic injustice.

To recapitulate, this thesis embarks on a systematic examination of the theoretical critiques of ESD. Specifically, it aims to study these criticisms through an epistemic lens, seeking to ascertain whether these critiques shed light on instances where ESD may perpetuate or give rise to epistemic injustices, emphasizing the pivotal role of epistemic justice as a prerequisite for achieving social justice. This line of inquiry is both innovative and imperative, particularly in light of the persistent inequalities within our epistemic communities as discussed in this literature over. The study's novelty lies in the absence of extant studies examining ESD through the lens of epistemic injustice. Its necessity, however, is underscored by ESD's overarching promise of social justice, an aspiration contingent upon addressing epistemic injustice as a foundational prerequisite. By interpreting critiques as gateways to alternative worldviews, the study not only views them as expressions of dissent but also as manifestations of underlying epistemic assumptions and perspectives where possible. Through this lens, this study

attempts to unravel the complex dynamics between diverse knowledges and ESD's potential to bridge their epistemic divides successfully. For this purpose, the insights gleaned from the studies that were discussed in this chapter are indispensable as they highlight the multiple ways in which epistemic injustice manifests in the global and academic landscape.

2.7 Summary

In this scholarly review, I have mapped multiple lines of inquiry. Firstly, I have examined the field of epistemology, elucidating its constraints, which have led to the emergence of investigations into epistemic injustice. Subsequently, I delved into Fricker's seminal work on epistemic injustice (2007), followed by an exploration of more recent scholarship that has developed her foundational insights. Particularly noteworthy was the delineation of multiple lenses through which epistemic injustice can be examined, emphasizing the complexities inherent within this concept. In the next section, I sought to delineate the intersections between epistemology and education, elucidating how contentious epistemic inquiries within the realm of education can engender circumstances conducive to the proliferation of epistemic injustice. This inquiry holds particular relevance given the contentious debates surrounding ESD constitute a focal point of examination in this study. In the concluding section, I addressed ESD as a global policy initiative operating within an inherently diverse and inequitable global milieu. In order to underscore this diversity, I examined a multitude of studies spanning various dimensions including gender, culture, race, education, science, and philosophy. Through this comprehensive exploration, I investigated how the diversities inherent within the global landscape intersect with instances of epistemic injustice, thereby delineating their implications for a global policy such as ESD. Collectively, this body of scholarly work will furnish the requisite conceptual insights for examining manifestations of epistemic injustice, as exemplified within the critical discourse of ESD.

3 Theoretical lenses

"What does the concept of epistemic injustice do for us? What should we want it to do? If meaning is use, then there is no point trying to put precise boundaries on the concept in advance; indeed its use has already evolved, spreading slightly more widely than originally intended, and for good reason." (Fricker, 2017, p. 53)

In this chapter, I delve into the theoretical lenses of this study, drawing upon Miranda Fricker's seminal work, *Epistemic Injustice: Power and the Ethics of Knowing* (2007), and subsequent developments in the field. Specifically, I employ the framework developed by Cummings et al. (2023), who, in their conceptual paper, "develop a new holistic framework of the positive space of epistemic justice and demonstrate its relevance to sustainable development" (Cummings et al. 2023:2). Recognizing the significance of their contributions, I integrate their holistic framework into my own theoretical framework.

3.1 *Epistemic Injustice: Power and the Ethics of Knowing* (Fricker, 2007)

Fricker, in *Epistemic Injustice: Power and the Ethics of Knowing* (2017), explores the idea that, "there is a distinctively epistemic kind of injustice" (p. 2). She recognises that there are a number of phenomena that could be listed under the umbrella of epistemic injustice such as injustices stemming from "distributive unfairness in respect of epistemic goods such as information or education" (p. 2). She clarifies that, while unfair distribution of epistemic goods such as education and information can be a form of epistemic injustice, what she attempts to explore in her book (2007) are "two forms of epistemic injustice that are distinctively epistemic in kind, theorizing them as consisting, most fundamentally, in a wrong done to someone specifically in their capacity as a knower" (p. 2). In her book, she originally identified two kinds of epistemic injustice, namely testimonial and hermeneutical injustice with their roots in imbalances between social and political power.

Testimonial injustice occurs when "prejudice causes a hearer to give a deflated [or inflated] level of credibility to a speaker's word" (Fricker, 2007, p. 2). Fricker employs an illustrative example involving a black man whose credibility is doubted by the police due to his race. This unjust treatment, where the credibility of the black individual is unfairly undermined, particularly by figures of authority such as the police, highlights the manifestation of testimonial injustice. Fricker (2007) provides vivid instances of identity prejudice in literature to elucidate testimonial injustice. These examples include the racially motivated disbelief faced by the accused, Tom Robinson, in Harper Lee's *To Kill a Mockingbird*, and the gender-related prejudice leading to disbelief of Marge Sherwood in Anthony Minghella's adaptation of Patricia Highsmith's novel, *The Talented Mr. Ripley*. In sum, testimonial injustice arises from biases

within the credibility system: it occurs when prejudiced attitudes influence the allocation of credibility, leading to unfair treatment of individuals or groups based on their identity characteristics.

Anderson (2012) distinguishes between **transactional testimonial injustice**, stemming from the identity prejudice of a discernible agent, and **structural testimonial injustice**, where institutions are inherently designed to exclude certain individuals without explicit decision-making. Additionally, Anderson argues that testimonial injustice is not solely rooted in identity prejudice, but is also entrenched in ethnocentrism and biases towards the shared reality of social groups. Anderson (2012) emphasizes that structural manifestations of testimonial injustice are more widespread than Fricker's analysis acknowledges, underscoring the need for structural solutions to address them. To comprehend this, it is imperative to move beyond the narrow lens of 'prejudice' in viewing testimonial injustice and to explore alternative mechanisms through which marginalized social groups may be unfairly denied credibility such as ethnocentrisms and "shared reality bias" (2012, p. 169) or the bias towards the shared reality of certain social groups.

Hermeneutical injustice, on the other hand, occurs "at a prior stage, when a gap in collective interpretive resources puts someone at an unfair disadvantage when it comes to making sense of their social experiences" (Fricker, 2007, p. 2). Fricker (2007) elucidates the notion of hermeneutic injustice using the example of the coinage of the term, "sexual harassment," which emerged in 1975. Prior to the coining of this term, women and other individuals experiencing sexual harassment encountered difficulties in articulating and describing their experiences of victimization. What this illustrates is a deficiency in our collective interpretive resources, a gap that hinders individuals from accurately understanding and communicating their experiences of harm. Fricker's analysis underscores the profound impact of hermeneutic injustice on marginalized groups, whose voices and narratives are often marginalized or dismissed within societal discourse. Anderson (2012) contends that hermeneutical injustice is inherently structural as it pertains to groups rather than individuals. Essentially, it is a form of epistemic injustice that stems from structural biases in the development of collective hermeneutical resources.

3.2 Holistic framework in epistemic injustice (Cummings et. al., 2023)

Cummings et. al. (2023), in developing their holistic framework in epistemic injustice, identifies additional concepts of epistemic injustice that can be found in literature: **explanatory injustice, epistemic attention deficit, epistemic network injustice, epistemic injustice of interpretive burden, crippled epistemologies, cognitive and communicative forms of hermeneutical injustice, communicative hermeneutical injustice, and linguistic injustice**. The framework developed by Cummings et. al. (2023) is the first attempt at developing a framework that merges the literature on epistemic injustice and sustainable development. They construct this framework in a hierarchical manner, interconnecting key concepts from existing literature within a hierarchical structure, serving as a heuristic tool. However, they acknowledge that in actuality, the interconnections among these concepts are more akin to a network rather than the hierarchical representation they have developed. This framework is the main analytical tool that guides this study. The facets of epistemic injustice outlined within the framework function as the cornerstone of the analytical approach, providing a structured framework for examining and interpreting the complexities of epistemic injustices within the context of

ESD. Figure 1 visually illustrates the holistic framework in epistemic injustice developed by Cummings et. al. (2023).

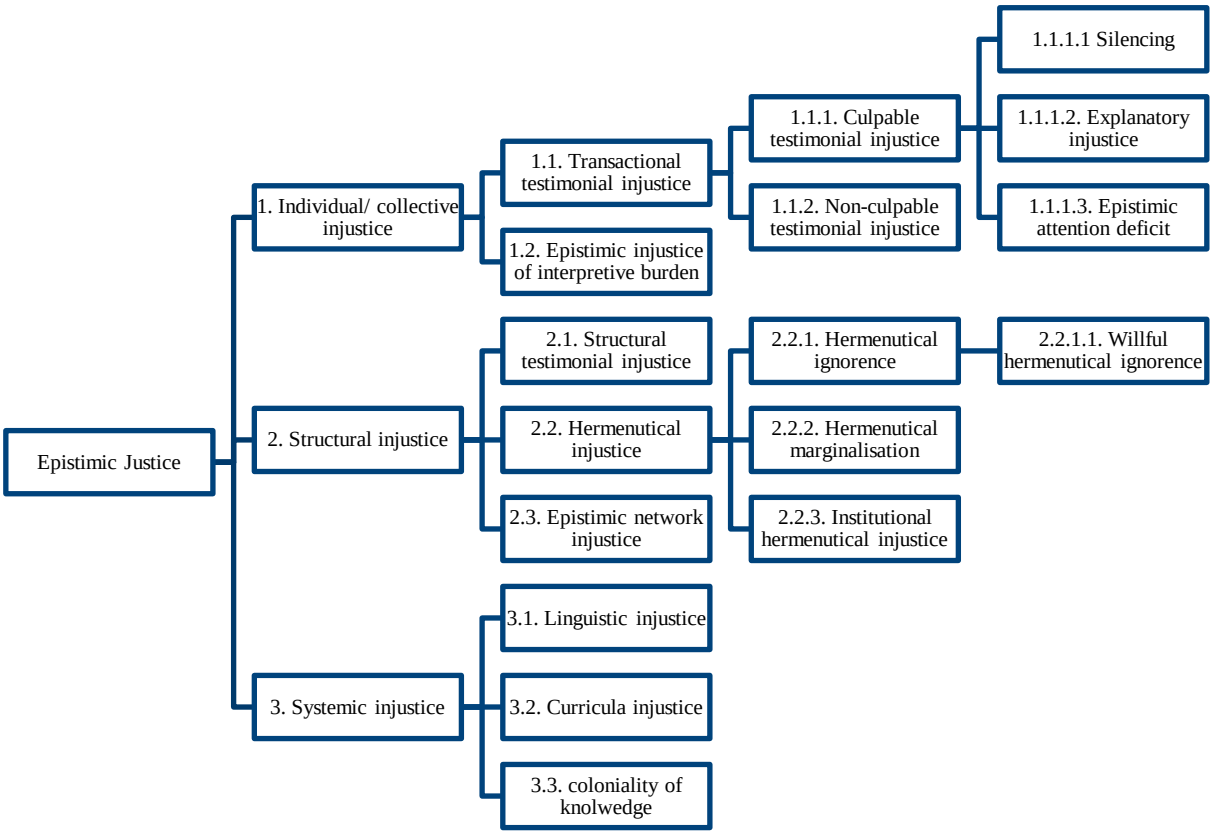

Figure 1 Individual/collective, structural and systemic epistemic injustice (Source: Cummings et. al., 2023)

The following section aims to provide a concise explanation of individual/collective, structural, and systemic injustices with examples where necessary.

1. INDIVIDUAL/ COLLECTIVE INJUSTICE

Individual/ collective injustice included aspects pertaining to transactional testimonial injustice and the epistemic injustice of interpretive burden.

1.1. Transactional testimonial injustice: This form of injustice occurs when epistemic injustice is due to the identity prejudice of an identifiable agent (Anderson 2012).

1.1.1. Culpable testimonial injustice: This form of injustice occurs when "we explain someone's beliefs by appeal to stereotypes associated with her gender, sexuality, race, or class, instead of the reasoning that led her to believe as she does" (Mitova 2020, p. 707, as cited in, Cummings et al., 2023, p. 4)

1.1.1.1. Silencing: It entails that the speaker has little credibility that that she might not have even spoken (Fricker, 2007)

1.1.1.2. Explanatory injustice: This form of injustice occurs when "we explain someone's beliefs by appeal to stereotypes associated with her gender, sexuality, race, or class, instead of the reasoning that led her to believe as she does" (Mitova 2020, p. 707, as cited in, Cummings et al., 2023, p. 4) undermining the individual as a knowledge holder

1.1.1.3. Epistemic attention deficit: This occurs due to a failure to pay attention to an individual as an epistemic agent which limits their ability to influence what others believe and to take part in exchanges of knowledge (Mitova, 2020; Smith, l. & Archer, A., 2020, as cited in, Anderson, 2012).

1.1.2. Non-culpable testimonial injustice: These are instances where individuals exhibit unjust behaviours or attitudes due to a lack of critical awareness or understanding, rather than deliberate malice or culpable negligence (Fricker, 2007).

1.2. Epistemic injustice of interpretive burden: This injustice places an unfair burden of communication between social groups on the marginal group. This process leads to 'deliberate dehumanization and devaluation of marginalized groups and their linguistic practices' (Grabelsky, 2016, p. 2, as cited in, Cummings et. al., 2023) and includes wilful epistemic ignorance on the part of the dominant group. The burden on bridging the interpretive gap is placed on the marginalised. (Grabelsky, 2016, as cited in, Cummings et. al., 2023)

2. STRUCTURAL INJUSTICE

Structural injustice includes structural testimonial injustice, hermeneutical injustice, and epistemic network injustices.

2.1. Structural testimonial injustice: This form of epistemic injustice occurs when "institutions are set up to exclude people without anyone having to decide to do so" (Anderson, 2012, p. 166)

2.2. Hermeneutical injustice

2.2.1. Hermeneutical ignorance:

2.2.1.1. Wilful hermeneutical ignorance: This occurs when dominantly situated knowers refuse to acknowledge epistemic tools developed from the experienced world of those situated marginally i.e., dominantly situated knowers misunderstand, misinterpret, and/ or ignore whole parts of the world (Anderson, 2012)

2.2.2. Hermeneutical marginalisation: This is a form of epistemic injustice where individuals or groups are systematically excluded or marginalized from participating in the processes of interpretation and understanding within a particular social context. This exclusion occurs when dominant interpretive frameworks fail to accommodate or acknowledge the perspectives, experiences, or knowledge of marginalized individuals or groups.

Hermeneutical marginalization can manifest in various ways, such as the dismissal or devaluation of certain narratives, experiences, or ways of knowing, thereby perpetuating inequality and reinforcing existing power dynamics within society. (Fricker, 2007)

2.2.3. Institutional hermeneutical injustice: This occurs when a person, particularly a member of a marginalised group such as an indigenous community, is required to articulate their thoughts "the operative 'language' or conceptual repertoire of this institution" (Townsend and Townsend, 2021, p. 154). As such marginalised persons have been excluded from being active participants in the practices through which the relevant legal concepts and their meanings have been developed, and as a result, asserting themselves and claiming their rights means translating their lived experiences into concepts whose meanings may be ill-fitting for those experiences. (Townsend & Townsend, 2021)

2.3. Epistemic network injustice: rises when groups of individuals are not able to connect with peers, reducing their political influence. (Spiekermann, 2020)

3. SYSTEMATIC INJUSTICE

Systemic injustice includes linguistic injustice, coloniality of the knowledge system, and curricula injustice.

3.1. Linguistic injustice: This form of injustice occurs due to the adoption of English as a lingua franca (Townsend & Townsend, 2021; Catala, 2022) as a result of which many non-English speakers within academia are excluded from the discourse. Additionally, extra-linguistic baggage that English carries an additional burden with non-English speakers or speakers and non-standard English speakers being considered to be less credible. It is also linked to the complete exclusion of non-Anglophone journals and institutions (Catala, 2022, as cited in, Cummings et. al., 2023).

3.2. Curricula injustice: Curricula injustice is defined as "injustice evident in education policies and practices which are used to 'naturalize' discrimination, racism, sexism, colonialism, and patriarchy by marginalizing diverse epistemologies, disciplines, theories, concepts, and experiences" (Paraskeva, 2017; Patin et al., 2021, as cited in, Cummings et al. 2023, p. 6). It can be evident in the failure to publish and cite scholars from the global South and Eastern Europe (Cummings & Hoebink, 2017; Patel et al., 2022, as cited in Cummings et. al, 2023) but also in the failure to integrate non-Western epistemologies in curricula.

3.3. Coloniality of knowledge: Cummings et. al. (2023) use this term to capture the epistemic injustice of colonialism, which is further defined as a "form of cultural injustice that occurs when the concepts and categories by which a people understand themselves and their world is replaced or adversely affected by the concepts and categories of the colonizers (Bhargava, 2013, as cited in, Cummings et al. 2023). They identify various aspects of coloniality of knowledge which includes, the 'inferiorization' of indigenous cultures', marginalization of elements of indigenous epistemic frameworks, and transformation of epistemic forms of indigenous cultures involving, for example, the loss of '...older conceptions of individuation,

multiple belongings and fluid selves' (Bhargava, 2013, p. 415, as cited in, Cummings et. al., 2023). Epistemicide or the destruction of systems of knowledge, is also linked to this concept.

3.3 Justifying the selection and acknowledging limitations

The holistic framework in epistemic injustice developed by Cummings et al. (2023) is constructed by integrating scholarly literature on both epistemic injustice and sustainable development. Their emphasis is primarily on SD aspects. However, my research aims to undertake a broader examination of the intersections between ESD and epistemic injustice. Specifically, this study delves into the identification of epistemic tensions embedded in critiques of ESD, and the ways in such tension may signal the ways in which epistemic injustice may arise within this critical field. This endeavour seeks to bridge educational perspectives with sustainable development concerns. Essentially, my intention is to leverage this framework as a guiding tool for dissecting the complexities of ESD and its relationship to epistemic justice, thereby contributing to a deeper understanding of the educational dimensions of sustainable development.

In this project, the holistic framework in epistemic injustice developed by Cummings et al. (2023) serves as a robust analytical and theoretical lens for several compelling reasons. Firstly, it offers a comprehensive understanding of the multifaceted nature of epistemic injustice, derived from a thorough examination of pertinent literature. This in-depth exploration equips researchers with a nuanced comprehension of the diverse manifestations of epistemic injustices which includes individual/ collective, structural, and systematic injustices. Secondly, the framework provides a structured methodology for the identification and analysis of epistemic injustices within the context of my research. By offering examples of the multifaceted manifestations of epistemic injustices in a structured manner, it enables me to systematically uncover and analyse instances of epistemic injustices, thereby facilitating thorough inquiry and insightful findings. Ultimately, it serves as an invaluable analytical tool that empowers my study to delve deeply into the complexities of epistemic injustice within the realm of ESD.

Acknowledging the limitations of this analytical lens is essential for maintaining transparency and integrity in the research process. Firstly, it is crucial to recognize that the field of epistemic injustice is still relatively nascent, and knowledge in this area is continually evolving. As such, there may be aspects of epistemic injustice that are not fully captured or understood within the scope of this study. This acknowledgment carries particular significance within the context of a study aiming to utilize a framework originally devised for the examination of SD within the realm of ESD. Expanding this framework into the realm of education introduces the possibility that epistemic tensions may not neatly align with the predefined categories outlined in the framework. Additionally, it is crucial to acknowledge that while the framework proposed by Cummings et al. (2023) offers systematic and clear categorizations of epistemic injustices, these classifications may inadvertently impose constraints when applied to real-world contexts: In practice, the complexities of educational settings and the nuanced dynamics of epistemic injustices may defy rigid categorization. Educational environments are inherently diverse, encompassing a multitude of intersecting identities, power structures, and knowledge systems. These complexities are compounded when considering the global scale of the ESD project. As such, attempting to fit the varied manifestations of epistemic injustices into predefined categories may

oversimplify or overlook the intricacies of these phenomena. Moreover, epistemic injustices can often be fluid and context-dependent, evolving over time and shaped by a multitude of intersecting factors (see, Fricker, 2017). Therefore, while the framework provides a valuable starting point for analysis, it is essential to approach its application with a critical lens, recognizing the inherent limitations of categorical frameworks in capturing the complexity and fluidity of epistemic injustices within real world global educational contexts.

Cummings et al. (2023) have constructed this framework as a hierarchy, interconnecting key concepts from the literature in a structured manner to serve as a heuristic device. However, they acknowledge that, in reality, the relationships between these concepts are more network-like and interconnected than their hierarchical representation suggests. This recognition highlights the dynamic and complex nature of epistemic injustice, which often involves intricate interdependencies and feedback loops between various elements. While the hierarchical structure provides a useful organizational framework for analysis, it may oversimplify the dynamic interactions and feedback mechanisms inherent in epistemic injustice phenomena. Therefore, I believe it is important to approach the framework with an awareness of its limitations and to recognize the need for flexibility in its application to accommodate the network-like nature of epistemic injustices. Cummings et al. (2023) also acknowledge that their framework represents the first attempt at delineating such a comprehensive framework. Given this pioneering nature, it is inevitable that the framework will undergo further refinement, additions, and amendments as research progresses. Therefore, while the framework offers valuable insights into the study of epistemic injustice within SD contexts, it is essential to view it as a dynamic and evolving tool that will continue to evolve alongside ongoing research and scholarship.

4 Methodology

What if we posit that, in the present moment, it is the Global South that affords privileged insight into the working of the world at large? (Comaroff & Comaroff, 2012, p. 1)

4.1 Outlining the systematic review process

Grant & Booth's *A Typology of Reviews* (2009) suggests that all varieties of reviews can be classified as systematic reviews if they adhere to a systematic and transparent methodology for identifying, evaluating, and amalgamating available evidence pertaining to a specific research inquiry. This implies that irrespective of the review type (e.g., scoping review, rapid review, critical review), as long as they employ a rigorous and transparent approach, incorporating explicit search criteria, inclusion and exclusion criteria, and a structured and replicable method of data extraction and synthesis, they should be regarded as systematic reviews (PeZicrew, 2001; Zawacki et al., 2016). In my systematic review, my intention is to follow the protocols the methodological guidelines and the best-practices recommended for systematic reviews by Petticrew and Roberts in *Systematic reviews in the social sciences: A practical guide* (2006). The decision to utilize Petticrew and Roberts' guidelines for systematic reviews is well-founded for multiple reasons. Their expertise in the field and the comprehensive nature of their guide make it a trusted resource. Accordingly, by following these guidelines, it is possible to ensure methodological rigor, transparency, and reliability in a systematic review process, particularly in the social sciences domain. Overall, the selection of Petticrew and Roberts' guidelines aligns with the aim of conducting a methodologically sound systematic review within this study.

The approach recommended by them involves a seven-step process which is outlined in Table 1. Initially, the systematic review process necessitates a clear delineation of the review question (Step 1). Subsequently, the types of studies required to answer this question are determined (Step 2), followed by a comprehensive literature search to locate relevant studies (Step 3). Upon locating potential studies, screening is conducted using predefined inclusion criteria to identify those suitable for in-depth review (Step 4). Following this, the included studies are described to map the field and critically appraised for quality and relevance (Step 5). The next step involves synthesizing the findings of the included studies (Step 6), culminating in the communication of review outcomes (Step 7). This structured approach ensures a systematic and methodical examination of the research question, facilitating the production of reliable and robust conclusions.

Table 1 Petticrew and Roberts (2006) systematic review process

Step	Action
Step 1	Clearly define the review question
Step 2	Determine the types of studies needed to answer the review question

Step 3	Carry out a comprehensive literature search to locate the studies
Step 4	Screen the studies found using inclusion criteria to identify studies for in-depth review
Step 5	Describe the included studies to 'map' the field, and critically appraise them for quality and relevance
Step 6	Synthesise studies' findings
Step 7	Communicate outcomes of the review

4.2 Justifying the use of systematic literature review method

To reiterate concisely what was stated in the introductory chapter, the systematic review method is deemed most appropriate for assessing the effectiveness of ESD initiatives due to its ability to challenge established paradigms and provide a comprehensive understanding of available evidence. Petticrew and Roberts (2006) suggest that systematic reviews enable a meticulous analysis of foundational evidence. According to Petticrew and Roberts (2006), "[s]ystematic literature reviews are a method of making sense of large bodies of information, and a means of contributing to the answers to questions about what works and what does not – and many other types of question too" (p. 2). Essentially, systematic reviews serve as a methodological tool for comprehensively synthesizing extensive information, thereby contributing to the elucidation of efficacy and shortcomings in various domains. Beyond merely answering inquiries about effective practices, they provide a mechanism for delineating uncertainties and gaps in existing knowledge, pinpointing areas warranting further investigation. Moreover, systematic reviews highlight instances where unwarranted confidence prevails, illuminating situations where purported understanding surpasses the substantiated evidence, thus emphasizing the necessity for critical evaluation and continued inquiry. It is also an important tool that mitigates biases inherent in traditional literature reviews. Ultimately, systematic reviews enhance the reliability and validity of findings, facilitating evidence-based insights into a field of inquiry.

This study employs systematic review methodology as a sound tool for comprehensively synthesising the extensive literature within the domain of ESD. By systematically gathering critiques and insights pertaining to ESD, this approach facilitates the assessment of both certainties and uncertainties surrounding ESD initiatives. Given the global scope of ESD endeavours, the systematic review emerges as the optimal methodological choice for synthesizing a vast volume of literature. Its structured approach allows for a thorough examination of diverse perspectives and empirical evidence, thereby enabling a nuanced understanding of the complexities inherent in ESD practices and discourse.

4.3 Research questions

Reintroducing here are my research questions to remind the reader that the primary aim of this inquiry is to address the following:

I. What are the key theoretical critiques of Education for Sustainable Development?

II. Are there epistemic tensions embedded in the theoretical critiques of Education for Sustainable Development?
III. If any, to what extent can the epistemic tensions embedded in the theoretical critiques of Education for Sustainable Development, lead to epistemic injustice?
IV. What are the ensuing implications for the pursuit of epistemic justice within and/ or through ESD?

4.4 Database and search strategy

In this section, I am engaged in the third step of Petticrew and Roberts's (2006) systematic review protocol. In devising my search strategy to locate relevant resources, I initially explored various databases to determine their suitability for my topic. Ultimately, I opted to use ERIC (Education Resources Information Center) as my primary database for several reasons. Given the limited timeframe available for conducting research and the limited scope of my master's thesis project, which required a focused and efficient approach, ERIC emerged as the most fitting choice. Additionally, working independently and alone meant that I needed a database that provided comprehensive and accessible resources, allowing me to navigate the research process effectively. Recognized as a reputable and extensively utilized database tailored for educational research, ERIC was deemed to provide a comprehensive array of literature relevant to an inquiry (Hertzberg and Rudner, 1999). Among its myriad resources, the ERIC Database holds paramount significance, encompassing nearly one million citations and abstracts (Hertzberg and Rudner, 1999). Notably, it encapsulates a diverse array of scholarly publications as well as "gray literature" materials, such as conference papers and contractor reports, thereby offering a comprehensive view of educational research and the surrounding discourse. Moreover, its user-friendly interface and search functionalities further facilitated the retrieval of pertinent information within the constraints of my study. Hence, considering these factors, ERIC stood out as the preferred database for my research.

Having settled on ERIC as my database of choice, I employed a generic search string for my research that included the following keywords: “ESD” and “Education for Sustainable Development”, in combination with "theoretical challenges" or "limitations" or “criticisms”. The initial search yielded a total of 842 hits. To ensure the scholarly rigor of the literature, then, inclusion/ exclusion criteria were sequentially applied (see, section 4.5). Initially, the selection was narrowed down to 741 peer-reviewed articles, filtering out non-peer-reviewed sources. Further refinement was made by including only academic journal articles, resulting in a set of 501 relevant articles that underwent detailed scrutiny. The focus was then directed toward articles with full-text availability, enhancing the accessibility and comprehensiveness of the review. The temporal filter, encompassing the years 2013 to 2023 (a ten-year period), was implemented to capture recent developments in the literature, resulting in a final set of 227 articles. Language specifications were subsequently applied, with only English-language articles retained, resulting in a subset of 208 articles. From this, a total of 155 articles were identified as having potential relevance to the research questions after the initial screening phase. Following a more in-depth assessment of abstracts, 71 articles were deemed within the scope of the study, demonstrating a focused selection based on the outlined criteria. Subsequently, a comprehensive evaluation of the full texts was conducted (see, section 4.5), resulting in a further refinement to 42 articles that align closely with the research objectives.

This systematic approach to article selection ensures the inclusion of quality, peer-reviewed academic journal articles that specifically address the challenges and limitations in ESD within the defined timeframe and language parameters. This thorough screening process ensures that the final set of articles selected for inclusion in the systematic literature review is both highly relevant and representative of the discourse on challenges and limitations within ESD. Table 2 summarises the identification, screening, and inclusion process of articles.

Table 2 The systematic review search process

Process	Inclusion	Exclusion
Identification	Records identified from ERIC N = 842	
Screening	Peer-reviewed articles N = 741	Excluded N = 101
	Full-text availability N = 501	Excluded N = 240
	Academic journal articles N = 497	Excluded N = 04
	Temporal filter based on year of publication (years: 2018-2023) N = 227	Excluded N = 270
	Language specification (English only) N = 208	Excluded N = 19
	Assessment of titles N = 155	Excluded N = 53
	Assessment of abstracts N = 71	Excluded N = 84
Inclusion	Assessment of full texts N = 43	Excluded N = 28

4.5 Inclusion and exclusion criteria

This systematic review adheres to specific inclusion and exclusion criteria, focusing on theoretical criticisms, limitations, and challenges within the domain of ESD. By selecting only peer-reviewed academic journal articles published in English between 2003 and 2023, this review ensures a solid and scholarly exploration of the weaknesses inherent in ESD. The deliberate exclusion of materials not directly related to the specified criteria enhances the relevance and reliability of our findings, contributing to a nuanced understanding of the complexities surrounding ESD. Key inclusion and exclusion criteria are captured in Table 3.

Table 3 Inclusion and exclusion criteria

Criteria	Inclusion criteria	Exclusion criteria
Theoretical scrutiny	Articles offering insights into theoretical critiques, limitations, or challenges of ESD	Articles not directly related to theoretical aspects of ESD

Peer-reviewed academic journals	Only articles published in peer-reviewed academic journals	Non-peer-reviewed sources to ensure scholarly rigor
Language criterion	Only articles published in English	Articles in languages other than English
Temporal range	Articles published between 2003 and 2023	Materials falling outside this temporal scope

4.6 PRISMA protocol and quality assessment

Petticrew and Roberts's (2006) contend that, across disciplines, the definition of study quality varies, reflecting diverse perspectives of researchers. They emphasize that within the realm of systematic reviews, the evaluation of study quality predominantly centres on internal validity, assessing the extent of methodological biases. However, they also assert that the concept of quality assessment transcends this limited focus, encompassing broader dimensions such as transparency, accuracy, methodological appropriateness, utility, and propriety, which encompasses legal and ethical considerations. These criteria constitute the framework for quality assessment employed in the present study. For this purpose, PRISMA-S (Preferred Reporting Items for Systematic reviews and Meta-Analyses) was employed. The adoption of the PRISMA protocol in this systematic review is justified for several reasons. Firstly, PRISMA is widely acknowledged as the benchmark for conducting systematic reviews, guaranteeing transparency, replicability, and comprehensiveness in the review process (Moher et al., 2009). Moreover, the PRISMA protocol furnishes a clear framework for the selection, analysis, synthesis, and assessment of bias and limitations in relevant studies (Page et al., 2021). By adhering to the PRISMA protocol, this review aims to uphold the highest standards of rigor, transparency, and replicability in study selection and analysis. This approach ensures that the synthesized evidence offers a comprehensive and dependable overview of the literature pertaining to ESD and its theoretical critiques.

For quality assessment, I have employed the guidelines set out by the Critical Appraisal Skills Program (CASP: 2006; Petticrew & Robberts, 2006). The quality checking process focused on four pivotal sections: General information, content, research design and methodology, and overall conclusions. Quality assessment criteria are captured in Table 4. This comprehensive approach ensured a thorough evaluation of each article's contribution to the understanding of the theoretical critiques, limitations, and challenges of ESD.

Table 4 Quality assessment criteria

Category	Quality assessment criteria
General information	What is the title, authorship, keywords, subject area, journal, and the year of publication.
Research design and methodology	Is the research objective(s) clear? Was the research design appropriate to address the aims of the research? Was the data collected in a way that addressed the research issue?
	Do the researchers state the research methods used? Do the authors justify the use of chosen methods?

Data analysis and results	Was the data analysis sufficiently rigorous? Is there a clear statement of findings? Are the results clearly presented? Do the researchers report on reliability and validity of the research?
Ethics	Have ethical issues been taken into consideration?

4.7 Acknowledging my limitations

Acknowledging the limitations of my research approach is crucial to ensure transparency and integrity in the scholarly inquiry. While my search terms and inclusion/exclusion criteria were meticulously defined to align with the objectives of my study, it is important to recognize that this may have inadvertently excluded valuable insights and perspectives. By focusing solely on theoretical criticism, I may have overlooked studies that explore related concepts or frameworks without explicitly using the terminology outlined in my search strategy. This limitation also highlights the challenge of delineating theory from practice, as certain studies may offer valuable theoretical insights despite not explicitly labelling themselves as "theoretical critiques", or essentially "critiques". It is important to note that, when I refer to theoretical critiques, I am specifically identifying critiques that operate primarily at a theoretical level, focusing on theoretical frameworks, conceptual analyses, or methodological approaches, rather than those that primarily offer practical recommendations or application-oriented findings. This categorization was achieved through a careful examination of the articles. Moving forward, it is essential to remain cognizant of this limitation and consider alternative approaches to capture a broader range of relevant literature.

Furthermore, the decision to limit the search results to English-language publications has introduced a bias into the study, perpetuating a colonial and epistemic injustice dynamics that I am acutely aware of. By excluding non-English literature, I have inadvertently overlooked valuable contributions from diverse cultural perspectives and marginalized voices. Recognizing the importance of inclusivity and representation, I acknowledge that this limitation undermines the comprehensiveness and richness of the research findings. It is imperative to acknowledge the inherent value of literature produced in languages other than English, as it offers unique insights and perspectives that contribute to a more nuanced understanding of the subject matter. Moving forward, addressing this limitation requires a concerted effort to diversify the sources of information and actively seek out literature from a variety of linguistic and cultural backgrounds. This commitment to inclusivity, while I have not been able to commit to in this study, is essential for promoting equity and justice within scholarly discourse.

4.8 Data analysis: thematic categorisation

During the data analysis phase of this systematic literature review, an inductive thematic analysis approach was employed to distil meaningful patterns and insights from the selected articles. According to Braun and Clarke (2006), inductive thematic analysis involves the development of themes directly from the data, allowing for the emergence of new concepts and patterns without the constraints of pre-

existing theories or frameworks. In this study, a process of categorization into themes was initiated to systematically classify the data into overarching themes, each addressing specific dimensions of ESD. This approach enables a comprehensive exploration of the data.

For this purpose, guidelines set by Braun and Clarke (2006) were followed. This process comprised of a five-step approach. Initially (Step 1), each article underwent comprehensive examination to facilitate familiarity with the data. This involved the extraction of relevant passages and excerpts to serve as the foundation for analysis (Step 2). Subsequently, the extracted data segments were analysed and coded based on their thematic relevance and content (Step 3). This coding process was iterative, allowing for the refinement and consolidation of codes as the analysis progressed. Following the initial coding phase, similar codes were aggregated to form preliminary themes, capturing common threads and patterns across the dataset (Step 4). Thereafter, a reviewing process was undertaken to ensure the proper alignment of codes within themes, with adjustments made as necessary (Step 5). Finally, a narrative description was crafted for each theme, providing insights into its significance within the broader study context and addressing the overarching research questions. This systematic approach facilitated the extraction of meaningful insights and patterns from the data, contributing to a comprehensive understanding of the complexities surrounding ESD.

The thematic categories that emerged during the data analysis encompass a spectrum of critical dimensions within the context of ESD, each carrying implications for sustainability (see, Table 5). Firstly, there is a focus on conceptual (dis)unity, revealing tensions inherent in conceptualising objectives, priorities, methods, and evaluation processes, thereby influencing the effectiveness of sustainability initiatives. Secondly, the analysis delves into the tensions between the global and the local, which also encompasses the dynamics between the centre and the periphery, shedding light on how such tensions can impact the implementation and success of sustainability practices. The third theme explores the interplay of ESD with contemporary socio-political paradigms, examining whether it aligns with or challenges prevailing frameworks and ideologies crucial for sustainable development. The fourth category involves the recognition of inherent anthropocentricism within the discourse of sustainable development education, prompting reflection on the broader implications for ecological balance and biodiversity. Finally, the fifth theme scrutinizes the essence of 'E' in ESD, questioning the nature and role of education within the broader framework and its implications. Together, these thematic categories offer a comprehensive lens to understand the multifaceted aspects of ESD.

Table 5 Thematic categories

No	**Theme**
I.	On conceptual (dis)unity
II.	Tensions between the global and the local
III.	With or against socio-political paradigms
IV.	Anthropocentricism
V.	Education

It is imperative to highlight that these thematic categories should not be treated as mutually exclusive. Instead, they represent interconnected strands of critique within ESD (see, Chapter 6). These interrelations are clearly delineated in Chapter 5 and Appendix 2. While recognizing that these themes are not mutually exclusive and often overlap, a decision was made to organize the articles under the

theme that aligns most closely with their content. This decision took into consideration how closely the conclusions within each article align with the chosen theme. This approach prioritizes readability and comprehension for the reader, facilitating a clearer understanding of the main points and arguments presented in each article. Thus, rather than being perceived as a weakness in methodology, this deliberate organizational strategy aims to optimize clarity and coherence in presenting the research findings. To reiterate, the analysis within the study takes into account the interrelations between these themes ensuring that the complexity of the subject matter is duly considered, while also taking efforts to present the results with clarity and coherence.

To summarise, thematic analysis is a powerful method for analysing data that allows researchers to summarize, highlight key features of, and interpret a wide range of data sets (Braun and Clarke 2006). In this study, this analytical method has allowed me to systematically categorise the literature into themes which facilitates a nuanced understanding of the complexities inherent in sustainability education. This thematic categorization facilitated the identification of key trends and commonalities, providing a structured framework for synthesizing the diverse perspectives presented in the literature. This categorisation not only enhances the clarity and interpretability of the findings but also lays the groundwork for constructing a comprehensive narrative that reflects the multifaceted nature of theoretical discussions surrounding ESD.

4.9 Statement of ethics

This qualitative study, utilizing a systematic literature review as its primary methodological framework, is grounded in a commitment to ethical standards. The ethical principles that guide every aspect of this research have been adopted based on the recommendations made by Suri (2015) in *Ethical Considerations of Conducting Systematic Reviews in Educational Research*. Accordingly, the following questions were considered.

I. *"What are key ethical considerations associated with identifying an appropriate purpose for a systematic review"?* (Suri, 2015, p. 44, emphasis in original)

In addressing this query, I am tasked with articulating the purpose and objectives of the study to justify the allocation of resources and effort. Recognizing the potential influence of my personal and professional interests on the research, I have taken steps to ensure ethical conduct. This entails providing explicit justifications for undertaking the research, outlining its relevance, and acknowledging my positionality as a researcher, which may impact the study's outcomes. These considerations are thoroughly explored within the introduction section, enhancing coherence and transparency.

II. *"What are key ethical considerations associated with developing an appropriate strategy for sampling and searching relevant primary research reports to include in a systematic review?"* (Suri, 2015, p. 46, emphasis in original)

To address this inquiry effectively, it is essential to establish a robust methodology within the systematic review process to mitigate any potential methodological bias in research. Consequently, I have crafted a suitable sampling and search strategy, as delineated in this chapter. Adhering to protocols and guidelines advocated by field experts, I have ensured the rigor and transparency of my study.

III. *"What are key ethical considerations associated with evaluating, interpreting and distilling evidence from the selected research reports in a systematic review?"* (Suri, 2015, p. 47, emphasis in original)

Systematic reviewers typically lack direct access to participants from primary research studies included in their review, thus negating the requirement for informed consent from participants. Furthermore, as the study solely relies on publicly available literature, there is no direct engagement with human participants. However, the information analysed is inevitably influenced by the subjective perspectives of the authors of individual studies. Hence, it is imperative for "systematic reviewers to critically reflect upon contextual position of the authors of primary research studies included in the review, their methodological and pedagogical orientations, assumptions they are making, and how they might have influenced the findings of the original studies" (Suri, 2015, p. 48). Ethical considerations mandate systematic reviewers to assess the quality and relevance of evidence presented in primary research reports relative to the review's purpose. In this chapter, I transparently outlined the quality assessment protocols utilized to ensure that literature of highest quality was selected for this study.

IV. *"What are key ethical considerations associated with constructing connected understandings in a systematic review?"* (Suri, 2015, p. 49, emphasis in original)

Suri contends that "[t]hrough informed subjectivity and reflexivity, systematic reviewers must ethically consider how their own contextual positioning is influencing the connected understandings they are constructing from the distilled evidence (2015, p. 49). In this study, I have made a concerted effort to openly acknowledge my own subjective positionality. This means I have been transparent about how my own perspectives, biases, and personal experiences might influence my interpretation of the literature. Additionally, I have taken care to engage with the literature in a sensitive manner, recognizing the diverse viewpoints and contexts represented within it. Throughout the review process, I have upheld a commitment to intellectual honesty and integrity, ensuring that my analysis of existing works is conducted with transparency and rigor. This includes accurately representing the ideas and findings of other authors, while also critically examining them within the broader context of the research topic.

V. *"What are key ethical considerations associated with communicating findings of a systematic review to diverse audiences?"* (Suri, 2015, p. 44, emphasis in original)

In order to address question of communicating findings in an ethical manner, I have utilised PRISMA protocols which are useful guidelines to improve the transparency of the process in systematic reviews. I have described them in length and ensured that my study adheres to highest ethical standards in reporting the finding of the selected literature.

In sum, although there is no direct interaction with human participants, the study has undergone a thorough review and careful consideration to ensure strict adherence to ethical principles and standards. By adhering to these ethical principles, I seek to contribute to a comprehensive understanding of the evolving discourses within the ESD paradigm while upholding the principles of ethics.

4.10 Statement of sustainability

This is a study on sustainability. In this study, I embark on a journey to learn how to do sustainability better and to drive sustainability education towards more equitable outcomes. It is a necessary exercise in the pursuit of a more sustainable as well as a more equitable world. I believe it is an imperative in a world that is unequal in myriad different ways. It is within this context that the study seeks to contribute to the discourse on sustainability, recognizing the intertwined relationship between knowledge power dynamics and sustainability. Within a world where epistemic diversity intertwines with pronounced epistemic inequality, dialogue initiated by this study holds significant importance. It confronts the complexities of epistemic tensions and delves into the dynamic interplay between epistemic dominance and resistance. It is an important, but often overlooked aspect that both education and sustainability paradigms must confront. By acknowledging and addressing the injustices inherent in epistemic inequality, we can foster more inclusive and equitable approaches to both education and sustainability. As such, this study aims to highlight these complexities, encouraging deeper reflection and dialogue to pave the way for more just and sustainable futures.

This study links aspects relating to sustainability, the SDGs, and ESD recognizing the pressing need for concerted efforts to address issues such as climate change, biodiversity loss, poverty, and inequality. Essentially, this study underscores the critical role of sustainability in navigating a world fraught with complex and seemingly insurmountable challenges. Amidst escalating environmental degradation, social injustices, and economic inequalities, the urgency of sustainability efforts becomes increasingly apparent. This study acknowledges the interconnected nature of these challenges and emphasizes the necessity of holistic approaches that transcend disciplinary boundaries and siloed thinking. More importantly, this study recognises that these crises my require more systemic and structural solutions. While individual actions and localized initiatives are important, they may not be sufficient to address the root causes of issues. Therefore, this study emphasizes the need for systemic transformations that challenge existing power structures, sustainability models, and societal norms. In highlighting epistemic struggles, it underscores the importance of understanding and addressing the underlying power dynamics within knowledge systems, which can shape perceptions, priorities, and actions related to sustainability. By advocating for comprehensive changes at both systemic and epistemic levels, this study aims to contribute to the development of more inclusive and equitable approaches to tackling global challenges.

This study also contributes to education within the sustainability paradigm with its exhaustive focus on ESD. While some may perceive an emphasis on critique of ESD as disruptive or negative, I contend that it serves as a catalyst for progress within sustainability endeavours. Critique, when wielded constructively, acts as a powerful tool for identifying areas of weakness, challenging the status quo, and igniting innovation. I believer, it serves as a catalyst for introspection and innovation, prompting a reassessment of existing approaches and systems in the pursuit of more effective and just solutions or ways forward. Essentially, this work can be construed as a constructive dialogue, propelling the field of sustainability forward towards greater resilience and adaptability in the face of complex challenges. In sum, I believe embracing critique within sustainability work is not an exercise in negativity, but rather an acknowledgment of the inherent complexities and contradictions within the pursuit of sustainability.

5 Results

We must develop, "alertness or sensitivity to the possibility that the difficulty one's interlocutor is having as she tries to render something communicatively intelligible is due not to it being nonsense or her being a fool, but rather to some sort of gap in collective hermeneutical understanding. The point is to realize that the speaker is struggling with an objective difficulty and not a subjective failing" (Fricker, 2007, p169)

To enhance readability and clarity, I have chosen to present results in two formats: First, I delineate the key findings within tables structured according to the five respective themes. Subsequently, each table is accompanied by a narrative commentary, which serves to establish a coherent linkage among the highlighted findings. I believe my choice to present five tables within each thematic category rather than presenting one lengthy table encompassing all studies has helped enhancing clarity. However, a comprehensive table, ordered alphabetically by the authors' names, can also be found in the appendix section. The tables present concise introductory descriptions of each article included in this study with the key criticisms highlighted in the article. It is important to note that certain articles and their associated criticisms transcend themes, and I have indicated such instances to prevent redundancy in presentation. I hope this approach in presentation serves to enhance accessibility and comprehension for readers (see, Chapter 4 for further justification). Following the tables, I transition into a narrative section that contextualises the studies within the five key themes. These narrative commentaries lay the groundwork for the subsequent discussion chapter where I will further contextualize these findings vis-a-vie the theoretical framework in epistemic injustice. For the complete bibliographic list of the articles, please refer to the appendices section.

5.1 Theme 1: On conceptual unity: tensions between objectives, priorities, methods, evaluation

Table 6 Results: Theme 1

No	Article	Main critique(s)	Related themes
I.	Balancing the Tensions and Meeting the Conceptual Challenges of Education for Sustainable Development and Climate Change (Blum et al., 2013)	The article illuminates the conceptual challenges in ESD, particularly focusing on the interplay between conceptualization, policy formulation, and practical implementation.	1, 2

II.	Education for sustainable development (ESD): Exploring theoretical and practical challenges (Kopnina and Meijers, 2014)	The article contends that since the aims of ESD are often contested and criticised opening ESD for multiple interpretations, what is being evaluated as successful ESD can also be contested. They argue that, "what needs to be evaluated is not necessarily the [ESD] programs themselves, but programs' underlying ideological assumptions and implicit objectives" (p. 200).	1, 2, 3, 4, 5
III.	Challenging the Concept of Ethical Literacy within Education for Sustainable Development (ESD): Storytelling as a Method within Sustainability Didactics (Franck and Osbeck, 2018)	The article discusses the possibility for ESD to compromise children/ students' individual integrity and freedom of choice given the implicit and explicit assumptions within ESD regarding goal attainment. The study ultimately highlighting the difficulties of imparting a singular agenda when "there is no such thing as unequivocal and unquestionable 'sustainability morals'" (p. 134) and discusses the ways forward	1, 5
IV.	Education for the Future? Critical Evaluation of Education for Sustainable Development Goals (Kopnina, 2020c)	The study is an exploration of the paradoxes of sustainable development such as the sustainability-through-growth-paradigm and offer alternative education that emphasise "planetary ethic" and degrowth.	1, 3, 4
V.	What's in a Name? The Signifiers and Empty Signifiers of Environmental Sustainability Education: Implications for Teacher Education (Karrow at al., 2022)	The authors argue that "the moniker of environmental and sustainability education is an empty signifier in that it fails to convey meaning about what it signifies" (abstract) and examines the limitations and benefits of such empty signification.	1, 5
VI.	Research Approaches in ESD/ESE: Reflections of Swiss Researchers (Pache et al., 2023)	The article explores research paradigms that are more suitable for ESD concerns about its potential instrumentalization for purposes contrary to sustainability objectives. The paper addresses the inherent biases and power asymmetries often present in ESD discourse, advocating for research approaches that mitigate these risks.	1, 5
VII.	Discovering Earth and the Missing Masses-- Technologically Informed Education for a Post-Sustainable Future (Takkinen and Pulkki 2023)	The article critiques ESD for the promotion of the green growth model combined with technological advancement with ESD promoting technology as the remedy for sustainability crises. In doing so, the authors explore epistemic and emancipatory challenges of technology.	1, 3, 4

Critics frequently contend that the lack of conceptual unity with regards to ESD has notable implications for policy and practice, as highlighted, for instance, by Blum et al.(2013), Hasslöf, H et al. (2014),

Ferguson (2023), Kopnina & Meijers (2014), and with Schilar deeming ESD “an empty signifier” that fails to convey what it signifies (Karrow et al. 2022). ESD is also described as 'elastic' by Swedish researcher Knutsson and echoed by other scholars (Kunutsson, 2014; Rist, 2008, as cited in, Franck and Osbeck 2018). Critics contend that the lack of conceptual unity results in tensions among educational approaches: For instance, should it emphasize content delivery or prioritize building the capacity "to think critically about what experts say and to test sustainable development ideas" (Vare and Scott, 2007, as cited in, Blum et al., 2013, p. 208). Additionally, a crucial question arises regarding whether educational programs should focus on instructing individuals in predefined 'correct' behaviours or, alternatively, cultivate the ability to navigate rapid change and uncertainty, placing emphasis on critical thinking and a comprehension of global interconnections (Pigozzi, 2007; Bangay and Blum, 2010, as cited in, Blum et al., 2013, p. 208). Additionally, a strong link is established between ESD and technological advancement that is promoted as an educational means to remedying the sustainability crises. However, Takkinen & Pulkki questions “technology’s ability to guarantee sustainability through the current expansive and extractivist uses of natural resources” (p. 1156).

Despite the widespread acceptance of SD's theoretical goal to harmonize economic, social, and environmental aspects, there persist tensions regarding prioritization. Critics argue that a paradox emerges with the simultaneous pursuit of continuous economic growth, leading to heightened consumption of natural resources, while attempting to miraculously sustain these resources for future generations (Kopnina 2020c, p. 281). This critique prompts questioning about the feasibility of achieving economic and social priorities without compromising environmental considerations. Researchers also ask, for instance, which research approaches or paradigms are particularly suitable for the ESD objects (see, for example, Pache et al., 2023), what the preferred methodology for/ of ESD should be (Kopnina & Meijers, 2014), and how success can be evaluated (see, for example, Kopnina and Meijers, 2014, p. 189, for a discussion on ESD evaluation). Essentially, the apparent absence of conceptual coherence on what it is, how it can be achieved, what success looks like, holds consequences for policy and practice, a consideration that must be taken into account.

5.2 Theme 2: Tensions between the universal/ global vs the local

Table 7 Results: Theme 2

No	Article	Main critique(s)	Related themes
I.	Re-Examining the Importance of Indigenous Perspectives in the Western Environmental Education for Sustainability: "From Tribal to Mainstream Education" (Chandra, 2014)	The article examines the discourse on SD from both Western and Indigenous viewpoints. The study underscores the imperative of incorporating traditional ecological knowledge into sustainability education, advocating for pedagogical approaches such as "environmental education for sustainability”	2, 4, 5
II.	Hegemony and the Politics of Policy Making for Education for Sustainable Development: A Case	The article examines the relationship between global policy, structural power, and hegemony by delving into cultural contextualisation of ESD. The author challenges the notion of ESD as a	2, 5

	Study of Vietnam (Bengtsson, 2016)	hegemonic global policy and reframes it as contested terrain, particularly evident in its recontextualization within the local culture of Vietnam.	
III.	Reviewing Strategies in/for ESD Policy Engagement: Agency Reclaimed (Lotz-Sisitka, 2016)	This is a response to Bengtsson (2016). The author argues that critique of ESD should go beyond the critique of trickle-down effects of UN policy to encompass critiques of "deep seated contradictions" (p. 101) in ESD research and praxis that is inclusive of critiques of environmental degradation, increasing poverty-wealth gap and continued colonisation of societies.	2, 5
IV.	Sustaining the Life-Chance Divide? Education for Sustainable Development and the Global Biopolitical Regime (Hellberg and Knutsson, 2018)	The authors highlight that ESD, although presented as a "cosmopolitan ethical enterprise", is in fact an enterprise that perpetuates global inequalities.	2, 3, 5
V.	Sustainable Development for Whom? A View from Oceania (Thaman, 2019)	The article problematises the global and local (i.e., the Pacific) perceptions of ESD within a context where "education and development have been totally dominated by foreign cultures, their languages, knowledge systems, communication networks, and research paradigms, for over a century now" (p. 4).	1, 2, 5
VI.	Managing the GAP between Rich and Poor? Biopolitics and (Ab)Normalized Inequality in South African Education for Sustainable Development (Knutsson, 2020)	The author states that ESD advances a regime of practice wherein inequality has become normalised. This study emphasises the generic problems of implanting a global policy such as ESD in an unequal world.	1, 2, 3, 5
VII.	Segmented Prizing: Biopolitical Differentiation in Education for Sustainable Development (Knutsson, 2021)	The study delves into the normalization of global inequality through an examination of prizes awarded to ESD projects.	1, 2, 3, 5
VIII.	'We Must Urgently Learn to Live Differently': The Biopolitics of "ESD for 2030" (Bylund, Hellberg, and Knutsson, 2022)	The study focuses on aspects of biopolitical differentiation in global ESD policy and highlights the dubious nature of the "inclusion" of rich and poor populations, and the problematic manners in which socio-economic contextual	2, 3, 5

		difference is “recognized” within this global policy	

A recurring criticism revolves around the inherent tensions between the professed universality (i.e., applicability to all in all contexts) of ESD and the concurrent exclusion of certain groups, coupled with the devaluation of local knowledges. For example, Chandra (2014) claims that the Western-centric ideology of SD is guided by modernization theory, rooted in neoclassical economic principles of rationality, individualism, materialism, and social hierarchy (Daly & Cobb, 1989, as cited in, Chandra, 2014, p. 118), characteristics that are perceived as causes of unsustainability. This underscores the call to reclaim local knowledge within the sustainability paradigm. With regards to adopting ESD in non-western contexts, where legacies of colonial pasts persist, it is imperative to approach educational strategies sensitively, acknowledging historical power dynamics and promoting culturally relevant approaches to sustainability. This is highlighted by Thaman (2019) who underscores the challenges of implementing a global policy within non-western contexts, where education and notions of development are often dominated by Western ideals, languages, knowledge systems, and research paradigms.

Additionally, the current conceptualization of ESD and SDGs also raises concerns about the "dubious inclusion [of people in peripheral spaces]" and the problematic recognition of contextual differences (Bylund et al., 2022, p. 41). Employing a Foucauldian biopolitical analysis, the authors argue that ESD departs from the notion of humanity as a collective entity, instead categorizing human populations differently (p. 45). This approach, they contend, poses problems as it risks reinforcing inequalities and unsustainability rather than fostering conditions for sustainability. This view is also highlighted in Knutsson’s previous work (Knutsson, 2020 and 2021; Hellberg & Knutsson, 2018) that asserts that ESD advances a regime of practice that normalises global inequality.

Moreover, ESD is criticized for its top-down approach (Hasslöf et al., 2014), especially in value-driven inquiries within education, where ESD is viewed as susceptible to accusations of indoctrination (Jickling, 2003; Jickling & Wals, 2008; Scott & Gough, 2003, as cited in, Hasslöf et al., 2014) and cognitive imperialism (Kopnina 2020c). Conversely, Bengtsson (2016) challenges the hegemonic potential of a global policy initiative such as ESD by examining the way in which ESD has been recontextualised to Vietnamese culture highlighting the agency of local settings. However, Lotz-Sisitka (2016), in response to Bengtsson (2016), claims that the critique of hegemony of ESD should go beyond the mere top-down approach of UN policy to encompass other forms of hegemony such as the contradictions or paradoxes in ESD, some of which were highlighted in Theme 1.

5.3 Theme 3: Working with or against contemporary socio-political paradigms

Table 8 Results: Theme 3

No	Article	Main critique(s)	Related themes
I.	Neoliberalism, New Public Management and the Sustainable Development Agenda of Higher	The article elucidates the interplay between neoliberalism, new public management (NPM), and the SD agenda within higher education. The authors explore how control mechanisms rooted	3, 5

	Education: History, Contradictions and Synergies (Bessant et al., 2015)	in neoliberal and managerialist principles, such as quality control and institutional performance metrics, govern various aspects of academic and student behaviour at institutional, departmental, and individual levels. They highlight the dual role of these mechanisms in both propelling and constraining the sustainability education agenda.	
II.	The UN Decade of Education for Sustainable Development: Business as Usual in the End (Huckle and Wals, 2015)	The article asserts that in failing to acknowledge and challenge neoliberalism, ESD fails in its potential for fostering real sustainability	3, 5
III.	Teaching Sustainability in Norway, China and Ghana: Challenges to the UN Programme (Witoszek, 2018)	The authors contend that major hurdles to ESD include the paradox of continuing "the growth fetish" while meeting ecological aspirations; lack of a synergic approach to teaching sustainability with a holistic awareness of global problems and corresponding teacher education; and the promotion of competition as opposed to corporation is sustainability efforts. The author asks, "[d]oes the rift between educational aspirations and a stubborn anti-ecological modernity mean that modern education systems are rendered powerless, unable to forge attractive future trajectories of fair and sustainable societies?" (p. 841).	1, 2, 3, 4, 5
IV.	Education for Sustainability in the Parks: A Project Inspired by Chet Bowers (Morris, 2019)	The study critiques ESD as fundamentally flawed arguing that ESD's foundational premise of development as an educational objective is inherently flawed. This critique highlights limitations of ESD such as "alignment with economic wealth, bias toward "higher" knowledge both in discipline and context, and its lack of diverse perspectives in the discourse" (p. 55). Additionally, the paper emphasises the lack of acknowledgment of higher education institutions' culpability in perpetuating the current state of unsustainability.	1, 3, 4
V.	More of the Same: A Critical Analysis of the Formations of Teacher Students through Education for Sustainable Development (Sjögren, 2019)	This article explores the subjectivities that are formed through sustainability education highlighting the tendency to reproduce "sameness" thereby reproducing dominant paradigms.	1, 3, 5

VI.	Ecopedagogy: Teaching Critical Literacies of 'Development', 'Sustainability', and 'Sustainable Development' (Misiaszek, 2020)	This study discusses the need for critical reinvention of ESD models through an ecopedagogical reading of ‘development’.	1, 3, 4, 5
VII.	Education to Transform the World: Limits and Possibilities in and against the SDGs and ESD (Griffiths, 2021)	The author explores the tension between economic growth and capital accumulation objectives and environmental sustainability goals. It highlights that ESD proposals often reflect orthodoxy of education as human capital formation for economic development, albeit within a reformed “green growth” model.	1, 3, 4, 5
VIII.	Caribbean Dreams: Education for More than "Just" Sustainable Development (Brissett, 2022)	The study posits that education's efficacy in tackling pivotal social and environmental challenges hinges on a profound critique of prevailing positionalities and the vested interests of the global elite. The author underscores that ESD inadvertently reinforces global inequalities by advocating for an educational paradigm that perpetuates a specific form of modernist capitalist development, thus perpetuating systems of exploitation.	3, 5
IX.	An Ecopedagogical, Ecolinguistical Reading of the Sustainable Development Goals (SDGs): What We Have Learned from Paulo Freire (Misiaszek, 2022)	The study employs a Frieirean reading to reveal the underlying politics of ‘development’ and hidden curricula embedded within environmental pedagogies such as ESD. The paper highlights that SDGs often exhibit technocratic, hierarchical, soloed, and limited characteristics, which, instead challenging oppressive structures, normalizes existing social systems, including hegemony.	1, 3, 4, 5
X.	Empowering Political Engagement with Unsustainable Actions: The Possibilities and Limitations of Teaching Guides for Climate Change Education (Olsson, 2022a)	This article critiques capacity building teacher guides aimed at increasing teachers’ capacity to promote sustainable actions through ESD. The study recognises an important blind spot and argues that there is an “absence of education to cultivate knowledge that empowers students’ abilities to analyze, problematize and confront the systemic causes of unsustainable actions” (p. 1120) given that the emphasis is on “the symptoms (unsustainable choices of behaviour) rather than the systemic causes (unsustainable modes of organization)” (p. 1120).	1, 3, 4, 5

XI.	Representations of Humans, Climate Change, and Environmental Degradation in School Textbooks in Ghana and Malawi (Ress et al. 2022)	The authors illustrate the limitations of ESD in its ability to challenge political, economic, social, and ecological inequities. It highlights that ESD "risk[s] uncritically reproducing colonizing and racializing logics, systems, and practices" (p. 614).	2, 3, 4, 5
XII.	The Holocene Simulacrum (Wallin 2022)	The study criticises ESD for its "fidelity to a mode of political economy and model of human-nature relations complicit with planetary ecocide" (abstract).	1, 3, 4, 5
XIII.	Sustainable Learning and Some Counterculture Values in Jamaica: A Rastafarian Spiritual Ethos to ESD (De Angelis 2023)	The study highlights the need to investigate broader systemic issues of power, exploitation, and socio-environmental injustice perpetuated by global ESD policy and delves into the potential contribution of faith-based systems in fostering transformative learning.	1, 2, 3, 4, 5

Huckle & Wals (2015) claim that ESD "amounted to 'business as usual in the end' as far as challenging neoliberalism" (Huckle and Wals 2015, p. 502), and that there is a "fidelity to a mode of political economy and model of human-nature relations complicit with planetary ecocide" (Wallin, 2022, abstract). Critics establish a link between neoliberalism, the dominant political-economic paradigm of the time (McChesney 1998, p. 7, as cited in, Bessant et al., 2015), and the SD agenda (see, also, Kopnina 2020c). They question the feasibility of achieving transformative change without a fundamental departure from the neoliberal paradigm, given its identification as a primary contributor to unsustainability (Jucker, 2004, 38, 41, as cited in Bessant et al., 2015, p. 422) and also given that learners are affected by a neoliberal mindset (Witoszek, 2018). A postcolonial analytical perspective also suggests that contemporary capitalist development ideas and practices have roots in a history of imperialism, and exploitation, stemming from unequal global relations of political and economic power rooted in colonialism (Tangi, 2005, as cited in, Brissett, 2022). Consequently, the present form of capitalist development idealised in SD is viewed as oppressive and nearly unattainable for the Global South (Brissett, 2022).

Moreover, within neoliberalism, education is often reduced to either a public good or an economic tool (Bessant et al., 2015). Griffiths (2021) argues that ESD proposals mirror the conventional view of education as human capital formation for economic development, limiting its transformative potential. Consequently, in ESD, education is positioned to perpetuate a system that contribute to the unsustainable exploitation of the Earth for economic gain. "Why educate for such a thing?", asks Jickling (Jickling, 1992, p. 3, as cited in, Brissett, 2022). This view is also highlighted by Olsson (2022a) who claims that currently, the way ESD is imagined and prescribed, it is unable to challenge unsustainability given that the focus is on "the symptoms (unsustainable choices of behavior) rather than the systemic causes (unsustainable modes of organization)" (Olsson 2022a, p. 1120). Sjögren (2019), through an exploration of the subjectivities that ESD produces, claims that ESD tends to reproduce "sameness" there by reproducing dominant paradigms that exacerbate unsustainability.

Essentially, critics inquire whether genuine transformative change is achievable without radical political shifts and challenges to current socio-political systems of power that perpetuate unsustainability. It

questions the effectiveness of ESD as a policy if it fails to instigate a change in the political paradigm. As De Angelis (2023) also argue, there is a need to investigate broader systemic issues of power, exploitation, and injustices perpetuated by the global ESD policy, especially in relation to non-western local settings. Misiaszek (2020 and 2022) also highlights that the notions of 'development', 'sustainability', and 'sustainable development', require a critical re-reading (2020) and that there is a need to challenge the hegemonic aspects of SDGs and ESD that normalise oppressive social structures of power (2022). This view is also furthered by Morris (2019) who claims that ESD is fundamentally flawed in its promotion of 'development' as an ideal which supports the "alignment with economic wealth, bias toward "higher" knowledge both in discipline and context, and its lack of diverse perspectives in the discourse" (Morris, 2019, p. 55). Ress et. al. (2022) furthers this view with their claim that ESD "risks uncritically reproducing colonizing and racializing logics, systems, and practices" (p. 614).

5.4 Theme 4: Inherent anthropocentricism

Table 9 Results: Theme 4

No	Article	Main critique(s)	Related themes
I.	Neoliberalism and justice in education for sustainable development: A call for inclusive pluralism (Kopnina and Cherniak 2016)	The authors argue that the dominant form of pluralism employed within education, such as the notions of equity and democratic learning, is essentially anthropocentric, prioritizing social justice over interests of more-than-humans and emphasises the need for a more "inclusive pluralism".	3, 4, 5
II.	Education for Sustainable Development Goals (ESDGs): What Is Wrong with ESDGs, and What Can We Do Better? (Kopnina 2020b)	The study offers a critique of both SDGs and ESD highlighting their predominant emphasis on economic and social aspects of sustainability at the expense of environmental considerations which results in the non-recognise of ecological justice or biospheric egalitarianism. Essentially, the author argues for the limitations inherent in anthropocentric approaches to justice and sustainability.	4, 5

It should be noted that the articles that discuss inherent anthropocentricism in ESD is also linked to other themes, especially theme one and three, and thus, the shorter table. Existing research on ESD policy has consistently identified an anthropocentric bias in ESD (see, for example, Kopnina 2012, 2014, 2016, 2020c, 2020b; Kopnina and Cherniak 2016; Olsson 2022b) with a clear emphasis on sustaining human life as the primary objective of ESD for 2030. Kopnina contends, in multiple articles, that anthropocentricism aligns closely with neoliberalism (Kopnina, 2012a, 2012b, 2013a, 2013b, 2013c, 2014a; Kopnina & Meijers, 2014; Kopnina & Shoreman-Ouimet, 2015, as cited in, Kopnina, 2016, p. 140), and thus, she, highlights the imperative to explore alternative discourses such as philosophical

ecocentrism and ecological justice involving all species (Kopnina 2016). This can also be linked to the paradox of sustaining a growth paradigm while safeguarding ecological justice discussed in Theme 1 and 3 (Kopnina, 2020b). Kopnina (2020a) also emphasises the way in which, social and economic justice concerns trump ecological justice concerns in an attempt to illustrate the limitations of anthropocentric approaches to justice and sustainability. Additionally, Kopnina & Cherniak (2016) finds that dominant forms of pluralism that are upheld in ESD such as the notion of democracy, only pertains to human justice concerns. Without challenging inherent anthropocentricism in ESD, is it possible to address the environment related sustainability challenges, is a question that is often asked.

5.5 Theme 5: Nature and role of education in ESD

Table 10 Results: Theme 5

No	Article	Main critique(s)	Related themes
I.	Critical Reflections on the UNDESD: From the Perspectives of Informal Education in a Community Development Context (Noguchi, 2017)	This study critiques ESD as it primarily focuses on formal education overlooking informal education particularly considering the perspectives of marginalised people.	1, 5
II.	Seeking Sustainability Competence and Capability in the ESD and HESD Literature: An International Philosophical Hermeneutic Analysis (Shephard, Rieckmann, and Barth, 2019)	This study discusses the way in which "miscommunication" or "misunderstanding" of basic yet widely-used concepts in ESD lexicon such as "competence" and "capability" is hindering the progress of ESD.	1, 5
III.	Education for sustainable development in Africa: a critique of regional agendas" (Tikly, 2019)	This study argues that while education is seen as transformative, "the historical role of education in supporting unsustainable development" (abstract) is often insufficiently critiqued.	3, 4, 5
IV.	Education and Learning in Sustainable Development: Foregrounding an Emergent Discourse (Manteaw, 2020)	This study, through critical discourse studies, discusses the seemingly instrumentalization of education within the ESD discourse.	1, 5
V.	Bureaucratic Exercise? Education for Sustainable Development in Taiwan through the Stories of Policy Implementers (Huang, Harvey, and Asghar, 2021)	The authors critically assess the prevalent notion of education as a singular solution to sustainability challenges. The study argues that unless education actively confronts unsustainability by engaging learners in confronting the inherent dilemmas and contradictions within sustainability challenges, it cannot be deemed an effective solution.	3, 5

VI.	Intersections and Collaborative Potentials between Global Citizenship Education and Education for Sustainable Development (Khoo and Jørgensen, 2021)	This study argues for the case of integrating ESD and global citizenship education and emphasises the need for transgressing "the individualism and separateness implied by the autonomous space of liberal education and to begin to engage with different, action-oriented and collective subjectivities" (p. 472). They contend that the contemporary crises of global society call for "alternative, cooperative, solidaristic, relational and affective modes of knowing, doing and being" (p. 478).	3, 4, 5
VII.	Student-Centered Learning and Sustainability: Solution or Problem? (Komatsu, Rappleye, and Silova, 2021)	This study challenges the contention that ESD and student-centered learning are axiomatic. The study claims that student-centered learning deters educational contributions to sustainability by extending a culturally specific belief in ontological individualism by promoting student-centerd learning.	1, 5
VIII.	Recontextualising Education for Sustainable Development in Pedagogic Practice in Vietnam: Linking Bernsteinian and Constructivist Perspectives (Nguyen, Leder, and Schruefer, 2021)	This study examines the way in which ESD is recontextualised in a non-westerns pedagogic setting where the global ambitions of ESD principals and prescribed pedagogic principles and practices become challenged by local cultural values.	1, 2, 5
IX.	From "education for sustainable development" to "education for the end of the world as we know it" (Stein et al., 2022)	This study argue that the contemporary crises are "not primarily rooted in ignorance and thus solvable with more knowledge, nor primarily rooted in immorality and thus solvable with more normative values" (abstract); rather, the authors argue that they are rooted in "modernity-colonial modes of existence" which are "underwritten by racial, colonial, and ecological violence" (p. 275)	3, 5
X.	Facilitating Democratic Processes for Sustainability: The Possibilities and Limitations of Teaching Guides for Climate Change Education (Olsson, 2022b)	This study focuses on the challenges of pluralistic ESD such as the challenge to fosters actions for sustainability without prescribing predetermined actions; the tension between the 'universal' ethical ideals and values of ESD and the pluralistic approaches' emphasis to foster autonomous and free citizens; and the challenge of hegemonies such as anthropocentricism, modernisation, and neoliberalism inherent in ESD.	1, 5

XI.	Perceived interest in learning sustainability competencies among higher education students (Hyytinen et al. 2023)	This study finds, among other things, that students' interest in learning sustainability competences and their worldview on sustainability varies across different academic disciplines. Consequently, the variance across disciplines emerges as a crucial factor to consider in ESD, highlighting the diversity inherent in the educational landscape.	1, 5
XII.	Classical paradigms versus complexity thinking in engineering education: an essential discussion in the education for sustainable development (Sigahi et al. 2023)	This study finds that the prevailing paradigm trains professionals "to think from a Cartesian, reductionist perspective" (abstract) and argues that tackling contemporary unsustainability challenges requires equipping students with the ability to integrate complexity thinking into their approach.	1, 5

ESD is often considered a complex and tension-ridden pedagogical landscape (Witoszek, 2018, p. 840). For instance, Shepherd et.al. (2019) highlight the way in which the lack of consensus on ESD lexicon can hinder the progress of ESD by creating "misunderstandings" or "miscommunications". Beyond the conventional focus on knowledge and skills in education, an increasing body of literature emphasizes the necessity to realign education to encompass "values, attitudes, motivation, worldviews, and behavior" (Hay et al., 2019, as cited in, Hyytinen et al., 2023). This recognition is considered crucial for students to comprehend both the complexity and the ethical dimensions of various sustainability issues involved (Melles, 2019, as cited in, Hyytinen et al. 2023). However, there is also the recognition of the instrumentalization of education in the current ESD discourse in the way in which it frames the role of education in today's global society (Manteaw, 2020). This view is also highlighted by Olsson (2022b) who questions the possibility to foster sustainability action without reducing education to a form of prescription of predetermined action. There is, also, discussions on the need for collaboration or convergence between citizenship education (see, for example, Khoo and Jørgensen, 2021), ecopedagogy (see, for example, Warlenius, 2022), etc. if ESD is to succeed. Critics also highlight that ESD, primarily focused on formal education, tends to overlook the significant role of informal education in addressing real-life sustainability challenges (Noguchi, 2017).

Moreover, there are also educational paradigms to consider: for instance, Sighai, et. al. (2023) critiques the classical paradigms that education currently operates in which can lead learners to think in reductionist ways when education should encourage complexity thinking given the complexities of contemporary sustainability challenges. ESD also calls for "a holistic action-oriented and transformative pedagogy" (Leder 2018; Rieckmann 2018; UNESCO 2017b, as cited in, Nguyen et al., 2021, p. 314), emphasizing the importance of *how* learners should engage in the learning. However, discrepancies arise as these ideals are found to be at odds with the actual pedagogical practices employed by teachers, for instance, influenced by cultural factors (Nguyen et al., 2021). This highlights a gap between the recommended methodology and the practical implementation that requires careful consideration.

Critics also underscore the historical contribution of education to unsustainable development, asserting that for education to truly enact transformative change, there is a pressing need to fundamentally realign education policy to prioritize social and environmental justice (Tikly, 2019). Another criticism aimed at

ESD relates to ESD's promotion of student-centered learning which is seen as axiomatic of ESD's transformative potential. However, (Komatsu et al. 2021) challenges this view with their claim that student-centerd learning extends a culturally specific (i.e., western) belief in ontological individualism. They contend that there is a need to explore other ontological paradigms in order to empower learners.

Critics argue that education's limitations prevent it from fostering sustainability, as it fails to challenge the socio-political paradigms sustaining the issues at hand: Stein et al. (2022) argue that the current unsustainable predicament is not primarily a result of "ignorance", resolvable with increased knowledge, nor is it rooted in "immorality", addressable with more normative ethical values. Instead, it originates from, what they term, "modernity-coloniality" (Stein et al., 2022). According to the authors, ESD falls short in addressing this fundamental challenge. This view is also furthered by Huang et al. (2021) who questions whether education can be the "solution" unless education is able to engage learners to critique the contradictions inherent in sustainability paradigms. Witoszek (2018) also questions, "[d]oes the rift between educational aspirations and a stubborn anti-ecological modernity mean that modern education systems are rendered powerless, unable to forge attractive future trajectories of fair and sustainable societies?" (p. 841). What this criticism emphasises is the diverse views on the role and practice of education in the context of ESD.

5.6 Summary and linking to Chapter 6

In this chapter, I have summarised the key criticisms levied against ESD as documented in the literature. It is important to acknowledge that, while my intention to succinctly articulate the findings may have enhanced readability, it could also have led to potential oversimplification of complex findings that require comprehensive examination. While acknowledging that the literature presented in this chapter merit a more detailed and nuanced exploration, I maintain that this concise presentation provides a solid foundation for further in-depth discussion. Moreover, the condensation of information into five thematic categories has facilitated the categorization of diverse criticisms, providing a structured framework for analysis. Additionally, it is necessary to emphasise that these themes are interconnected and that they cannot be treated as mutually exclusive categories. In fact, there are numerous interconnections between the themes and the criticisms within them. However, for the purpose of this study, this categorization serves as a practical organizational tool, enabling a clear and systematic discussion in the next chapter. While recognizing the complexity and interconnectedness of the issues, this approach ensures that the discussion remains focused and accessible to the reader, while still allowing for deeper exploration where necessary.

6 Discussion

> "The construction of knowledge has been a space for power struggles: knowledge has been controlled and manipulated by elites and has served to create a social imaginary of what knowledge is. The body of knowledge: male. The colour of knowledge: white. The territories of knowledge: western Europe. The place of knowledge: the academy. Everything and everyone that is outside of these whimsied parameters has historically fought to be recognized as knowledge and as knowing subjects." (Berenstain et al., 2022, p. 298).

This is the penultimate chapter where the main discussion takes place, and thus, this chapter represents a critical juncture in this study. Building upon the foundation laid in the previous chapter, where the first research question was tackled by establishing key theoretical critiques of ESD, this chapter aims to delve deeper into the broader scope of inquiry. In this chapter, the focus shifts towards addressing the remaining research questions, namely questions two, three, and four. To provide a concise recap, the remaining research questions are as follows: The second question aims to uncover whether there are epistemic tensions embedded within the theoretical critiques of ESD. Following this, the third question seeks to discuss to what extent these epistemic tensions might result in epistemic injustice. Lastly, the fourth question endeavours to discern the resulting implications for the advancement of epistemic justice within and/or through the framework of ESD. The theoretical framework developed in Chapter Three, supplanted by the studies referenced in Chapter Two, serves as the conceptual scaffold upon which the ensuing discussion is constructed.

In the first section of this chapter, I will attempt to read the critiques of ESD using the theoretical framework, and identify, where possible, specific aspects of epistemic tensions or disagreements as embedded in the critiques of ESD. By doing so, I aim to illuminate specific instances where elements of epistemic injustice may be discerned within these criticisms thereby answering second and third research questions. In the subsequent section of this chapter, I intend to explore the ramifications of the identified epistemic injustices, if any, for sustainability education, thereby addressing the final research question. By extrapolating from the insights gleaned in the discussion, I aim to elucidate how these findings inform and shape the landscape of sustainability education.

In undertaking this critical exercise, it is important to remind the reader of my reinterpretation of critique as an epistemic struggle. This position diverts from a conventional view of critique as mere dissent or opposition. Instead, it reframes critique as a lens through which epistemic tensions and disagreements are revealed and examined. By adopting this approach, my aim is to highlight the ways in which the nature of the critical academic discourse surrounding ESD may engender and/ or perpetuate epistemic injustice. This reframing emphasizes the importance of engaging with critique not just at a superficial level, but as a deeper exploration of the underlying power dynamics inherent in academic discourses.

6.1 Identifying epistemic tensions in ESD critique

In this section, the focus is on re-reading the key theoretical criticisms of ESD vis-a-vie the thematic categorisation that was done in the previous chapter. The objective here is to systematically examine each thematic category and map any underlying epistemic tensions or disagreements that may be inherent within them. By systematically examining these critiques and mapping out the epistemic complexities within each category, this section attempts to provide an understanding of the epistemological challenges surrounding ESD. It is essential to underscore that this analysis constitutes a theoretical exercise aimed at illuminating the interplay between ESD's limitations and the perpetuation of epistemic injustice. By dissecting these criticisms and mapping out their epistemic complexities, the goal is to shed light on how critiques of ESD policy have the potential to reinforce existing structures of epistemic inequality leading to epistemic injustice. This theoretical analysis serves as a critical step towards fostering awareness and understanding of the broader socio-epistemic implications of educational policies and practices, ultimately advocating for more inclusive and equitable approaches in education.

6.1.1 Theme 1: On conceptual unity: tensions about objectives, priorities, methods, evaluation

The studies included in this thematic category (Blum et al., 2013; Franck and Osbeck, 2018; Karrow et al., 2022; Kopnina, 2020c; Kopnina and Meijers, 2014; Pache et al., 2023; Takkinen and Pulkki, 2023) underscores the aspects of conceptual unity, or rather its absence, within ESD. The perceived lack of conceptual coherence appears to engender tensions with regards to the delineation of ESD's objectives, priorities, methodologies, and evaluative criteria. Such tensions underscore the challenges in navigating the complex landscape of sustainability education, where divergent perspectives, approaches, and agendas converge. This in turn leads to the question if this lack of conceptual unity within ESD can translate into epistemic tensions.

One of the ways in which epistemic tensions may arise is when various epistemic communities or individuals, operating within "epistemological silos," (Miller et. al., 2008) maintain divergent perspectives based on epistemic convictions. These differences can lead to conflicts regarding the validity, legitimacy, and authority of knowledge claims, as individuals attempt to "work from their own epistemological perspective and seek to acquire and validate knowledge within that epistemology" (Miller et al., 2008, p. 46). Accordingly, within the context of ESD, the absence of conceptual coherence may lead to competing interpretations of sustainability, goals, and strategies, resulting in epistemic contestations among scholars, practitioners, policymakers, and other stakeholders based on epistemic contestations.

It is important to consider if the divergence in interpretations of ESD among scholars, particularly regarding objectives, priorities, methods, and evaluations, can potentially result in epistemic injustices. It is evident that the lack of conceptual clarity or consensus compel practitioners to make choices. When practitioners interpret ESD operating within distinct epistemological silos, there is a potential for marginalizing alternative viewpoints and voices in their decision-making processes. This can result in

epistemic exclusion (see, for example, Settles et al., 2021), wherein certain knowledge systems or perspectives are disregarded or devalued, especially those situated in the margins. The lens of "epistemic labour and knowledge production" (see, Chapter Two, Pohlhaus, Jr., 2017), too is an important lens through which this can be considered. This lens highlights how individuals on the margins bear the disproportionate weight of cognitive labour. What these various arguments ultimately emphasize is that when you inhabit a position on the margins, your experience is often characterized by added burdens and responsibilities.

It can be contended that scholars always and already make choices in their practice. However, it is essential to consider whether such choices, which are an inherent aspect of academic practice, essentially constitute injustice. It could be argued that, if academics actively disregard or silence dissenting voices, it can lead to epistemic injustices such as "hermeneutical marginalisation" and "epistemic network injustice" (see, Chapter Three for definitions). For example, "hermeneutical marginalization" may occur when prevailing interpretive frameworks neglect to recognize the perspectives, experiences, or knowledge held by individuals or groups on the margins. This can manifest as a deliberate dismissal of the marginalized individuals' ways of knowing and their knowledge. Such an act can perpetuate inequality and reinforce existing power dynamics by privileging dominant paradigms within the epistemological landscape. This is compounded by the fact that scholars who hold dominant or privileged perspectives may wield disproportionate influence over decision-making processes within a global setting where there are clear inequalities in academic and epistemic power (Mabon et al., 2022). Moreover, "epistemic network injustice" highlights the challenging task of bridging the gap between privileged and non-privileged academics and their respective positions. This concept emphasises the formidable hurdles faced by individuals or communities outside privileged circles when attempting to access and navigate academic networks. The argument expounded upon in Chapter 2, supported by the contributions of various scholars (refer to Collins, 2017; Grasswick, 2017; Pitts, 2017; Pohlhaus, Jr., 2017; Tsosie, 2017), emphasizes the reality of the academic landscape, where a multitude of inequalities and barriers persist. Essentially, this highlights that epistemic exclusions happen in multiple ways and may not always be solely attributable to individual intentions or overt actions.

However, it is important to ask if exclusion always need to be *intentional* to be considered unjust or for it to perpetuate epistemic injustice. I raise this question in light of the argument that scholars tend to naturally align with or gravitate towards approaches reflective of their experiences, perspectives, or affiliations with particular schools of thought. This alignment may not inherently indicate intentional injustice in their decision-making processes even though this alignment may inadvertently result in the marginalization of alternative viewpoints. While this "unintentional act" may not be characterized by deliberate malice or discrimination, it is crucial to recognize the potential harm epistemic exclusion can inflict. For example, consider aspects related to "non-culpable testimonial injustice," as outlined by Fricker (2007), which can occur due to a lack of critical awareness rather than deliberate intent. This facet of epistemic injustice highlights instances where individuals unintentionally discount or discredit the testimony of others due to implicit biases or entrenched academic norms, rather than any overt hostility or animosity towards marginally situated knowers. Despite lacking malicious intent, these actions can have profound consequences by perpetuating systemic inequalities and marginalizing less-privileged voices within knowledge production and dissemination processes. Thus, while the absence of deliberate malice may absolve individuals of culpability, it does not diminish the need to acknowledge and address the harmful effects of epistemic exclusion resulting from unintentional acts of injustice.

Additionally, consider aspects of "institutional hermeneutical marginalisation" and "linguistic injustice" where marginally situated persons are coerced to articulate their knowledge via "the operative 'language' or conceptual repertoire of this institution" (Townsend and Townsend, 2021, p. 154). This requirement entails that knowledge expressed in, for instance, English, the lingua-franca of today's academia (Adriansen et al., 2023; Alhasnawi, 2021; Bennett, 2013; Catala, 2022; Cussel et al., 2023; Ives, 2010; Jakubiak, 2020; Rostan, 2015, 2017), or knowledge articulated via established academic writing and publishing norms would be considered (Canagarajah 1993, 1996, 2006a, 2006b; Kandiah 2005; Parakrama 2012). These exclusionary practices may arise not from explicit individual intentions to discriminate or exclude, but rather from the inherent structures and norms of academic institutions. For instance, the requirement to articulate knowledge in English or adhere to dominant academic writing conventions may be deeply ingrained within institutional practices and expectations, without deliberate malice towards marginalized individuals or groups. In many cases, these requirements are established as standard procedures or conventions aimed at maintaining clarity, consistency, and accessibility within academic discourse. Moreover, academics and institutions may not always be aware of the exclusionary implications of these practices. Therefore, while the consequence may indeed be the marginalization of individuals or groups who deviate from these norms, the intent behind such practices may not necessarily be deliberate exclusion or discrimination, thereby giving rise to instances of "non-culpable testimonial injustice."

However, despite the absence of overt intentionality, it is crucial to recognize the impact of these exclusionary practices and work towards mitigating their effects. To deem that such practises are apolitical and non-culpable is naïve, particularly when considering the broader socio-political context within which they are situated. While individuals may not consciously intend to perpetuate epistemic injustices, their actions are often influenced by systemic biases, power dynamics, and institutional structures that inherently disadvantage and discriminate against marginally situated groups which are tied to "hermeneutical marginalisation", "institutional hermeneutical injustice", "epistemic network injustice", "curricula injustice" and "coloniality of knowledge". In fact, it could be argued that the conventions, practices and paradigms that are privileged within academia today are deeply entrenched manifestations of epistemic privilege. These dominant frameworks dictate whose knowledge is valued, whose perspectives are centered, and whose voices are heard. Therefore, it is essential to adopt a critical perspective and interrogate the underlying mechanisms that contribute to epistemic inequalities. By recognizing the political dimensions of knowledge production and dissemination, we can begin to challenge the structures of privilege and oppression that perpetuate epistemic injustices within academic and societal contexts.

In sum, the argument I am advancing is that, given the disunity with regards to ESD's aims, objectives, and methodologies, practitioners often navigate a landscape characterized by ambiguity and subjectivity. Accordingly, individuals may naturally gravitate towards privileging the epistemic silos they belong to thereby perpetuating exclusions. In this context, those aligned with privileged epistemologies may wield disproportionate influence and authority, perpetuating existing power structures and reinforcing epistemic privilege placing the interpretive burden on those occupying the margins. This is also compounded by our intersectional identities (see, Collins, 2017) within the global landscape. This dynamic may further marginalize voices, perspectives, and experiences of less privileged knowers, exacerbating inequalities within the discourse. Thus, the lack of consensus may not only perpetuate prevailing power dynamics but may also exacerbate epistemic injustices by hindering marginalized individuals and communities from asserting their epistemic agency. The lack of conceptual clarity and

unity within ESD may engender a situation where diverse perspectives and forms of knowledge expression may be marginalized or disregarded in favour of those aligned with dominant paradigms: To reiterate, the requirement to articulate knowledge within the confines of established academic conventions, such as writing in English or adhering to disciplinary norms, inherently privileges certain voices while silencing others. Consequently, individuals or groups who do not conform to these norms may find themselves excluded from participating in knowledge production and dissemination processes (refer to Collins, 2017; Grasswick, 2017; Pitts, 2017; Pohlhaus, Jr., 2017; Tsosie, 2017).

Moreover, the lack of conventional unity in ESD exacerbates the difficulties in defining and assessing success or progress within the field (Kopnina and Meijers 2014). Without clear and agreed-upon objectives and evaluation criteria, practitioners may inadvertently perpetuate epistemic injustices by prioritizing certain forms of knowledge or approaches over others, without the consideration of alternative viewpoints. Overall, the lack of conceptual unity in ESD creates fertile ground for epistemic injustice by exacerbating the marginalization of diverse perspectives and forms of knowledge expression. Addressing this issue requires not only fostering awareness of the inherent biases and limitations of conventional academic norms but also advocating for more inclusive and equitable approaches to knowledge production and dissemination within the field of sustainability education.

It should also be noted that, while the lack of clarity and consensus in ESD may pose challenges, it simultaneously offers opportunities for innovation, adaptation, and empowerment. In contexts where objectives, priorities, methods, and evaluation criteria are not rigidly prescribed, there exists a space for exploration, experimentation, and creativity. This open-endedness may also allow practitioners to explore diverse perspectives, alternative knowledges, and innovative approaches that may better resonate with diverse learners and communities. Furthermore, the absence of consensus may foster an environment conducive to critical reflection, dialogue, and collaborative learning, where practitioners can engage in meaningful exchanges of ideas and co-create knowledge. By harnessing the potential inherent in this lack of clarity and consensus, ESD practitioners can cultivate more inclusive, equitable, and contextually relevant sustainability education initiatives that address the complex and multifaceted challenges of contemporary world.

6.1.2 Theme 2: Tensions between the universal/ global vs the local

This theme underscores the complex interaction between global aspirations and local realities, revealing the challenges of reconciling professed universal principles within diverse local contexts, particularly within a global landscape where there are significant social, economic, and epistemic inequalities. Criticisms of ESD within this theme not only raise concerns about the marginalization of local voices and the silencing and erasure of indigenous knowledge systems, but also calls attention to the pervasive influence of historical injustices such as the legacy of European colonisation on marginalised settings (Chandra, 2014) and the perpetuation of cognitive imperialism (Kopnina 2020b) inherent in global frameworks such as ESD. The epistemic implications embedded within these criticisms are manifold. The perspectives shared in Chapter Two, encompassing insights from Alcoff (2017), Pantazatas (2017), and Pitts (2017) concerning this theme, hold significance in this context.

The criticism with regards to the marginalization of local voices and the silencing and erasure of indigenous knowledge systems can be linked to “structural testimonial injustice” where institutions are

set up to are set up to exclude people. The nature of a global framework is such that it often operates within established power structures that prioritize certain (often dominant and privileged) voices and perspectives while marginalizing others (Balanzó-Guzmán and Ramos-Mejía, 2023). This structural imbalance may perpetuate systemic injustices, making it challenging for locally situated scholars and communities, especially indigenous peoples, to assert their knowledge and participate meaningfully in decision-making processes (Balanzó-Guzmán and Ramos-Mejía, 2023). Within this context, the voices of marginalized groups are often dismissed or overlooked, reinforcing historical patterns of discrimination and inequality. Moreover, it may also corelate with injustices stemming from "hermeneutical marginalisation", a form of exclusion that occurs when dominant interpretive frameworks fail to accommodate or acknowledge the perspectives, experiences, or knowledge of marginalized individuals or groups. Within the context of ESD, hermeneutical marginalization may exacerbate existing inequalities by perpetuating a narrative that privileges certain (dominant and hegemonic) ways of understanding the world while disregarding others. In essence, while structural testimonial injustice focuses on the systemic suppression of voices due to institutional biases, hermeneutical marginalization highlights how interpretive frameworks can perpetuate exclusionary practices in the way dominant interpretations or frameworks may overlook or diminish the significance of diverse viewpoints, thereby reinforcing existing power dynamics. Both of these forms of exclusion can readily occur within a global context, where tensions between global aspirations and local realities persist.

A significant critique of ESD as a global policy is its failure to address the historical injustices of European colonization and acknowledge their ongoing impact in shaping present-day local realities (see, Chapter Five). It is important to consider the implications of this finding for "testimonial injustice", a form of injustice that occurs due to identity prejudice. Identity prejudice can be directly linked to European colonization through the historical construction of racial hierarchies and the imposition of colonial ideologies that devalue and marginalize indigenous cultures and identities (see, Alcoff, 2017; Collins, 2017; Pitts, 2017; Tsosie, 2017). European colonial powers often employed ideologies of racial superiority to justify their conquests and subjugation of indigenous peoples (Pihama, 2019; Pitts, 2017). This systematic dehumanization and denigration of indigenous identities perpetuated identity prejudice, wherein non-western peoples were viewed as inferior and their voices and experiences were disregarded. Furthermore, European colonization frequently involved the imposition of cultural assimilation policies aimed at erasing indigenous identities and forcibly imposing western norms and values (Arowolo, 2024; Berenstain et al., 2022). The cultural erasure and suppression of non-western knowledge systems contributed to the marginalization and devaluation of indigenous identities within colonial societies. In sum, European colonization played a central role in the construction and legitimisation of identity prejudice by systematically devaluing and marginalizing non-western identities and cultures, perpetuating a legacy of inequality and injustice that continues to impact our present-day realities that ESD initiatives aim to combat. However, in failing to confront the legacy of identity prejudice stemming from historical colonization, ESD risks perpetuating these very injustices (Chandra, 2014), there by pepetuating both social and epistemic injustice.

Tied to identity prejudice stemming from historical colonization is the privileged position western languages such as English occupy within today's academic landscape which I discussed under the first theme, too. Today, English has emerged as the dominant language of scholarship and communication in many academic fields, particularly within the realms of science, technology, and global policy discourse which play a central role in sustainability initiatives such as ESD. While English's widespread

use as a lingua franca facilitates global communication and collaboration, it also perpetuates "linguistic injustices" and reinforces existing linguistic power dynamics inherited from colonial histories (Bennett, 2013; Catala, 2022; Gobbo and Russo, 2020; Jakubiak, 2020; Parakrama, 2012). The dominance of English in academia can exacerbate epistemic injustices by marginalizing knowledge produced in languages other than English. This linguistic hegemony may privilege scholars from English-speaking countries or those proficient in standard English, while disadvantaging scholars from non-English-speaking backgrounds leading to "epistemic injustice of interpretive burden" where the burden of bridging the interpretive gap is placed on the part of marginal groups via the adoption of privileged languages such as English. Failure to do so on the part of marginal groups may result in valuable insights and perspectives from diverse linguistic contexts being overlooked or undervalued, contributing to a narrowing of academic discourse and reinforcing Western-centric knowledge paradigms. Furthermore, the imposition of English as the primary medium of academic communication can perpetuate colonial legacies of cultural assimilation and erasure leading to "curricula injustice". Indigenous languages and knowledge systems, for example, may be further marginalized within academic spaces, exacerbating the marginalization already experienced by non-western communities due to historical colonization.

It is also important to consider the criticism of cognitive imperialism directed at ESD due to its imposition of western-centric knowledge paradigms, values, and educational approaches at the expense of alternative knowledge systems and epistemologies. Cognitive imperialism refers to the dominance of Western epistemologies, ideologies, and educational models, which often marginalize or devalue alternative ways of knowing and understanding the world (Kopnina, 2020b). In the context of ESD, cognitive imperialism can manifest when (Western-centric or dominant) perspectives on sustainability and development are prioritized, while indigenous or local knowledge systems are overlooked or undervalued. One of the main concerns with regards to cognitive imperialism in ESD is its potential to perpetuate cultural hegemony and erode indigenous identities and worldviews thereby perpetuating "coloniality of knowledge", or epistemic injustice of colonialism. By promoting standardized, universalized approaches to sustainability education, ESD may inadvertently undermine the richness and diversity of local knowledge systems, further marginalizing already vulnerable knowledge communities. Moreover, cognitive imperialism in ESD can reinforce existing power asymmetries by privileging and reifying the privilege of particular dominant knowledges. This can result in a form of neo-colonialism, where marginalized knowledges and perspectives are further marginalized and subjugated, perpetuating dependency and unequal power relations.

6.1.3 Theme 3: Working with or against contemporary socio-political paradigms

This thematic category examines the ways in which ESD intersects with the contemporary socio-political paradigms such as neoliberal capitalism and considers whether ESD initiatives inadvertently reinforce neoliberal ideals or whether they challenge and subvert them. This issue is of critical importance for sustainability education, as critics argue that the neoliberal capitalist paradigm is a significant driver of unsustainability. They contend that the pursuit of capitalist development goals can undermine sustainability efforts, even critiquing the emphasis on economic development within sustainability frameworks (Bessant et al., 2015; Griffiths, 2021; Huckle and Wals, 2015; Morris, 2019; Sjögren, 2019; Witoszek, 2018). Additionally, critics highlight the historical context of capitalist

development, pointing out its ties to imperialism and exploitation, which stem from unequal global power relations rooted in colonialism (Brissett, 2022; Chandra, 2014). Let us consider the epistemic implications embedded in this critique.

What these criticisms primarily highlight is the hegemonic nature of the socio-political paradigm of our contemporary era (Lotz-Sisitka, 2016). It could be argued that hegemony suggests a pervasive dominance or entrenched status, leaving little room for alternative paradigms to thrive or compete. Within this thematic category hegemony signifies not only the prevalence, but also the normalization and institutionalization of certain dominant knowledge systems and narratives, often aligned with neoliberal capitalism (Bessant et al., 2015; Griffiths, 2021; Huckle and Wals, 2015; Morris, 2019; Sjögren, 2019). As a result, alternative perspectives that challenge or offer alternatives to this dominant paradigm may be marginalized or excluded from mainstream discourse within ESD. This exclusion can perpetuate epistemic injustices by denying validity and recognition to diverse and alternative knowledge systems and perspectives, ultimately reinforcing the hegemony of the dominant socio-political paradigm. Once more, the burden of interpretation falls heavily on those marginalized by alternative viewpoints, further compounded by institutional injustices. Thus, the hegemonic nature of the contemporary socio-political paradigm exacerbates epistemic injustices by limiting the plurality of voices and perspectives that contribute to shaping sustainability discourse.

It is also essential to consider the critique of economic development as an ideal that SD and ESD advance. This critique also intersects with Theme 1, where concerns were raised with regards to the feasibility of pursuing social and economic goals without compromising environmental priorities within SD (Griffiths, 2021; Kopnina, 2020b; Morris, 2019; Stein et al., 2022). This specific critique can be considered in multiple ways. For instance, it is important to refer to the established link between economic development ideals and those of neoliberal capitalism (Griffiths, 2021; Kopnina, 2020b; Morris, 2019; Stein et al., 2022). In doing so, we can explore how the pursuit of economic growth aligns with the principles of neoliberal capitalism raising questions about whether the economic development goals advocated within SD and ESD inadvertently reinforce neoliberal capitalist ideologies, potentially overshadowing environmental and social concerns in the pursuit of profit-driven growth. According to these scholars, the promotion of economic growth as a primary objective of sustainability can serve to reinforce the hegemony of neoliberal capitalism by legitimizing its values and priorities. In considering this critique through the conceptual lens of epistemic injustice, it could be argued that the hegemonic dominance of economic growth ideals marginalizes perspectives that advocate for alternative sustainability models fostering a space that could readily lead to epistemic injustice

It needs to emphasised that, what I am attempting to convey here is not a call for the complete abandonment of economic ideals, but rather, it is an effort to assess the ways in which their promotion may perpetuate unjust hegemonic structures. This can engender epistemic injustice in multiple ways. The dominance of certain economic narratives within SD and ESD can marginalize alternative perspectives, leading to "hermeneutical marginalization". This phenomenon occurs when dominant frameworks prioritize and validate particular knowledge systems while disregarding or marginalizing others (Fricker, 2007). Furthermore, it can also be explored through the lens of third-order degree of change, as articulated by Pohlhaus, Jr. (2017) that I elaborated in Chapter Two. The entrenched presence of economic growth ideals within our contemporary sustainability discourse might indicate a systematic inadequacy, i.e., a scenario where the system itself is inherently inadequate to entertain alternative perspectives. This could be construed as a form of exclusion perpetuated by the systems themselves, leading to a state of "wilful hermeneutical ignorance". In other words, it could lead to a situation where

the system actively chooses not to engage with or acknowledge alternative interpretations or perspectives, thereby reinforcing its hegemony. In essence, when neoliberal capitalism is the system within which we operate, i.e., “the defining political-economic paradigm of our time” (McChesney 1998, p. 7, as cited in, Bessant et al., 2015), advocating for alternatives outside of this paradigm becomes extremely challenging and requires added cognitive labour. Within the realm of sustainability education, it can silence voices that challenge the dominance of economic growth ideals or propose alternative models of development and sustainability.

An additional concern pertains to the separation of the three pillars (i.e., social, economic, and environmental) in SD and ESD, and how this separation constitutes an epistemic disagreement. When examining the competing priorities within ESD, where practitioners debate whether to prioritize social, economic, or environmental aspects, it becomes evident that this is not merely a practical or logistical discussion but also an epistemic debate. This issue is underscored by Hopwood et al. (2015) as they elucidate, "[t]hese trade-offs indicate a continued conceptual divide between the environment and humanity" (Hopwood et al., 2005, p. 48). In other words, the debate on how to conceptualize and address sustainable development reflects a deeper philosophical divide regarding the relationship between environmental concerns and human activities. This divide has significant epistemic implications, as it shapes not only our understanding of sustainability but also the approaches taken to achieve it. If SD and ESD persist in segregating social, economic, and environmental ideals and promoting them separately, they will perpetuate the dominance of a singular epistemic paradigm, again, leading to "hermeneutical marginalization" and even “coloniality of knowledge”.

There is also the link between neoliberal capitalist ideals and colonialism to consider. The link between neoliberal capitalist ideals and colonialism are axiomatic with scholars contending that colonialism and the globally expansive relations established through colonialism were a necessary condition of capitalist-modernity (Bhambra, 2021; Brissett, 2022; Chandra, 2014). Essentially, such a view highlights the need to recognize the significance of historical colonial relations to both the establishment and continued reproduction of global political economy. It also emphasises the fact that contemporary social and economic inequalities are a condition of colonialism (Engerman and Sokolo, 2006). Consequently, if ESD neglects to address the historical root causes of present-day crises, it may risk overlooking critical aspects of sustainability and injustices (Bhambra, 2021; Brissett, 2022; Chandra, 2014). Returning to the focal point of discussion, what I am seeking to emphasize is the impact of hegemonic modern socio-political systems and the unjust conditions that facilitated their advancement, along with the implications they hold for epistemology. Contemporary hegemonic systems, deeply rooted in historically unjust exploitations, wield substantial influence over contemporary power dynamics, socio-political structures, and economic conditions. Consequently, recognizing the role of these systems and the injustices inherent in them is crucial for understanding the complexities of tackling injustices at a global scale vie policies such as ESD.

Ultimately, the central issue revolves around whether ESD should continue to align itself with or actively challenge dominant socio-political paradigms, each choice carrying significant epistemic implications. Choosing to work within existing paradigms may risk perpetuating the hegemony of dominant socio-political ideologies, potentially marginalizing alternative perspectives and perpetuating epistemic injustices. Conversely, challenging dominant paradigms may offer the opportunity to disrupt hegemonic narratives, amplify diverse voices, and promote more equitable and inclusive approaches to sustainability education. It may be an imperative to open up the space for the recognition and validation of diverse knowledge systems and perspectives, offering opportunities to foster more inclusive and

equitable approaches to sustainability education. Accordingly, this decision holds profound epistemic consequences, as it shapes not only the content and objectives of ESD initiatives but also the broader discourse surrounding sustainability, development, and justice. Thus, careful consideration of the epistemic implications of aligning with or challenging dominant socio-political paradigms is essential.

Nevertheless, I would also like to consider some questions posed by Bessant et al. (2015) who contend that while there are many calls to shift away from dominant neoliberal paradigms within education, there are also "myriad sustainability and ESD success stories to date" (p. 472). They ask whether it is possible to contend that nothing meaningful can be achieved within the dominant paradigms in light of these stories: "[…] are we not contradicting ourselves if we say that nothing meaningful can be achieved within our existing system? […] Are we being overly ideological and not practical and rational enough about the nature of change? Or by working within the neoliberal system, are we unwittingly continuing to support it?" (p. 472). Indeed, success stories abound and will continue to be told. Amidst contemporary crises, there is a need for such narratives of triumph (see, also, Witoszek, 2018). However, it is also imperative to contemplate the epistemic implications of these narratives, ensuring they are not wielded to justify or legitimise status quos that perpetuate injustices. Instead, it is important to consider ways to use them to critically reflect on and potentially redress social and epistemic injustices.

6.1.4 Theme 4: Inherent anthropocentricism

Within the discourse of ESD, a profound epistemological tension often arises concerning the anthropocentric nature of its objectives. This particular theme is strongly tied to theme 1, 2, and 3, and thus, there are numerous intersections. What the critics argue is that, the core aim of ESD is to ensure the sustainable survival and well-being of human societies which inherently places humans at the centre of the sustainability narrative (see, for eample, Kopnina 2012, 2014, 2016, 2020c, 2020b; Kopnina and Cherniak 2016; Olsson 2022b). This anthropocentric stance raises critical questions about prioritizing human interests over the broader ecosystem. Epistemologically, this tension reflects differing perspectives on the nature of knowledge and values. It prompts inquiries into how knowledge is constructed, whose perspectives are privileged, and what ethical frameworks underpin sustainability efforts. The clash between anthropocentric and ecocentric views as advanced by Kopnina (2016, 2020a), for instance, highlights deeper philosophical debates about humanity's relationship with the natural world and the moral responsibilities associated with environmental stewardship. Addressing these epistemological tensions necessitates not only a re-evaluation of educational practices but also a broader societal re-examination of our (ethical) obligations to both humans and the planet as a whole. Accordingly, it can be argued that this epistemological tensions in ESD extend to the very conceptualisations of sustainability itself, raising questions about "sustainability for whom?".

Let me remind you of the arguments made in Theme 2 concerning the inherent tensions in the three pillars of SD and ESD, particularly with regards to the debates surrounding the segregation of social, economic, and environmental dimensions. I argued that this discussion extends beyond practical considerations and enters the realm of epistemology, illustrating deeper philosophical and ethical schisms. It entails that practitioners are confronted with questions concerning the fundamental values and knowledge paradigms that underpin sustainability efforts. Consequently, the prioritization of one pillar over the others reflects not only differing practical approaches but also fundamental epistemic

perspectives, highlighting the complexity of reconciling diverse worldviews within the discourse of sustainability education (Hopwood et al., 2005). It is essential to recognise that advocating for a trade-off between these pillars is anthropocentric; Similarly, completely separating the pillars is also inherently anthropocentric: both approaches prioritize human interests over the interconnectedness of environmental, social, and economic aspects of sustainability. Considering the epistemic implications of such an anthropocentric stance is important.

Essentially, what the critics unveils is the hegemonic position that anthropocentric perspectives hold within the discourse of sustainability and contemporary socio-political paradigms that ultimately condition our ways of knowing and being. This bias underscores the dominance of human-centered values and priorities, often at the expense of broader ecological considerations and the well-being of more-than-humans (Kopnina 2014, 2020a). Consequently, it could be argued that the prevalence of anthropocentric viewpoints mirrors broader power structures that marginalize alternative epistemologies, notably those grounded in less anthropocentric paradigms: Specifically, the hegemonic position of highly anthropocentric Western development and sustainability paradigms negatively impact indigenous worldviews, which historically embraced less anthropocentric and more eco-centric philosophies (Kopnina 2012, 2014, 2020a). It could be argued that this underscores hermeneutical marginalisation, curricular injustice, and aspects relating to coloniality of knowledge that have created a space where alternative and more holistic ways of understanding the world are systematically suppressed and overlooked. This marginalization can perpetuate a cycle of epistemic injustice, wherein non-dominant knowledge systems, are side-lined in favour of Western-centric paradigms that are anthropocentric in nature. Consequently, diverse perspectives and ways of knowing are excluded from mainstream discourse, reinforcing existing spiciest hierarchies and inhibiting the emergence of more inclusive and equitable educational as well as sustainability frameworks. Addressing these aspects of epistemic injustices may require recognizing the pivotal role of epistemology in shaping not only what knowledge is valued but also whose perspectives are centered within sustainability education and broader societal discourse.

This also emphasises the intersections between anthropocentrism, hegemonic Western epistemologies, and socio-political paradigms, thus guiding our focus back to Themes 3. For instance, the exploitation of natural resources for economic profit originates from anthropocentric hierarchies within Western knowledge systems, which prioritize human economic interests over those of the environment (Kopnina 2014, 2020a). Moreover, scholars contend that contemporary neoliberal capitalist socio-political paradigms have exacerbated these hierarchical structures by prioritizing market-driven approaches that commodify nature and perpetuate unsustainable consumption patterns, thereby deepening the entrenched anthropocentric worldviews (Kopnina 2016). This entanglement is further linked to colonial expansions, where the subjugation and exploitation of natural resources were foundational to the establishment of colonial power structures, reinforcing anthropocentric ideologies (Biswas, 2022; Erickson, 2020). This predicament underscores that colonial legacies, alongside neoliberal capitalist ideologies, wield considerable influence in shaping contemporary policies, institutions, and social norms on a global scale. Together, these forces perpetuate systems of inequality, shaping the trajectory of global development and posing significant challenges to achieving inter-species justice. Reclaiming a space where these entanglements can be critically examined and challenged requires confronting epistemological injustices inherent in our modern anthropocentric ways of knowing and ontological practices that condition our modern anthropocentric ways of being.

It is possible to consider this thematic category in relation to "wilful hermeneutical marginalisation", a form of injustice that is perpetuated by our systems themselves. Pohlhaus, Jr. (2017) contends, citing Dotson (2014a) that, "think what a given epistemic system does not allow one to think, revealing the system itself to be not just insufficient (and so remediable by adding and adjusting) but rather inadequate to certain epistemic tasks (and so in need of a new epistemic system)" (p. 20). Anthropocentrism can also be examined within the context of this line of inquiry: Our contemporary systems offer limited space for exploring post-anthropocentric or less-anthropocentric possibilities of knowing, an aspect that must be taken into account in our knowledge practices. Additionally, it could be argued that being human entails an inherently anthropocentric perspective, making it seemingly impossible to evade anthropocentricism. Thus, it is important to consider ways to acknowledge and navigate our intrinsic anthropocentrism without allowing it to unduly dominate our comprehension of sustainability. I believe, the way forward lies in finding ways to minimise excessive manifestations of anthropocentricism by centering alternative epistemologies that provide us the space and the knowledge necessary to do so. It entails that we recognise that there are knowers such as people of indigenous heritage who may know better than others to minimise excessive manifestations of anthropocentricism. The challenge lies in ensuring that these knowers' knowledge is acknowledged and is integrated within the broader discourse on sustainability.

6.1.5 Theme 5: Nature and role of education in ESD

Education and epistemology share a symbiotic relationship, deeply entwined in their exploration of knowledge, each influencing and enriching the other (see, Chapter Two). As highlighted in Chapter Two, contemporary epistemological discourse encompasses a range of philosophical inquiries concerning fundamental concepts such as epistemic value, understanding, knowledge-how, testimony, and intellectual virtue. Notably, a significant convergence exists between the epistemological challenges surrounding these notions and the corresponding challenges evident within educational theory (Carter and Kotzee, Forthcoming). Accordingly, the role of education in advancing SD through ESD entails a multitude of epistemological considerations. In this section, I will focus on a few select critiques and discuss their potential to lead to epistemic injustice.

A key criticism of ESD pertains to its perceived inadequacy in addressing values, ethics, and attitudes, which are frequently marginalized within conventional educational paradigms prioritizing information dissemination (Hyytinen et al., 2023). Intriguingly, there are also critiques that challenge the presumed ability to achieve sustainability through both ethical/values-based education and knowledge/information-centric approaches. From this vantage point, the prevailing condition of unsustainability cannot be ascribed to deficiencies in knowledge or moral rectitude that could be redressed through either an ethics/values-oriented educational framework or one centered on knowledge/information dissemination (Stein et al. 2022). Instead, they challenge both viewpoints and aim to tackle what they perceive as a deeper root cause of unsustainability: a form of modern coloniality (Stein et al., 2022). Critics advocating this perspective also question the fundamental historical role of education in perpetuating unsustainability (Bessant et al., 2015; Chandra, 2014; Kopnina and Cherniak, 2016; Stein et al., 2022; Tikly, 2019). They argue that education has been complicit in reinforcing hegemonic knowledge paradigms and socio-political systems (as discussed in Theme 3 and 4), which they identify as the underlying cause of unsustainability. Overall, what they call for is an imperative to

demystify education as the solution or the way forward. It is important to consider the epistemic implications of such a stance.

These critiques are inherently epistemological in character, as they engage in inquiries regarding the nature of education in general and within the context of ESD, and delineate what it ought to encompass in pursuit of sustainability objectives. Consequently, they underscore the epistemic tensions surrounding the determination of educational objectives within both education (and ESD, by extension), highlighting fundamental philosophical questions on the role and aim of education. It is also reflected in the criticisms of ESD which argue that ESD signifies an instrumental shift in education (Manteaw, 2020) and critics that argue that ESD may reduce education to a form of prescription of predetermined action (Olsson, 2022b) which can be linked to epistemic questions on education. Additionally, it is also reflected in the criticism of classical Western education paradigms within which contemporary education operates, advocating for the adoption of more holistic, complexity thinking, and transdisciplinary approaches (Nguyen et al. 2021). All these critiques, signal a debate on fundamental epistemic aims of education (see, Siegel, 2004). It is important to consider the implications for epistemic injustice when navigating this highly contentious educational terrain.

In considering epistemic injustice as a wrong done to individuals in their capacity as knowers (Fricker, 2007), it becomes imperative to reiterate the marginal positioning of these knowers within prevailing hierarchical structures. When considering the marginal position of a knower, it is possible to ask, what degree of agency do those occupying marginal positions possess to participate meaningfully in the contemporary debates in education? How do they navigate the complexities of bearing the interpretive burden and bridging linguistic boundaries? Even in their attempts to contribute their knowledge and experience to these debates, what assurances exist that the dominant interpretive frameworks will adequately acknowledge and incorporate their perspectives? These questions suggest a spectrum of potential epistemic injustices that may emerge within a field characterized by conflicts and debates. What I am essentially highlighting is that, a contentious educational terrain can become a fertile ground for epistemic injustice (see, also, the discussion in Theme 1). Accordingly, it is crucial to navigate it with critical reflexivity.

Another epistemic consideration in these critiques pertains to the promotion of student-centered learning, which some scholars argue, reflects a culturally specific belief in ontological individualism, often associated with Western ideologies (Komatsu et al. 2021). This critique indicates the epistemological implications for local contexts with differing ontological viewpoints, particularly those that prioritize hierarchical social and cultural structures. In essence, the emphasis on student-centered learning may not align with the ontological perspectives prevalent in societies where collective identity and social hierarchy hold greater significance. What this warns is that the uncritical adoption of educational approaches rooted in Western epistemologies can perpetuate epistemological injustice. By prioritizing student-centered learning without considering the ontological diversity of local contexts, educational systems risk marginalizing alternative ways of knowing and being reinforcing existing power dynamics. This underscores the significance of acknowledging diverse epistemological perspectives and varied ontological stances within education, thus exemplifying the challenges of advancing global policies in education. Neglecting to do so can readily result in instances of epistemological injustice such as curricular injustice or coloniality of knowledge. This argument can be advanced to other educational ideals such as “critical thinking”, “autonomy” and “problems solving” etc., that are readily advanced within ESD.

In summary, this theme is evidence of an ongoing epistemological debate with regards to epistemic aims of education; socio-epistemological dimensions of educational methods and curricular content; social justice concerns revolving around inclusion, exclusion, and multiculturalism; issues surrounding epistemic issues concerning teaching and indoctrination, etc. It is crucial to contextualize these debates within the broader global landscape marked by significant inequality. Across the world, disparities in access to resources, opportunities, and representation persist, shaping the educational experiences of individuals and communities. Within this context, these epistemological debates take on an added significance. Within this unequal landscape, there is a heightened risk of epistemic injustices, where certain individuals or groups are systematically marginalized or excluded from participating in knowledge production and dissemination processes. These injustices can manifest in various forms, including the neglect or dismissal of alternative perspectives, the reinforcement of dominant narratives, and the perpetuation of existing power structures. Moreover, epistemic injustices can intersect with other forms of injustice, such as economic inequality and social marginalization, further exacerbating inequities within educational systems.

Ultimately, it is important to recognise that, "[e]pistemologies have power. They have the power not only to transform worlds, but to create them. And the worlds that they create can be better or worse" (Berenstain et al., 2022, p. 283). It is crucial to acknowledge that education serves a function in this creation. Accordingly, it is imperative to not only acknowledge education's role in shaping unjust worlds but also recognize its role in contributing to the construction of more just and equitable worlds. In light of this, it is critical to interrogate the very nature of knowledge and knowing and examine the ways in which the nature of knowing my perpetuate injustice. In foregrounding this, we may be able to uncover avenues to challenge entrenched paradigms and foster more just approaches to sustainability education.

6.2 Implications of the findings

To recapitulate, I have delved into the criticisms surrounding ESD through the lens of epistemology in this chapter. I have expanded the discussion around the limitations of ESD to encompass the broader epistemological implications inherent within these critiques. By doing so, I aimed to highlight how the limitations of ESD may not only affect its effectiveness as an educational framework, but may also contribute to larger issues of epistemic injustice. This examination underscores the interconnections between education and epistemic justice, highlighting the importance of addressing these complexities in efforts to cultivate more sustainable, inclusive, and equitable educational practices.

The foregoing discussion underscores the multifaceted nature of debates and critiques surrounding ESD, revealing numerous avenues through which this global policy framework may engender epistemological injustices. It is evident across all thematic categories that, hermeneutical marginalization may manifest due to the hegemonic status enjoyed by dominant interpretive frameworks. The hegemonic status also has ramifications for perpetuating institutional hermeneutical marginalization. Furthermore, it imposes the interpretive burden on individuals occupying marginalized positions, which is frequently exacerbated by linguistic injustices and other forms of institutional practices. Considering the educational dimension, it becomes apparent that injustices can emanate from both curricular biases and the coloniality of knowledge. These aspects of epistemic injustice are highlighted through the criticism

surrounding ESD, indicating the urgent need for a critical revaluation and restructuring of educational policies and practices to foster greater inclusivity and equity.

A striking observation arises in the examination of critiques of ESD: their interconnections. Rather than existing in isolation, these critiques intertwine and overlap, forming a complex web of interconnected themes and concerns. This intersectionality underscores the interrelated nature of the issues within ESD. For instance, consider Theme 4, which discussed the critical concerns surrounding Anthropocentricism. This thematic strand intersects notably with Themes 1, 2, 3, and 5, each of which addresses distinct yet interconnected aspects of ESD discourse. Similarly, consider Theme 3, which engages with the critical discourse regarding the alignment of ESD initiatives with or against prevailing socio-political paradigms, that has an intrinsic link to all thematic categories. Certainly, Theme 5, which encompasses facets specific to education, inherently bears implications for all other thematic categories. What I wish to highlight is that, by recognizing and exploring these intersections, we can gain deeper insights into the multifaceted challenges facing ESD and the need for holistic approaches to address them. I contend that, while in-depth investigations into insulated themes or topics are indispensable, equal importance lies in exploring the ramifications of these isolated themes or topics to the broader field of study.

The interconnections also emphasize that, while Cummings et al. (2023) have formulated this framework hierarchically, the relationships among concepts relating to epistemic injustice appear to be more akin to a network, with interconnectedness surpassing the hierarchical representation. This acknowledgment accentuates the dynamic and intricate nature of epistemic injustice, which frequently entails complex interrelations and feedback loops among different components. While the hierarchical arrangement serves as a helpful organizational tool for analysis, it risks oversimplifying the dynamic exchanges and feedback mechanisms inherent in epistemic injustice phenomena. Moreover, recognizing the network-like nature of these relationships underscores the need for a more nuanced understanding of epistemic injustice. Such an understanding would acknowledge the fluidity and complexity of interactions between various factors, including power dynamics, social structures, and individual and communal agency. By moving beyond simplistic hierarchical models, it is possible to better capture the intricacies of epistemic injustice and develop more effective strategies for addressing its manifestations in diverse contexts. Perhaps, a next step in this study could involve an attempt to delineate this network, mapping out the connections and interactions between different elements of epistemic injustice. This endeavour could provide valuable insights into the underlying mechanisms driving epistemic injustices within a global policy framework such as ESD, and facilitate the development of more comprehensive frameworks for analysis and intervention.

Ultimately, this research underscores the complex and contentious nature of knowledge within the ESD realm. Consequently, it recognises the existence of numerous truths and varied avenues for progress. When selecting which truths to prioritize or which paths to follow in the ESD landscape, it is crucial to ensure that these decisions are made without perpetuating epistemic injustice. Recognizing this necessity prompts us to embrace epistemic humility in the evaluation of knowledge claims, an acknowledgment of the limitations of our own knowledge and an understanding (Kidd, 2016; Parviainen et al., 2021; Potter, 2022; Walker & Martinez-Vargas, 2022; Waterman, 2022). It stems from a commitment for ethical academic practice championing reflexivity, accountability, inclusivity and openness to other worldviews in our scholarly endeavours. Ultimately, such a commitment can ensure that we critically engage with the biases and prejudices embedded in the choices we make and the truths we champion within ESD and beyond.

I must acknowledge that while focusing extensively on injustice, I may have overlooked the agency of individuals in addressing these injustices. As pointed out by scholars, in the presence of oppression, there is also resistance against it (Collins, 1991, 2000, as cited in, Pohlhaus, Jr., 2017). Similarly, in contexts marked by epistemic injustice, there is resistance to such injustice as well (Berenstain et al., 2022). While it is crucial to highlight injustices, it must not come at the cost of overlooking the power of human agency in resisting injustice. Thus, alongside analysis of ways in which epistemic injustice may take place, it is imperative to celebrate the agency of individuals and resistant epistemic communities in their efforts to combat injustices. I believe this is an important future direction to explore in a study of this nature.

However, such an acknowledgement does not reduce the importance of expanding our understanding on the ways in which epistemic injustice takes place. I believe, it is imperative to recognize the inherent inequality in the world. If interventions intended to mitigate this inequality end up perpetuating it instead, their commitment becomes questionable: if ESD inadvertently reinforce existing disparities or create new forms of inequality, their efficacy and ethical justification comes into question. In other words, if efforts to promote equality and justice ultimately result in further entrenching inequality and injustice, the intended purpose of the intervention becomes undermined. This underscores the importance of careful planning, implementation, and evaluation of policies and programs aimed at fostering social justice and equitable outcomes. It also highlights the need for a nuanced understanding of the complex dynamics of inequality and the potential unintended consequences of well-meaning interventions such as ESD.

6.3 A few cautionary notes

I believe it is crucial to highlight a few cautionary points in this discussion. In this discussion, I have intentionally avoided the establishment of a clear division between the centre and the margins through categorical labels of belonging. This decision stemmed from the recognition that marginalized peoples exist even within regions typically considered part of the Global North or belong to identity categories that are often considered privileged. Additionally, I have refrained from making a distinct separation between individuals based on their placement within these constructs and the association of marginal ideas solely with those positioned on the margins. I recognize that individuals situated within the center can also espouse counter-hegemonic ideas and perspectives that challenge dominant narratives. This approach seeks to dismantle rigid binaries and acknowledge the fluidity and complexity of social positioning and ideological orientations within academic and broader societal contexts. By refusing to essentialize identities or ideas based on their perceived location within hierarchical structures or categorical labels of belonging, I aim to cultivate a more nuanced understanding of power dynamics and epistemic diversity. By refraining from constructing a simplistic dichotomy, I aimed to acknowledge the complexity and diversity within all contexts, striving to foster a more inclusive understanding of social dynamics and power structures in contemporary academia. Moreover, this approach underscores that individuals from marginalized communities or those advocating for marginalised views are not uniformly positioned outside of mainstream discourse or influence, challenging assumptions about the homogeneity of experiences within both the centre and the periphery.

It is also crucial to emphasize that my intention is not to romanticize or idealize every marginal perspective. While recognizing the importance of diverse epistemologies and marginalized voices, I do not contend that every marginal perspective inherently possesses superiority or virtue. It is essential to approach the understanding of marginal epistemologies with a critical lens, recognizing that like any other perspective, they can vary widely in their insights, values, and limitations. By avoiding the creation of a romanticized description, I aim to foster a more balanced appreciation for the diverse range of experiences and viewpoints present within marginalized communities. This approach encourages a more comprehensive understanding that respects the agency, diversity, and inherent humanity of all individuals, regardless of their position within mainstream or marginalized contexts. In sum, what I have attempted to underscore is not the inherent superiority of all marginal perspectives, but rather the existence of marginalized viewpoints often overlooked in contemporary discourse. This emphasis aims to draw attention to the individual, collective, structural, and systemic mechanisms by which these perspectives are marginalized. It advocates for acknowledging and addressing the epistemic inequalities present within social and academic spaces. Furthermore, it advocates for adopting humility in our social and academic practices, especially a form of epistemic humility, recognizing that our understanding is enriched by engaging with diverse perspectives and experiences, irrespective of their position within prevailing social and academic hierarchies.

While I have chosen to use the framework of epistemic injustice developed by Cummings et al. (2023) in this study, I also recognise that in choosing to use one lens to view epistemic injustice, I may also engage in an activity that may inadvertently perpetuate epistemic injustice. I am emphasising here an aspect that David Owen terms “aspectival captivity,” which explains our tendency to repress alternate ways of reflection (2003, p. 85–88, as cited in, Pohlhaus, Jr., 2017, p. 16). According to Pohlhaus, Jr. (2017), “[c]alling attention to particular epistemic activities and institutions, necessarily downplays and omits others. Doing so, even in the service of identifying particular epistemic injustices, has the potential of fixating attention in ways that might render inconceivable other epistemic injustices as yet unarticulated and best understood by attending to altogether different aspects of epistemic life” (p. 16). Essentially, want I am acknowledging here is the limits of my analysis. This acknowledgement allows me to remain open to other alternative possibilities and their diverse ways of knowing. I take this stance with the understanding that, “as finite temporal beings, “we simply do not have the capacity to track all the implications of our positions on any given issue”” (Dotson, 2012a, 24–25, as cited by, Pohlhaus, Jr., 2017, p. 16). So, I refrain from asserting that this work is definitive. Instead, I remain receptive to alternative possibilities.

6.4 Summary

In this discussion, my objective has been to analyse criticisms of ESD vis-a-vie the theoretical framework in epistemic injustice. By examining these critiques through this lens, I have demonstrated the ways in which epistemic injustice may manifest within a contentious academic landscape. This lens draws attention to the inequalities inherent to our global, social, and academic landscape and the ways in which these inequalities can perpetuate individual, collective, structural, and systemic forms of epistemic injustices. In essence, this study advocates for recognizing and rectifying the epistemic inequalities inherent in social and academic environments. Through this critical analysis, I underscore

the imperative for redressing epistemological injustices within the realms of education, sustainability, and beyond.

7 Conclusions and ways forward

"To communicate we all need an audience willing and capable of hearing us. The extent to which entire populations of people can be denied this kind of linguistic reciprocation as a matter of course institutes epistemic violence" (Dotson, 2011, p. 238, as cited in, Tuana, 2017, p. 129).

7.1 Concluding remarks

This study undertakes a systematic examination of the theoretical criticisms levelled against ESD. Central to this inquiry is an epistemological lens through which these critiques are scrutinized. The aim was to discern whether these criticisms offer insights into instances wherein ESD potentially perpetuates or engenders epistemic injustices. Such an analysis is predicated upon the notion that the attainment of social justice fundamentally hinges upon the achievement of epistemic justice within educational frameworks. By treating critiques as insightful portals into diverse worldviews, this inquiry acknowledges their function beyond mere expressions of dissatisfaction or disagreement, recognizing them as manifestations of underlying epistemic assumptions and perspectives. Through this analytical framework, the study elucidates the complex dynamics at play in ESD's engagement with diverse knowledge systems and its capacity to serve as a bridge across epistemic divides. Ultimately, the study seeks to strengthen ESD's potential to engender substantive dialogue, nurture inclusivity, equity, and sustainability within diverse socio-cultural and epistemic frameworks.

Let me summarise my key findings:

I. ESD is a contentious field and the critiques of ESD span a wide range of concerns, reflecting the complexity of the subject. Despite the heterogeneity of these criticisms, they often intersect and overlap, revealing interconnected themes and shared underlying issues. These intersections highlight the interrelated nature of the challenges facing ESD, emphasizing the need for a comprehensive and holistic approach to addressing them. Recognizing the intersections is essential to gain deeper insights into the underlying dynamics at play and develop more successful strategies for advancing sustainability education.

II. The contentious nature of the criticisms of ESD underscore epistemic tensions revealing numerous ways in which epistemic injustices can arise. These injustices are heterogenous, and encompass injustices stemming from individual, collective, structural, and systematic injustices.

III. While individual, collective, structural, and systematic injustices are presented as a hierarchical model in the theoretical framework developed by Cummings et. al. (2023), the intersections between criticisms illustrate that these injustices resemble a network, highlighting intricate interconnections. This perspective underscores the dynamic and complex nature of epistemic

injustice, characterized by multifaceted interrelations and feedback loops among various components and manifestations.

IV. The notion of justice serves as a central tenet in ESD, guiding efforts toward equitable, inclusive, and responsive sustainability efforts. This core principle aims to ensure that ESD prioritizes the needs and rights of all beings, particularly those marginalized or disadvantaged, while also promoting intergenerational and interspecies well-being. However, the contentious nature of the critique surrounding ESD underscores its potential to engender and/ or perpetuate epistemic injustice. It raises critical questions with regards to ESD's pluralistic and epistemically inclusive aims. Consequently, it calls into question ESD's effectiveness and ethical validity.

V. Given that epistemic justice is a prerequisite for social justice, the study ultimately highlights the critical need to address both aspirations in tandem, particularly within the context of ESD

Essentially, this study raises fundamental questions regarding ESD's capacity for facilitating successful knowledge co-production among diverse worldviews. It explores the tension between ESD's aspirations for plurality and epistemic inclusivity, and the potential hegemonic tendencies that could lead to epistemic injustices. By viewing critiques as windows into different worldviews, the study acknowledges them not merely as expressions of disagreement, but also as reflections of underlying epistemic assumptions and perspectives. Through this lens, the study raises concerns about ESD's potential to successfully bridge epistemic divides.

Overall, this study highlights the contentious nature of knowledge within the ESD landscape. Accordingly, there are multiple truths and myriad ways forward. When determining which truths to uphold or which paths to pursue in the ESD landscape, it is imperative to ensure that these choices are made without engendering epistemic injustice. Recognizing this imperative calls us to embrace epistemic humility, a humble acknowledgment of the limitations of our own knowledge and the recognition that truth is often multifaceted (Kidd, 2016; Parviainen et. al., 2021; Potter, 2022; Walker et. al., 2022; Waterman, 2022). Cultivating this form of humility is a prerequisite for dialogue. The interconnected and complex nature of contemporary crises, which has necessitated a response like ESD, entails that no single entity can provide the solution or the answer. In fact, this complexity necessitates collaboration, whether it is transdisciplinary or transnational, compelling us to transcend our (epistemological) silos. In this effort, embracing epistemic humility becomes not only a virtue but a necessity. It fosters a necessary condition to navigating the ever-evolving landscape of knowledge within ESD and beyond.

7.2 Ways forward

I am aware that a significant limitation of this study is its exclusive focus on critical perspectives of ESD, which results in the neglect of studies that appreciate and support ESD initiatives. By narrowing the scope to critical viewpoints, the analysis may overlook important insights and successes achieved by ESD efforts. This limitation may restrict the study's ability to provide a balanced assessment of the effectiveness and impact of ESD initiatives, potentially omitting valuable perspectives and hindering the development of comprehensive recommendations for future action. Despite this limitation, the

findings of the study remain pertinent. Focusing on critical perspectives of ESD, I have highlighted notable challenges and potential deficiencies in current sustainability education approaches, particularly concerning the perpetuation of epistemic injustices through a global policy like ESD. Therefore, while acknowledging this limitation, the study's findings offer important contributions to the ongoing discourse surrounding sustainability education.

In considering ways forwards, I must acknowledge that I am inspired by a conceptual tool proposed by Silvestru (2023). It has urged me to develop a conceptual tool in relation to this study that could help in our exploration of the ways forward. I envision the journey ahead as being guided by principles of epistemic humility ultimately enabling the achievement of epistemic justice as a condition for social justice. As I envision this journey, I describe below a conceptual tool that could assist us in navigating its course. This conceptual tool encompasses elements such as **equity, reflexivity, accountability, plurality,** and **holism** informed by the findings of this study.

- **Equity** underlines an aspirational ideal in our pursuit of justice. It is an imperative withing a global space that is diverse, yet, unequal. Positioning equity as a foundational principle is essential to redress historical and on-going injustices stemming from power imbalances, thereby creating avenues for empowering the marginalized.

- **Reflexivity** encompasses self-reflection and critical awareness, enabling us to recognize and interrogate the biases that underpin our knowledge paradigms. Such introspection is essential for mitigating epistemic injustices, as it allows us to not only recognise the inherent biases in our epistemic practices but also envision ways to redress injustices.

- **Accountability** entails the obligation of academics to critically assess their roles in epistemic practices and their positions in epistemic hierarchies. It is a commitment to recognising not only the power dynamics within the academia but also the potential ramifications of these dynamics on the wider communities they engage with. It promotes a form of ethical academic practices, ensuring that research prioritize the well-being and rights of all stakeholders involved. It also acknowledges that knowledge transcends academic boundaries and that knowers occupy spaces outside the academia.

- Embracing **plurality** is crucial for fostering a more inclusive approach to knowledge production. Such an approach recognizes and incorporates epistemological diversity, acknowledging that knowledge extends beyond hegemonic paradigms and that epistemologies exist in the plural sense of the word. Valuing the plurality of worldviews, creates the space to cultivate a more nuanced understanding of our complex realities while driving us to remain open to alternative possibilities.

- **Holism**, both within the natural world and epistemological realms, encapsulates the profound interconnectedness inherent in our understanding of knowledge and existence. It transcends traditional boundaries, whether ontological, disciplinary, or epistemological, fostering an appreciation for the interdependence of all facets of life and knowledge. Embracing holism enables us to explore the complex interactions among diverse worldviews, facilitating a deeper understanding of the complexities within ecosystems and knowledge systems alike.

Overall, this conceptual tool offers a promising way forward to navigate the complexities of an epistemically diverse yet inequitable social and academic space. By incorporating elements such as equity, reflexivity, accountability, plurality, and holism, this framework provides a structured approach to addressing the challenges inherent in sustainability education and beyond ultimately offering a pathway towards a more equitable and inclusive social and academic space. It is needless to state that this conceptual tool is far from complete or definitive. However, I believe it is still useful when navigating a global social and academic space that is epistemically and ontologically diverse, yet, inequitable. A future research direction could refine this further through an exploration of necessary conditions for epistemic justice.

Additionally, this study underscores the imperative for further research in several key areas. Firstly, there is a pressing need to delve into ESD-related work that takes a more appreciative stance towards its impact. While this study has primarily focused on examining the epistemological injustices within the critical research context of ESD, there remains a gap in understanding the broader landscape of positive contributions and successes within the field. Furthermore, the exploration of epistemological justice within the realm of ESD presents an intriguing avenue for future inquiry. Understanding what constitutes as epistemological justice within this context, i.e., adopting an inverse perspective, could allow for a more proactive examination of the mechanisms promoting fairness, equity, and respect for diverse knowledge paradigms. Investigating epistemological justice vis-a-vis this lens may encourage the identification and amplification of instances of equitable knowledge practices. Moreover, there is immense potential in investigating the interconnections between individual, collective, structural, and systemic forms of epistemological injustice within ESD. By adopting a more holistic approach, future researchers can uncover the complex dynamics at play and identify points of intervention for promoting epistemic justice. This entails moving beyond a hierarchical framework to embrace a more nuanced understanding of (in)justice that acknowledges the interconnectedness of various dimensions. Through such investigations, it is possible to contribute to the development of comprehensive models for fostering justice. Additionally, I am also intrigued by the interplay of epistemic injustice and/ or inequality with other forms of social injustice and inequality. More specifically, there is a need to map the intersections and dynamics between these injustices and inequalities. Overall, the opportunities for future research within this line of inquiry are endless.

7.3 Final acknowledgements

I want to take a moment to acknowledge the epistemic labour that precedes my own and enables me to undertake this study. This is inspired by Pohlhaus, Jr.'s (2017) similar acknowledgement in her own work. In this study, failing to acknowledge the contributions of those who have come before me would encourage a mindset that ignores the interconnectedness of our epistemic practice. My intellectual work is not independent; In fact, the thoughts I express here are only possible because of the dedicated work of those who have tirelessly highlighted injustices in our knowledge practices. It is presumptuous to assume that the extensive ways in which epistemic injustices may take place (in ESD or in any other subject of inquiry) could be fully encapsulated in one essay, by one individual, or within one particular epistemological injustice framework. So, I thank the readers for engaging with this study so far while remaining open to numerous other accounts of epistemic injustices with the understanding that even

those accounts do not represent a definitive understanding of the various manifestations of epistemic injustices. This stance is a call to remain open and receptive to further exploration and dialogue on this subject.

The world has long been characterized by its diversity across numerous dimensions, a true testament to its richness. Yet it is also plagued by inequality that manifest in myriad unjust ways. In the face of this reality, let us remain committed to striving for even the smallest measures that contribute to greater justice. Every effort, no matter how modest, plays a role in fostering a more equitable and inclusive world encompassing both humanity and broader web of life. As we navigate the complexities of our global community, let us continue to advocate for fairness and dignity for all beings regardless of their origin, circumstances, or the storied worlds they inhibit. By collectively embracing this commitment to justice, informed by an epistemic stance that values plurality, let us work towards a future where there is the space to thrive and contribute to the well-being of our shared existence.

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Appendices

Appendix 1 List of reviewed literature

Title	Authors	Year
Balancing the Tensions and Meeting the Conceptual Challenges of Education for Sustainable Development and Climate Change	Blum, Nicole;Nazir, Joanne;Breiting, Soren;Goh, Kim Chuan;Pedretti, Erminia	2013
Re-Examining the Importance of Indigenous Perspectives in the Western Environmental Education for Sustainability: "From Tribal to Mainstream Education"	Chandra, Doreen Vikashni	2014
Education for sustainable development (ESD): Exploring theoretical and practical challenges	Kopnina, Helen;Meijers, Frans	2014
Neoliberalism, New Public Management and the Sustainable Development Agenda of Higher Education: History, Contradictions and Synergies	Bessant, Sophie E. F.;Robinson, Zoe P.;Ormerod, R. Mark	2015
The UN Decade of Education for Sustainable Development: Business as Usual in the End	Huckle, John;Wals, Arjen E. J.	2015
Neoliberalism and justice in education for sustainable development: A call for inclusive pluralism	Kopnina, Helen;Cherniak, Brett	2016
Hegemony and the Politics of Policy Making for Education for Sustainable Development: A Case Study of Vietnam	Bengtsson, Stefan Lars	2016
Reviewing Strategies in/for ESD Policy Engagement: Agency Reclaimed	Lotz-Sisitka, Heila	2016
Critical Reflections on the UNDESD: From the Perspectives of Informal Education in a Community Development Context	Noguchi, Fumiko	2017
Challenging the Concept of Ethical Literacy within Education for Sustainable Development (ESD): Storytelling as a Method within Sustainability Didactics	Franck, Olof;Osbeck, Christina	2018
Sustaining the Life-Chance Divide? Education for Sustainable Development and the Global Biopolitical Regime	Hellberg, Sofie;Knutsson, Beniamin	2018
Teaching Sustainability in Norway, China and Ghana: Challenges to the UN Programme	Witoszek, Nina	2018

Views on Education for Sustainable Development (ESD) among Lecturers in UK MSc Taught Courses: Personal, Institutional and Disciplinary Factors	Melles, Gavin	2019
Education for Sustainability in the Parks: A Project Inspired by Chet Bowers	Morris, Nicholas A.	2019
Seeking Sustainability Competence and Capability in the ESD and HESD Literature: An International Philosophical Hermeneutic Analysis	Shephard, Kerry;Rieckmann, Marco;Barth, Matthias	2019
More of the Same: A Critical Analysis of the Formations of Teacher Students through Education for Sustainable Development	Sjögren, Hanna	2019
Sustainable Development for Whom? A View from Oceania	Thaman, Konai Helu	2019
Managing the GAP between Rich and Poor? Biopolitics and (Ab)Normalized Inequality in South African Education for Sustainable Development	Knutsson, Beniamin	2020
Education for the Future? Critical Evaluation of Education for Sustainable Development Goals	Kopnina, Helen	2020
Education for Sustainable Development Goals (ESDGs): What Is Wrong with ESDGs, and What Can We Do Better?	Kopnina, Helen	2020
Education and Learning in Sustainable Development: Foregrounding an Emergent Discourse	Manteaw, Bob Offei	2020
Ecopedagogy: Teaching Critical Literacies of 'Development', 'Sustainability', and 'Sustainable Development'	Misiaszek, Greg William	2020
Education to Transform the World: Limits and Possibilities in and against the SDGs and ESD	Griffiths, Tom G.	2021
Bureaucratic Exercise? Education for Sustainable Development in Taiwan through the Stories of Policy Implementers	Huang, Ying-Syuan;Harvey, Blane;Asghar, Anila	2021
Intersections and Collaborative Potentials between Global Citizenship Education and Education for Sustainable Development	Khoo, Su-ming;Jørgensen, Nanna Jordt	2021
Segmented Prizing: Biopolitical Differentiation in Education for Sustainable Development	Knutsson, Beniamin	2021
Student-Centered Learning and Sustainability: Solution or Problem?	Komatsu, Hikaru;Rappleye, Jeremy;Silova, Iveta	2021

Recontextualising Education for Sustainable Development in Pedagogic Practice in Vietnam: Linking Bernsteinian and Constructivist Perspectives	Nguyen, Thao Phuong;Leder, Stephanie;Schruefer, Gabriele	2021
From “education for sustainable development” to “education for the end of the world as we know it”	Stein, Sharon;Andreotti, Vanessa;Suša, Rene;Cash Ahenakew;Čajková, Tereza	2022
Caribbean Dreams: Education for More than "Just" Sustainable Development	Brissett, Nigel O. M.	2022
'We Must Urgently Learn to Live Differently': The Biopolitics of "ESD for 2030"	Bylund, Linus;Hellberg, Sofie;Knutsson, Beniamin	2022
What's in a Name? The Signifiers and Empty Signifiers of Environmental Sustainability Education: Implications for Teacher Education	Karrow, Douglas D.;Fazio, Xavier;Zandvliet, David	2022
An Ecopedagogical, Ecolinguistical Reading of the Sustainable Development Goals (SDGs): What We Have Learned from Paulo Freire	Misiaszek, Greg William	2022
Empowering Political Engagement with Unsustainable Actions: The Possibilities and Limitations of Teaching Guides for Climate Change Education	Olsson, David	2022
Facilitating Democratic Processes for Sustainability: The Possibilities and Limitations of Teaching Guides for Climate Change Education	Olsson, David	2022
Representations of Humans, Climate Change, and Environmental Degradation in School Textbooks in Ghana and Malawi	Ress, Susanne;Kendall, Nancy;Friedson-Ridenour, Sophia;Ampofo, Yaa Oparebea	2022
The Holocene Simulacrum	Wallin, Jason James	2022
Sustainable Learning and Some Counterculture Values in Jamaica: A Rastafarian Spiritual Ethos to ESD	De Angelis, Romina	2023
Perceived interest in learning sustainability competencies among higher education students	Hyytinen, Heidi;Laakso, Senja;Pietikäinen, Janna;Ratvio, Rami;Ruippo, Lotta;Tuononen, Tarja;Vainio, Annukka	2023
Research Approaches in ESD/ESE: Reflections of Swiss Researchers	Pache, Alain;Gey, Noémie;Lausselet, Nadia;Mühlematter, Yves;Blandenier, Gilles;Massiot, Philippe;Pellaud, Francine;Gay, Philippe	2023
Classical paradigms versus complexity thinking in engineering education: an essential discussion in the education for sustainable development	Sigahi, Tiago FAC;Izabela Simon Rampasso;Anholon, Rosley;Sznelwar, Laerte Idal	2023

Discovering Earth and the Missing Masses--Technologically Informed Education for a Post-Sustainable Future	Takkinen, Pasi;Pulkki, Jani	2023

Appendix 2 Quality appraisal and mapping the themes

Title	Research questions	Theory	Methods	Results	Linked Themes
Balancing the Tensions and Meeting the Conceptual Challenges of Education for Sustainable Development and Climate Change	This paper addresses one of the key challenges for work on education related to environmental concerns, and especially the pressing issue of climate change: the overall conceptualisation of central ideas such as Environmental Education (EE), Education for Sustainable Development (ESD) and Climate Change Education (CCE). It is a challenge both in terms of the research which seeks to develop and engage with the concepts themselves and also in terms of the influences of those complex concepts on policy and practice in particular locations: What do these concepts mean in diverse contexts and amongst diverse actors? What are the connections and disconnections between existing perspectives? What are the impacts of these different understandings on educational policies and practice at various levels in different locations (e.g. local, national, regional, international)?	Not clear	Data collection focused first on formal policy documents at the national level, second on relevant published research, and third on local or regional practice. This process was designed to produce a relatively comprehensive account of policy and policy climate, supported (where available) by scholarly research and enriched by concrete examples of ESD and CCE practice. Evidence from Denmark, Singapore, Canada and the UK were considred	Debates about how EE, ESD and CCE are conceptualised remain highly relevant, not just to academic work itself, but also to wider international discussions regarding both the current and potential relationships between conceptual understanding, policy and practice	1, 2
Re-Examining the Importance of Indigenous Perspectives in the Western Environmental Education for Sustainability: "From Tribal to Mainstream Education"	The objective of this paper is to highlight the role of indigenous knowledge systems in the fight towards ecological sustainability, outlining its strengths for education and for sustainable practices at global level.	Modernity, post-modernity	Multiple: literature, case study	The outcome of this paper suggests that, based on the case studies on some societies, the validity of indigenous knowledge systems still prevails, but more research is required in order to test for its application at a global level with Western scientific techniques.	2, 4, 5

Education for sustainable development (ESD): Exploring theoretical and practical challenges	This article explores the challenges posed by the conceptual framework and diversity of practice of education for sustainable development (ESD).	Not clear	Uses a general review approach, covering literature that provides an overview of the concepts and practices of ESD, as well as program evaluation studies. Additionally, qualitative evaluation of EAATSD scale with students of higher professional education was conducted, using in-depth interviews and dialogue with individual students as well as classroom discussions.	It was found that there are wide and inconclusive debates about the aims of ESD based on the critique of sustainable development discourse in general and instrumentalism embedded in ESD in particular. According to the qualitative evaluation, EAATSD scale can be used for testing anthropocentric and Ecocentric Attitudes Towards Sustainable Development in students of higher education. Based on these results, this scale was found to be revealing of the critical view of paradoxes and challenges inherent in multiple goals of sustainable development as well as useful for testing anthropocentric and ecocentric attitudes in students of higher education.	1, 2, 3, 4, 5
Neoliberalism, New Public Management and the Sustainable Development Agenda of Higher Education: History, Contradictions and Synergies	This paper explores the ideological and the practical relationship between neoliberalism and New Public Management (NPM) and the sustainable development agenda of western higher education. Using the United Kingdom and specifically English universities as an example, it investigates the contradictions and the synergies between neoliberal and NPM ideologies and the pursuit and practice of the sustainability agenda, focusing in particular on education for sustainable development (ESD) and ESD research.	Not clear, neoliberalism and managerialism in Western higher education	Policy and iterature analysis: neoliberal, and new public managemnt impact on Higher education	This paper reveals a range of challenges and opportunities in respect of advancing sustainability in higher education, within the prevailing neoliberal context. It illustrates using examples how neoliberal and managerialist control mechanisms, which govern institutional, departmental and individual academic, as well as student behaviour, are working conversely to both drive and limit the sustainability education agenda.	3, 5
The UN Decade of Education for Sustainable Development: Business as Usual in the End	The central argument is that the Decade represents ‘business as usual in the end’ since the majority of those who determined its rationale and developed educational projects and programmes under its umbrella failed through inadequate guidance, misplaced idealism or the censoring of more critical ideas and content, to face up to current global realities.		An analysis of the literature supporting the UN Decade of Education for Sustainable Development and a sample of its key products, DESD publications	ESD failed to acknowledge or challenge neoliberalism as a hegemonic force blocking transitions towards genuine sustainability.	3, 5
Neoliberalism and justice in education for sustainable development: A call for inclusive pluralism	This article questions whether the benefits of sustainable development should be meant for humans only, and whether concern for environmental sustainability should be limited to the environment’s ability to accommodate social and economic equity.	Relativistic pluralism	Literature analysis	It is argued that the dominant form of pluralism employed within education is essentially anthropocentric, prioritizing social justice over interests of more-than-humans. This article will argue for a bolder move in the direction of inclusive pluralism through eco-representation and reinstatement of education for nature.	4, 5

Hegemony and the Politics of Policy Making for Education for Sustainable Development: A Case Study of Vietnam	This study challenges assumptions made about structural power as expressed through Education for Sustainable Development (ESD) policy and politics of education. Focusing on the concept of sustainable development (SD) and ESD, the research examined the culturally contextualized question: How should we understand the relationship between these policy concepts, structural power, hegemony and the hegemonic discourses that articulate them?	Not clear	A case analysis of the political and educational history of Vietnam is used; discourse analysis of relevant policy documents	Assumptions on the hegemonic potential of SD and ESD may or may not be appropriate, or adequate, for understanding that relationship at the depth required for critical purposes.	2, 5
Reviewing Strategies in/for ESD Policy Engagement: Agency Reclaimed	A response article, I draw on critical realist perspectives to engage with the argument put forward in Bengtsson (2016), which sees agency as an ontological necessity for Education for Sustainable Development (ESD) policy engagement.	Westphalian-inspired state-centric perspective	Argumentative, literature analysis	The study suggests that public sphere thinking and associated conceptions of agency require expansion, which is offered from postcolonial and decolonization literature, critical realism, ontological experiences, and reflection on Environmental Education (EE) /ESD policy in the southern African region.	2, 5
Critical Reflections on the UNDESD: From the Perspectives of Informal Education in a Community Development Context	This article proposes the need for careful reflection on what the UNDESD regarded as ‘success’ at the end of the decade from informal education in a community development context, and particularly, marginalized peoples’ perspectives. It focuses on the gap between what the UNDESD highlighted (the areas of formal education and schooling) and what it overlooked (informal education in a community development context).	Not clear.	Analysi of literature	Informal education for sustainable community development is needed to support the UN’s Sustainable Development Goals by 2030, and decoloniality is a potential theoretical approach to this issue.	1, 5
Challenging the Concept of Ethical Literacy within Education for Sustainable Development (ESD): Storytelling as a Method within Sustainability Didactics	The overarching aim of this paper is to present some prerequisites for the development of narrative methods that focus on the vision of a good society without compromising individual integrity. Is it possible to develop ESD in a ways that highlight global challenges with a focus on justice and equity without either, as within post-political romanticism, pretending that social sustainability is a non-controversial ethical goal, or, as within liberal individualistic approaches, claiming that no one may escape from the demands of action competence, which, it is claimed, paves the way for making social sustainability a reality?	Narrative theory, storytelling	Analysis of children's books	The recognition of the concepts of sustainability and responsibility as non-axiomatic and contextually interpretable, is a prerequisite for the development of a sustainability education which neither neglects the fact of pluralism, nor sanctions presumably unequivocal and universal demands about how all people, including children, should act in relation to identified global challenges.	1, 5

Sustaining the Life-Chance Divide? Education for Sustainable Development and the Global Biopolitical Regime	What is being sustained in education for sustainable development (ESD)?	Biopolitical theory	Literature analysis	In previous research that has dealt with global aspects of ESD, a dividing line can be drawn between scholars who emphasize tendencies towards neoliberal homogenization and those who highlight contingency, local re-articulations and spaces of contestation. This paper offers a third theoretical position that while sharing a deep unease with global neoliberal government is primarily concerned with its 'will to divide'.	2, 3, 5
Teaching Sustainability in Norway, China and Ghana: Challenges to the UN Programme	The article compares how the UN-initiated education for sustainable development (ESD) has fared in three seemingly dissimilar countries: Norway, a wealthy,'post-materialist'liberal democracy, Ghana, a developing democratic country, and China, a fast catching-up, centrally-steered economy.	Not clear	The study – based on an analysis of national ESD programmes, schoolbooks and qualitative interviews with teachers and students discusses some of the pivotal reasons for the decline in ESD schooling in all three countries.	Our conclusions are that, apart from specific, cultural and political contexts which influence ESD, students' socio-environmental literacy in the examined countries has been affected by an ever more pervasive competitive and neoliberal mindset. Further, in all three cases, the agenda of'sustainable development' suffers from a 'narrative and mythical deficit': a lack of a mobilizing story, the absence of which reduces the attractiveness of sustainability ideals and inhibits their empowering potential	1, 2, 3, 4, 5
Views on Education for Sustainable Development (ESD) among Lecturers in UK MSc Taught Courses: Personal, Institutional and Disciplinary Factors	The relationship between espoused views on sustainability and development and these views institutionalized into the curriculum require further investigation.	Not clear	his active interview study enrolled a cohort of academics (n = 21) teaching into ten postgraduate UK taught masters degrees. Using active interviews and thematic discourse analysis, this study focused lecturer accounts of translating sustainable development into ESD, student attitudes and characteristics and course nature and content in relation to institutional, disciplinary, personal and other drivers and discourses. Thematic discourse analysis and NVivo 12 the study identified themes and discourses arising from the interview accounts.	Faculty accounts of sustainable development and ESD practice depend on personal ethics and experiences, disciplinary discourses and institutional drivers and arrangements. Rather than focusing on simple categorizations of views in abstract, progress toward transformational ESD should acknowledge the need for dialogue about the importance of a plurality of views and discourses.	1, 5

Education for Sustainability in the Parks: A Project Inspired by Chet Bowers	the study critique the ESD movement as fundamentally flawed due to its double-binds and metaphorical missteps, and I reconceptualize sustainability as a guiding vision rather than a target.	the double-bind as described by Chet Bowers	Literature analysis, autoethnographic reflections	Since its inception, the education for sustainable development (ESD) movement in higher education has been doomed. Its standards of sustainability, bound to measures of development which suggest human flourishing is equated with the western ideals, is precisely the double-bind Chet Bowers so passionately stood against. The study call for a shift from ESD to Victor Nolet's (2010) Education for Sustainability (EfS) and recontextualize the movement within the framework of community	1, 3. 4
Seeking Sustainability Competence and Capability in the ESD and HESD Literature: An International Philosophical Hermeneutic Analysis	The research described in this article explores the possibility that miscommunication or misunderstanding of basic concepts within these fields is contributing to slow progress towards their objectives.	a philosophical hermeneutic analysis to explore how the terms 'competence' and 'capability' are used within selected ESD/HESD papers.	Literature review	We identify substantial internal contradictions and inconsistencies with respect to differences between learners' abilities and their willingness to perform these abilities, and to the educational context in which these outcomes are sought.	1, 5
More of the Same: A Critical Analysis of the Formations of Teacher Students through Education for Sustainable Development	Despite the good intentions in policies promoting education for sustainable development (ESD), this paper shows that, as university scholars and teachers, we need to critically engage with how student subjectivities are formed when global initiatives materialise in local educational practices.		The analysis in this paper is based on focus groups with teacher instructors in Sweden, where the participants discuss how they work with education for sustainable development. The analysis focuses on how the teacher instructors discuss their students.	The analysis shows that the preferred teacher student has an active lifestyle, participates in public debates, is happy, and consumes eco-friendly goods, often in line with the teacher instructors themselves. In conclusion, the author argues that those engaging with education for sustainable development should seek to widen its scope by critically engaging with how those under education are formed through taken for granted norms of good intentions and education for sustainable development in the present.	1, 3, 5
Sustainable Development for Whom? A View from Oceania	The study problematize the notion of ESD by first providing a brief background of what ESD means to the international community by discussing the United Nations Decade of Education for Sustainable Development (DESD 2004-14) and then examine selected Pacific notions of ESD and their implications for formal education.	Not clear	Literature analysis	So, for me, in order for development to be sustainable for Pasifiki people, it has to be culturally inclusive for all. I know this is a huge ask in a region where education and development have been totally dominated by foreign cultures, their languages, knowledge systems, communication networks, and research paradigms, for over a century now. Consequently, any suggestion to shift from business as usual, looks almost impossible. However, I believe it is worth a try.	1, 2, 5

Managing the GAP between Rich and Poor? Biopolitics and (Ab)Normalized Inequality in South African Education for Sustainable Development	This paper queries how ESD programmes handle the lifestyle gap that separates rich and poor populations. The extreme inequality in South African education is well-documented by researchers. There is also a rich literature concerned with education for sustainable development (ESD) in the country. The relationship between these two phenomena has, however, been sparsely investigated.	Biopolitical theory	fieldwork conducted in South Africa	The paper further argues that the differentiation between populations in rich and poor settings implies a depoliticized notion of local 'realities' as something isolated and given, rather than relational and produced. While the overall findings suggest that ESD unfolds through a regime of practice wherein inequality has become effectively normalized,	1, 2, 3
Education for the Future? Critical Evaluation of Education for Sustainable Development Goals	Despite the willingness of many educational institutions worldwide to embrace the SDGs, given escalating sustainability challenges, this article questions whether ESDG is desirable as"an education for the future".	Not clear.	Literature analysis	With unreflective support for growth, far from challenging the status quo, the SDGs and consequently, the ESDGs, condone continuing environmental exploitation, depriving millions of species of their right to flourish, and impoverishing future generations. This article creates greater awareness of the paradoxes of sustainable development and encourages teaching for sustainability through various examples of alternative education that emphasizes planetary ethic and degrowth.	1, 3, 4
Education for Sustainable Development Goals (ESDGs): What Is Wrong with ESDGs, and What Can We Do Better?	his article will discuss social, environmental, and ecological justice in education for sustainable development (ESD) and Education for Sustainable Development Goals (ESDG).	Biospheric egalitarianism	An intervention in the form of an undergraduate course titled Politics, Business, and Environment (PBE) will be discussed. As part of this course, students were asked to reflect on the three pillars of sustainable development: society, economy, and environment, linking these to the fourth concept, ecological justice or biospheric egalitarianism.	The concept of sustainable development and, by extension, the ESD, places heavy emphasis on the economic and social aspects of sustainability. However, the ESD falls short of recognizing ecological justice, or recognition that nonhumans also have a right to exist and flourish. Some of the resulting exam answers are analyzed, demonstrating students' ability to recognize the moral and pragmatic limitations of the anthropocentric approach to justice.	4, 5
Education and Learning in Sustainable Development: Foregrounding an Emergent Discourse	While the ESD discourse has since evolved to become a pragmatic educational ideology and tradition; while many countries and institutions have embraced its ideals in practice, not a lot of attention has been given to the seemingly instrumentalization of education in the ESD discourse. This work foregrounds ESD as an emergent discourse	Emergent discourse	Critical discourse analysis	Through Discourse Analysis and Critical Discourse Analysis, the paper examines the coarseness of words used in creating the ESD discourse across time by paying close attention to texts ñ specific language use ñ in key discourse moments to understand how linguistic choices, power, and institutional structures have helped to create a role for education in sustainable development and how that has facilitated the formation of the ESD discourse.	1, 5

Ecopedagogy: Teaching Critical Literacies of 'Development', 'Sustainability', and 'Sustainable Development'	This article provides a critical analysis of reinventing environmental pedagogies to center the ‘reading’ of development framings through the following questions: ‘What is development?’, ‘Who is it for?’,and ‘What are the politics behind it?’	critical theories and Freirean educational theories	Literary analysis	Without ecopedagogical readings of ‘development’, acts of environmental violence under the guise of ‘development’ are grounded in shallow and narrowed understanding as described throughout the article, severely hindering democratic decision-making and further marginalizes development.	1, 3, 4, 5
Education to Transform the World: Limits and Possibilities in and against the SDGs and ESD	From a critical perspective, this paper considers the incompatibility of endless (compound) economic growth and capital accumulation, under capitalism, with the required CO2 reductions that the climate emergency demands.	Critical theory	Critical analysis	The paper shows how the ESD proposals reflect the orthodoxy of education as human capital formation for economic development, albeit within a reformed ‘green growth’ model	1, 3, 4, 5
Bureaucratic Exercise? Education for Sustainable Development in Taiwan through the Stories of Policy Implementers	In one of the first attempts to study the work of policy implementers within Taiwan’s ESD initiatives, this study examines links between national policy and practice in educational settings.	Not clear	Interviews with thirty policy implementers and about seventy hours of observation in the field	Taiwan’s nationwide ESD program has failed to prompt meaningful actions that address unsustainable development. Moreover, the government’s instrumental approach to promoting a system-wide ESD program in the face of inaction on sustainability concerns in other sectors risks reducing this work to a symbolic, or bureaucratic exercise.	3, 5
Intersections and Collaborative Potentials between Global Citizenship Education and Education for Sustainable Development	his article examines intersecting agendas and concerns in global citizenship education (GCE) and education for sustainable development (ESD) in the face of current global crises and pressures.	Critical praxis	The article elaborates on a conversation emerging from the Bridge47 Knowledge Exchange Partnership focused on critical global citizenship education, and discusses the tensions, ambiguities, limitations and implications for critical, transgressive and potentially transformative GCE + ESD.	The need for education beyond ethically individualist, depoliticised, utilitarian and ‘neoliberalised’ conceptions is more obvious than ever, as is the necessity of collective and mutual survival. However, critical collaboration requires a historical and contextual understanding of who or what is involved and their stakes. Positivist liberal and neoliberal frames reproduce monotonous assumptions that education must be narrowly funnelled towards economically instrumentalist purposes, and that it must embed individualistic and competitive values. Yet the current multiple crises of global society point to a great need for alternative, cooperative, solidaristic, relational and affective modes of knowing, doing and being.	3, 4, 5

Segmented Prizing: Biopolitical Differentiation in Education for Sustainable Development	The present paper engages with the prestigious UNESCOJapan Prize on Education for Sustainable Development, which annually honours three outstanding projects related to education for sustainable development (ESD).	Biopolitical theory	Critical analysis	While the award is global in scope and alludes to humanity's joint responsibility for the planet, the analysis shows that the winning organisations approach rich and poor populations around the world in entirely different ways; assigning to them different roles, responsibilities and lifestyles. ESD discourse thus displays a remarkable ability to accommodate the lifestyle divide that separates rich and poor; suggesting that inequality has become effectively normalised.	1, 2, 3, 5
Student-Centered Learning and Sustainability: Solution or Problem?	While discussions surrounding education for sustainable development (ESD) are diverse, most scholars and policy makers view student-centered learning (SCL) as axiomatic. In contrast, we argue that promoting SCL potentially stymies educational contributions to sustainability by extending a culturally specific belief in ontological individualism.	culture cycle	Empirical data at a country scale - hypothesis testing	the study first highlights that countries committed to SCL tend to be dominated by ontological individualism and then show that these same countries score lower on a range of social and environmental sustainability indices. Moreover, countries where the belief in ontological individualism reigns tend to be liberal market economies, an institutional arrangement largely ineffective or even detrimental to social and environmental sustainability. In raising these issues, we seek less to provide a definitive account of the key relationships than to catalyze a deeper conversation about how to reimagine the taken-for-granted logics of education as the sustainability imperative looms.	1, 5
Recontextualising Education for Sustainable Development in Pedagogic Practice in Vietnam: Linking Bernsteinian and Constructivist Perspectives	his paper investigates how ESD is recontextualised in pedagogic practice in geography teaching in Hanoi, Vietnam, with the case study in two schools.	Bernstein's Sociological Theory of Education (1973-1996)	Empirical materials for this study include video recordings and observations of 15 geography lessons conducted between 2016 and 2019. The lessons were selected based on the areas where the teachers thought they would be promoting ESD.	The observed pedagogic practice demonstrates a performance-based model of pedagogy, in contrast to a constructivist approach, which the tenets of ESD call for. aken as a whole, the observed pedagogic practice reflects the influence of the power relations inherited from cultural values on a strong classification and framing pedagogic practice. This demonstrates the limitations of the high global ambitions of ESD principles.	1, 2, 5

From “education for sustainable development” to “education for the end of the world as we know it”	This article addresses the limitations of sustainable development as an orienting educational horizon of hope and change, given that mainstream development presumes the possibility of perpetual growth and consumption on a finite planet.	decolonial and Indigenous analytical practices	Critical analysis	The article contends that the predicament we face is not primarily rooted in ignorance and thus solvable with more knowledge, nor primarily rooted in immorality and thus solvable with more normative values; rather, it is rooted in denials that stem from harmful desires for and investments in the continuity of the securities and satisfactions promised by modernity-coloniality.	3, 5
Caribbean Dreams: Education for More than "Just" Sustainable Development	Education has the potential to help address some of the most critical social and environmental issues of the Caribbean. However, I argue that this can only occur if there is a radical critique of the now dominant education for sustainable development (ESD) discourse, which is seemingly constructed primarily from the positionality and interests of the global powerful. I	Repositioning theory	Critical analysis	Specifically related to the Caribbean, education for sustainable development is inappropriate because it implicitly seeks to continue a system of exploitation of people and the environment due to its advocacy of a type of education designed to perpetuate a particular form of modernist capitalist development.	3, 5
'We Must Urgently Learn to Live Differently': The Biopolitics of "ESD for 2030"	This paper explores biopolitical elements in ESD for 2030	Foucauldian theory, biopolitics	Critical analysis	The findings point to a biopolitical differentiation where rich and poor populations are assumed to need different educational interventions, adapted to their socio-economic contexts, in the global educational policy quest for sustainable development.	2, 3, 5
What's in a Name? The Signifiers and Empty Signifiers of Environmental Sustainability Education: Implications for Teacher Education	The purpose of this article is to examine how signifiers and empty signifiers may contribute to the mainstreaming of environmental and sustainability education in teacher education.	Philosophical inquiry	A philosophical inquiry, augmented by a modified form of semiotic analysis,	the article argues that the moniker of environmental and sustainability education is an empty signifier in that it fails to convey meaning about what it signifies.	1, 5
An Ecopedagogical, Ecolinguistical Reading of the Sustainable Development Goals (SDGs): What We Have Learned from Paulo Freire	This article discusses Paulo Freire’s global influences on environmental pedagogies and argue that ecopedagogical reinventions are essential for ‘quality’ education, as touted in the United Nations Sustainable Development Goal (SDG) #4, for global, all-inclusive ‘development’ that is planetarily sustainable. The politics of how ‘development’ is taught or not taught to be critically read linguistically and dialogically will be problematized through Freire’s work, and reinventions of his work, on ecopedagogy.	Frierean lens	Critical analysis	Achieving the SDGs must be holistically taught rather than siloed, including #4. Key to socio-environmental justice and planetary sustainability is recognizing there is no single, simple solution – environmental ills are wicked problems. Although the SDGs and work on the SDGs has problematic language, including that of the ‘Big Five’ who are agents of them, the 17 goals’ diversity indicates sustainable development complexities.	1, 3, 4, 5

Empowering Political Engagement with Unsustainable Actions: The Possibilities and Limitations of Teaching Guides for Climate Change Education	How are the problems and underlying assumptions of unsustainable actions represented through the CCE guides prescriptions, including those for cognitive, socio-emotional and behavioral/action-competence learning? How do these problems constitute students as 'sustainable citizens', particularly concerning their roles and responsibilities for change? What blind-spots are created?	what's the problem represented to be?' approach	Critical analysis of ESD guides	The study argues that the emphasis of these guides is on the symptoms (unsustainable choices of behavior) rather than the systemic causes (unsustainable modes of organization).	1, 3, 4, 5
Facilitating Democratic Processes for Sustainability: The Possibilities and Limitations of Teaching Guides for Climate Change Education	Education for Sustainable Development (ESD) stresses the importance of building teachers' capacity for an ESD transforming how people think and act. From the perspective of the pluralistic tradition, this creates challenges related to this tradition's notion that educators should facilitate open-ended democratic education processes. This study examines these challenges	'What's the problem represented to be? approach.	Critical policy analysis	The study shows particular possibilities and limitations that different problematizations of the unity-disunity tension,	1, 5
Representations of Humans, Climate Change, and Environmental Degradation in School Textbooks in Ghana and Malawi	he interest in education for sustainable development (ESD) to support African youth in learning about and adapting to climate change is growing in response. This study examines the messages about human-earth relationships, environmental change, and responsibilities for mitigation that are presented in official grade 8 Ghana and Malawi textbooks.	Political ecology framework,	Text analysis	The curricula normalize an anthropocentric earth view that disappears global power dynamic, neglects widespread commodification of scarce resources, fails to question the developmentalist dream of endless growth, and translates local ecological contexts into universal commodities.	2, 3, 4, 5
The Holocene Simulacrum	identify the implications of ESD's mainstay commitments, particularly as expressed in the field's lingering fidelities to anthropocentric production and modes of protagonistic optimism.	Thinking of Jean Baudrillard	Critical analysis	Education for Sustainable Development (ESD) is a broad and varied field of study replete with compelling advocacies for a more humane world. Across a majority of its instances however, ESD might yet be seen to labour in stealth fidelity to a mode of political economy and model of human-nature relations complicit with planetary ecocide.	1, 3, 4, 5
Sustainable Learning and Some Counterculture Values in Jamaica: A Rastafarian Spiritual Ethos to ESD	he research study explored the interaction between local knowledge, values and practices and dominant Western approaches to education for sustainable development (ESD).	Not clear	Ethnographic doctoral study on ESD in a Jamaican school and community	The ESD paradigm needs to reflect the fact that its perpetuation of neo-liberal values and practices based on market-oriented thinking and consumeristic action no longer fits the urgent needs of either the Global north or South. learning to redirect current unsustainable patterns towards more sustainable ones locally cannot be isolated from the need to re-envision the nature of the unsustainable relationships between the Global north and South at the international level.	1, 2, 3, 4, 5

Perceived interest in learning sustainability competencies among higher education students	This study explores higher education students' interest in learning sustainability competencies and their pro-ecological worldviews.	Not clear.	797 students participated in the study. The data were collected through an online survey	The research has also shown that participating students' interest in learning sustainability competencies is connected to their pro-ecological worldviews, fields of study and their previous study and work experience related to sustainability.	1, 5
Research Approaches in ESD/ESE: Reflections of Swiss Researchers	This paper reflects on research approaches that are particularly suitable for the ESD/ESE objects.	Research paradigms	Literature analysis	raming is crucial to challenge the underlying paradigms in our societies, mixed methods are a necessity to address the complexity that characterises the implementation of ESD in schools, and participatory components are particularly coherent to foster an articulation between academic and practical epistemologies.	1, 5
Classical paradigms versus complexity thinking in engineering education: an essential discussion in the education for sustainable development	This paper aims to discuss how the theory of complex thinking can be considered an interesting element in engineering education, especially in the context in which challenges toward sustainable development are multidisciplinary.	Not clear.	This viewpoint synthesizes the main reflections and discussions generated during a process of debate, research and creation of a proposal for an undergraduate engineering course at a higher education institution in Brazil. The literature on engineering education, sustainability and complexity was considered in an integrated way.	Incorporating complex thinking into engineering education is critical for enabling engineers to articulate different concepts, disciplines and areas of knowledge so that they are capable to understand the effects of their actions on the world and the importance of their role in facing the challenges of sustainability.	1, 5
Discovering Earth and the Missing Masses--Technologically Informed Education for a Post-Sustainable Future	The study presents a thought experiment adopting the perspective of Earth-settlers, aiming to illuminate the planetary mass of technology.	Hannah Arendt's notion of 'earth alienation' and Bruno Latour's notion of technology as 'missing mass'	Critical analysis	In the current Anthropocene era, our relation to technology should be a crucial theme of CCE and EE. It further suspects that sustainable development (SD) and the education promoting it (ESD) are problematic, because the green growth proposed is inextricably linked to the unattainable goal of decoupling growth from environmental impact.	1, 3, 4