What's In a Name? The Signifiers and Empty Signifiers of Environmental Sustainability Education: Implications for Teacher Education

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Abstract

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. We argue that the moniker of environmental and sustainability education is an empty signifier in that it fails to convey meaning about what it signifies. Tracing the history of the pre-sustainability, sustainability, and post-sustainability field signifiers, and their respective sub-field signifiers (e.g., environmental education and education for sustainable development), we conduct a philosophical inquiry, augmented by a modified form of semiotic analysis, to expose the degree to which these signifiers are empty. The limitations and benefits of empty signification are explored through philosophical interpretation. Implications of empty signifier limitations are considered in teacher education and the manner in which they may contribute to the unsuccessful mainstreaming of environmental and sustainability education in teacher education. We conclude that a core or compulsory environmental and sustainability education course should be mandated in teacher education to ensure that all teacher candidates receive the education they require to educate future generations of children to live well on Earth.

Keywords: environmental and sustainability education, teacher education, signifiers, empty signifiers, philosophic inquiry, semiotic analysis, programming approaches

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The purpose of this conceptual paper is to examine why environmental and sustainability education (ESE)[1] employs a diversity of names (signifiers) when referring to itself (e.g., environmental education, education for sustainable development, education for sustainability, etc.), in contrast to other fields of study such as science education that employs a singular name to describe its field (i.e., science education). Whereas singular names remain relatively stable over time, the names for ESE change and diversify with time, reflecting current worldviews as orientations toward nature, political ideology, ethics, and aims of education. Acceptance for diversity of names in a given field is referred to as *pluralism*.

The answer to the leading question in our title "What's In a Name?" and its significance to ESE is deceivingly complex. What's more, it has received little to no critical attention or analysis in teacher education. Furthermore, its effect on mainstreaming in teacher education is unknown.

In response to this question, our paper is organized as follows. In Part I, we provide a statement of the research problem, identifying the problem and the objective of this inquiry. We then problematize it in relation to the larger challenge of mainstreaming[2] ESE in Canadian teacher education.[3] We conclude by summarizing our inquiry questions and outlining our methodology: philosophical inquiry augmented by semiotic analysis. In Part II, we provide a brief historical overview of the field of ESE, identifying major signifying fields and sub-fields and portray how these developed as expressions of distinct worldviews. This sets the stage in Part III, to conduct a semiotic analysis of ESE signifiers exposing their limitations and benefits. Lastly, in Part IV, we examine the balance sheet of the limitations and benefits of empty signifiers, and their implications for mainstreaming in teacher education, highlighting several conclusions.

Part I: Statement of the Research Problem and Methodology

Purpose

There are a variety of signifiers used to describe ESE, a type of education that concerns itself with the natural environment and humankind's relationship with it. A signifier is an image or sound that points to or signifies an idea or concept (de Saussure, 1916/1983). ESE is one

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[1] Environmental and sustainability education (ESE) is a term commonly used in Canada and in some other countries. It serves as a linguistic placeholder for our analysis. Any of the numerous competing terms (such as "environmental education" or "education for sustainable development") could have been used as our starting point. ESE is a sub-field of the larger field of "sustainability."

[2] Our use of the term "mainstreaming" is defined as the programming of the field of studies that secures its status as a mandatory subject that all teacher candidates are required to take as part of their certification and faculties of education are required to provide as part of their accreditation by professional bodies.

[3] Our focus is on the Canadian teacher education context. Any conclusions we make are limited to this context but may well be extended to international contexts.

signifier and this list of signifiers has broadened and diversified in recent decades as the relationship between humans and their environment has extended to a consideration of the social relationships between humans and how the environmental challenges we face are magnified with inequities between various groups of humans, because of race, class, ethnicity, culture, gender, sexual orientation, age, and dis/ability. The list of signifiers continues to grow. Some argue that in addition to the environmental and social relationships on which education should focus, the field should also consider an ontological dimension—as the nature of human being predicates our social and environmental relationships (Jickling & Sterling, 2017). While not exhaustive, a list of signifiers reflecting the range and diversity of environmental, social, and ontological inter-relationships could include: *rural education*, *conservation education*, *environmental education*, *outdoor education*, *experiential education*, *education for sustainable development* and its variants (e.g., *sustainability education*), *place-based education*, *climate change education*, *land-based education*, *resiliency education*, and *immanence education*, to name a few. Other fields of study do not exhibit such diversity of names. Consider science education for instance; it is simply named "science education." The field is clearly defined and bounded. The community of science education scholars are relatively united in purpose under the signifier we use to refer to this field. In contrast, for those of us who are scholars in the field of ESE, we are faced with a plurality of signifiers. This state of affairs is perplexing to anyone outside of this field.

Problem

Despite the ongoing efforts of dedicated, passionate, and persevering ESE scholars, ESE and its variants continue to face challenges moving from the margins to the mainstream in Canadian and international faculties of education (Kool et al., 2021; Lin, 2002; Steele, 2010; Swayze et al., 2012; Towler, 1980). This problem is not unique to Canada. In a recent international scoping literature review on ESE in teacher education, the global nature of the problem becomes apparent as different countries adopt different signifiers (Karrow & Docherty-Skippen, 2022). For example, the United States prefers the signifiers "environmental education" and "ecojustice education" whereas Canada and Australia commonly use "environmental and sustainability education." These are oversimplifications to illustrate that diverse signifiers are used globally.

There are many challenges to mainstreaming ESE in teacher education (Evans et al., 2017; Ferreira et al., 2009; Gough, 2016; Inwood & Jagger, 2014; Steele, 2010). These have been well-researched and documented in Canada and internationally (Evans et al., 2017; Ferreira et al., 2009; Gough, 2016; Kool et al., 2021; Steele, 2010). Our intent is neither to rehash these challenges nor reiterate specific solutions. Rather, we wonder about the implications the diversity of signifiers may have on the mainstreaming of ESE in teacher education.

Question(s)

Beyond teacher education, the plurality of signifiers and challenges they pose have been intimated by others in the broader field of ESE (Brown, 2015; González–Gaudiano, 2005; Jickling & Sterling, 2017; Laclau, 1996). Given what tends to happen in the larger field of ESE transcends teacher education, our research questions below are particularly relevant to our collective activities within teacher education. The ongoing challenges we all face mainstreaming ESE in teacher education, driven by our mutual concern for the future of our Earth and the education of its citizenry, require us to examine the field's tendencies for pluralism more critically. This leads us to pose the following two questions:

1. What are the benefits and limitations of ESE's signification in teacher education?
2. What implications may this have for teacher education and its mainstreaming in faculties of education?

Methodological Approach: Philosophical Inquiry and Semiotic Analysis

The answers to our questions are explored through philosophical inquiry supplemented by a modified form of semiotic analysis. Philosophical inquiry is used because our research questions are philosophical in nature. Our questions critically examine the assumptions and logic behind ESE signifiers and the implications these may have for teacher education and its mainstreaming in faculties of education. Because philosophical inquiry is premised upon language and semiotic analysis that uncovers the meaning of words comprising language, semiotic analysis can supplement our philosophical inquiry. Western philosophy has recognized the importance of semiotics through much of its history (Manetti, 1987/1993).

In our inquiry, we follow the agreed upon and essential characteristics of philosophical inquiry, in that it: (a) is a reflective and/or a meditative activity; (b) seeks clarification and understanding rather than binding axioms and truths; (c) takes as its starting point the language used to describe and explain different aspects of experience; and (d) achieves its goals by challenging underlying assumptions (Stubley, 1992). Specifically, philosophical inquiry enables us to argue that ESE is an empty signifier. As will be revealed through our simplified semiotic analysis, ESE's meaning is "meaningless." This follows with implications of ESE's empty signification for teacher education and its mainstreaming in faculties of education.

Semiotics is the "study of signs and symbols, specifically their relations between written or spoken ideas and their referents in the physical world or the world of ideas" (Hanks, 1986, p. 1389). Generally, a sign consists of a signifier and what is signified. A signifier is the sound or image associated with something and the signified is the idea or concept of the thing. A sign combines the signifier and the signified into a meaningful unit (Barthes, 1968) (Figure 1). It should be acknowledged that signs and the relationship between signifier and signified is based

on convention—it is arbitrary. Also, these signs do not operate independently or in isolation; and the way we make sense of the world is through our social milieu (de Saussure, 1916/1983). Referring to Figure 1, the STOP sign combines its signifier (the word "STOP) and its signification (to "cease movement") into a meaningful unit in this way: We see the STOP sign, perceive and comprehend its message, and act by ceasing movement.

Figure 1

Semiotics: Relationship Between Sign, Signifier, and Signified

$$\text{Sign} = \frac{\text{signifier (“STOP”)}}{\text{signified (cease movement)}}$$
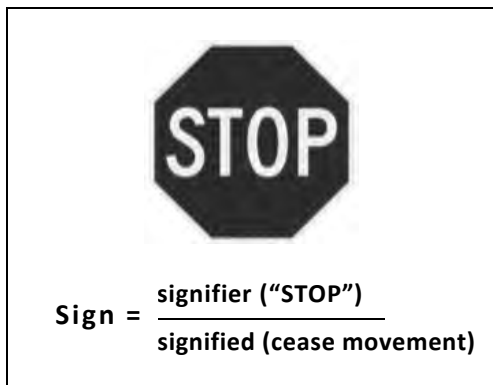
We delve into a very basic form of semiotic analysis, uncovering the "meaning of signs," revealing the degree to which ESE is an empty signifier, problematizing it for consideration in a discussion about mainstreaming ESE in teacher education. An *empty signifier* is a word that does not convey meaning, for a variety of reasons as we shall see (Brown, 2015; Laclau, 1996). To use our STOP sign as an example, the signifier (the word "STOP") no longer has signification ("ceasing movement") and cannot be understood, possibly resulting in someone driving through an intersection when they should have "stopped" (notwithstanding other scenarios). In the case with ESE, it means that the ESE signifier, for various reasons, isn't signified, because there is no longer a connection between the ESE signifier and what it signifies. Thus, the meaning is unclear.

Historically, there have been three approaches or systems to conceptualizing the signifier/signified relationship. We adopt Ferdinand de Saussure's (1916/1983) classical system in our application of the meaning of signs. According to de Saussure, semiotics is concerned with signs and their objects and meaning. Of the common semiotic concepts, we adopt two— *signifier/signified* and *paradigmatic analysis*—to facilitate our examination of the ESE signifiers in teacher education (Berger, 1982). The signifier/signified semiotic concept has been previously introduced (Figure 1). The second semiotic concept, paradigmatic analysis (Berger, 1982), is also particularly useful for our purposes. Paradigmatic analysis of a text involves the search for meaning through binary or polar oppositions nested within language. As explained

by Berger (1982): "Such meaning is based on the establishment of relationship, and the most important kind of relationship in the production of meaning in language is that of opposition" (p. 24). In our examination of the various ESE signifiers, underlying these are meanings often structured through oppositions within the language. As an example, paradigmatic analysis of the pre-sustainability and sustainability fields (Table 1) will reveal that each field has a distinct worldview. Respectively, these are: modern versus postmodern worldviews. The ESE signifier reflects a worldview, in response to a binary opposition nested within an orientation to nature (realism vs. humanism), political ideology (conservativism vs. liberalism), ethics (environmental justice vs. socio-ecological justice), and aims of education (instrumentalism vs. transformationalism)[4] (Karrow et al., 2022).

In the next section, we provide a brief historical overview of the field of ESE and its sub-fields to orient the reader to: (a) the history of the field and sub-field signifiers (their developments, evolution, and relationships); (b) the larger social-political-educational contexts in which they operate and their unique understandings of the world (worldview); and (c) the assumptions that underpin these worldviews, as expressed through dichotomous views on nature, political ideology, ethics, and aim of education. This sets the stage for our analysis in Part III.

Part II: Historical Overview of Field and Sub-field ESE Signifiers

The field signifiers—*pre-sustainability*, *sustainability*, and *post-sustainability*—are widely recognized as reflecting the history and evolution of the field (Jickling & Sterling, 2017; Karrow et al., 2022; Palmer-Cooper, 1998). We have also indicated some of the sub-field signifiers that each field signifier has spawned. Sub-field signifiers share common worldviews and are diverse expressions of the general field signifier. For instance, under the pre-sustainability field signifier are the sub-field signifiers of environmental education, experiential education, and outdoor education, to name a few (Table 1). There is a temporal relationship between the field signifiers, with one generally changing to the next. However, many of the signifiers have been adopted for use throughout the world in various ways (e.g., some countries in the world adopt one or more signifiers; other countries other signifiers; some countries embrace the plurality of signifiers). Recognizing the major field signifiers, sub-field signifiers, and their temporal relationships sets the stage for further analysis in Part III.

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[4] The authors acknowledge the simplified form of paradigmatic analysis employed in this manuscript is part of a more complex semiotic method known as the Greimas square, where other relationships in addition to the "contrary" (e.g., contradictory and implication) are anticipated (Greimas, 1983).

Table 1

Pre-Sustainability, Sustainability, and Post-Sustainability Field/Sub-Field Signifiers and Worldview

Elements of worldview	Field/sub-field signifiers and worldview timeline[1]		
	1970s	1990s	Present-Future
	Pre-sustainability field	Sustainability field	Post-sustainability field
	• Sub-fields: Environmental education, experiential education, outdoor education, and derivatives (e.g., outdoor adventure education).	• Sub-fields: Education for sustainable development and variants (e.g., *environmental and sustainability education*[2]), sustainability education, ecojustice education, place-based education, land-based education, climate change education.	• Sub-fields: Resilience education, wild pedagogies, immanence education.
	Modern	Postmodern	Post-postmodern
– Orientation to nature	Realism (object)	Humanism (subject)	Post-humanism (subject/object)
– Political ideology	Conservatism	Liberalism	Deep-ecology environmentalism
– Ethics	Environmental justice	Socio-ecological justice	Interspecies justice
– Aim of education	Instrumentalism (environmental problem-solving)	Transformationalism (social-ecological equity)	Revisionism (revisioning education)

Notes. This temporal table demonstrates ESE's field/sub-field signifiers and worldviews.

[1] The timeline for the three field signifiers is approximate. The post-postmodern field continues to characterize its signifiers.

[2] Environmental and sustainability education has been italicized to highlight its popularity in Canada. It acts as a linguistic placeholder to conduct our inquiry.

Pre-Sustainability Field Signifier

The 1970s represent a seminal decade in the global recognition of the pre-sustainability signifier as several important international institutions collectively raised the profile of the field and paved the way for a common understanding of its aims, objectives, and approaches. It has spawned a variety of sub-field signifiers including environmental education, outdoor education and its variants (e.g., outdoor adventure education). It is a by-product of the modern worldview, underpinned by the following assumptions: realism or an orientation toward nature as object-oriented; a conservative political ideology motivated toward homogenization of power; an ethics directed to environmental justice; and an aim of education tending toward problem-solving, instrumentally configured. In essence, the modern worldview's pre-sustainability signifier (and sub-field signifiers) are concerned with solving environmental problems.

Sustainability Field Signifier

The sustainability field signifier transformed academic and pragmatic discourses in the field through its definition: development that meets the needs of the present population without compromising the ability of future generations of people to meet their own needs.[5] Of the three field signifiers it has spawned the most sub-field signifiers, including but not limited to: education for sustainable development and its variants (e.g., sustainability education, education for sustainability); place-based education, land-based education, climate change education, and so on. Adopting a postmodern worldview, the sustainability field signifier is underpinned by the following assumptions: humanism or an orientation toward nature as subject-oriented, a political ideology of liberalism decentralizing power, an ethic committing to socio-ecological-justice, and an aim of education directed to transforming power through social and individual transformation. Essentially, the sustainability field signifier is also concerned about solving environmental problems. However, it recognizes that the social inequities we face as human beings are co-implicated with the environmental challenges we face. Transforming society by addressing the political, social, economic, ethical, and educational inequities will result, too, in addressing our environmental precarity. The ESE signifier, for reasons previously given, will be the signifier considered for analysis and argument development in Part III.

Post-Sustainability Field Signifier

The post-sustainability field signifier is currently defining itself. A variety of sub-field signifiers are currently being entertained, including: resilience education (González-Gaudiano &

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[5] See the World Commission on Environment and Development's 1987 report titled *Our Common Future* (later known as the Brundtland Report): https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf

Gutiérrez-Pérez, 2017), wild pedagogies (Jickling et al., 2018), and immanence education (Le Grange, 2017). Its worldview is more post-postmodern, underpinned by assumptions reflecting a post-humanist orientation to nature (reflective of the subject/object relationship), a political ideology supported by deep-ecology (de-centering human power), an ethic oriented to interspecies justice (all species have value), and an aim of education that is revisionist— questioning historical aims of education directed toward instrumentalism and transformationalism, while re-imagining something grander: what education could become. For instance, some of its sub-field signifiers like resilience education claim the purpose of education should be to educate the next generation toward "hope," "compassion," and "self-regulation," all in an attempt to "adapt" to the rampant "perplexity" and "uncertainty" in the world (González-Gaudiano & Guitiérrez-Pérez, 2017, p. 125). While there are other sub-fields with their unique differences, they share a common tendency to claim education can reimagine a world where humans adapt to radically changing and uncertain circumstances.

Part III: Philosophical Inquiry and Semiotic Analysis

Semiotic Concepts: Signified/Signifier and Paradigmatic Analysis

An examination of the ESE signifier commences in this section, in terms of the signifier/signified concept uniquely recognized in field of semiotics and its paradigmatic analysis. The following argument is put forth: That while the ESE signifier attempts to project meaning, it fails to adequately define itself as a clearly bounded disciplinary field. As a result, the ESE signifier is empty. One might assume, this is all bad news. However, as we attempt to illustrate toward the end of this section, this sets the stage for a philosophical examination of the limitations *and* benefits of an empty ESE signifier.

The ESE signifier is a hybrid signs of sorts. It is an attempt to blend the pre-sustainability and sustainability field signifiers. However, it does this with mixed results. The most "desirable" feature of each field signifier has been adopted; the "least desirable" feature has been eliminated or diminished. The most desirable features of the two field signifiers— "environmental" and "sustainability"—have been conjoined with "education" while distancing themselves from any association with "development." This begs the question: What is being signified? "Environment" is certainly the first signified concept and "sustainability" is the second signified concept. There is an attempt for the word "environment" to signify a field of studies that concerns itself with a focus on the environment from the standpoint of the second signifier, "sustainability"—oversimplistically, living today in a way that allows living for tomorrow. Consequently, we end up with a field of studies that is concerned with aspects of sustainability from an environmental perspective. In short, for various political reasons there is an overt attempt to admonish any association or affiliation with "development" (the economic pillar of sustainability) while highlighting "environment" (the "natural" pillar of sustainability). In

our experience as ESE teacher education scholars, there has certainly been a bias toward the environmental dimension, while downplaying the economic and social dimensions through strict avoidance of the signifier, "development." We should be circumspect as to why there is a need to highlight environment over the "political" and "social" pillars of sustainability when all four are recognized within the definition of sustainability according to UNESCO (2015). Nonetheless, the ESE signifier attempts to borrow what it views as the most desirable features of the past while recombining them in a way that better anticipates the future. The point is that through the continual naming, renaming, recombining exercise, some former concepts are lost or eroded while other new concepts may be gained. That is the beauty of language. However, on its surface this may also be a liability in a teacher education context. Before we examine this context, there are other reasons for concern about the ESE signifier's integrity and its ability to convey meaning.

Turning our attention to the second semiotic concept of paradigmatic analysis reveals further complexities. Recall Table 1; these signifiers and associated worldviews are relatively coherent within the original field signifiers. However, hybridization of the ESE signifier does not neatly translate into a hybridized worldview. A pre-sustainability modern worldview with a sustainability postmodern worldview is contrary. Its contrariness becomes obvious when we examine its orientations to nature, politics, ethics, and education. The making up of new signifiers fails to consider that worldviews are premised on complex ontological, epistemological, and axiological assumptions. Put bluntly, worldviews are not commensurable— they should not be hybridized in the way a field signifier can be spliced and recombined into something new, such as "ESE." Specifically, the pre-sustainability and sustainability field signifiers exhibit divergent orientations towards nature, with the former adopting a realist view of nature (nature is out there and the best we can do is try to understand it) and the latter adopting a humanist view of nature (humans will eventually discover the truth about nature). Further divergencies occur with political ideology. Pre-sustainability tends to orient toward conservatism while sustainability orients more toward liberalism. Ethically, pre-sustainability tends toward environmental justice in contrast to sustainability with its emphasis on social-ecological justice. The aim of education for pre-sustainability is primarily directed toward problem-solving and as such assumes an instrumentalist function, whereas with sustainability, the aim of education is directed toward social-ecological transformation of power relations to achieve socio-ecological equity. Summarizing, the hybridized ESE signifier, through its deliberate efforts to include and exclude certain conceptual dimensions (environment, economy, and society), attempts to incorporate modern and post-modern worldviews. The orientations to nature, political ideology, ethics, and aims of education are significantly divergent and inhibit mutual inclusion of the original field signifiers. On one level, the ESE

signifier as a hybridized signifier fails to fully signify the original concepts of the field signifiers. As adaptations or modifications of the original, its meaning(s) may be unclear or diffuse.

The ESE signifier and what it attempts to signify is eroded in other ways, through its "totalizing" and "diffusing" precocities. In certain circumstances the ESE signifier "totalizes" signification over other signifiers (it stands in for all other signifiers). And second, if the phenomenon of "totalizing" doesn't occur, because of the diversity of signifiers at play and the degree to which each has traction, what is actually signified becomes difficult to discriminate and becomes lost in the shuffle of competing signifiers (e.g., place-based education, land-based education, ecojustice education, etc.). On the other hand, if the ESE signifier's meaning is generalized throughout the mass of competing signifiers (its signification is adopted in a general sense by other signifiers), then it becomes difficult to discriminate all the signifiers at play, each jostling for recognition and legitimacy (which is the current state of affairs in the sustainability field and quite possibility the post-sustainability field). In summary, through a signifier's totalizing and diffusing functions, it can be further eroded.

The ESE signifier fails to delimit the boundaries of its concepts (what is signified), for the reasons previously cited. When it reaches this state, according to Brown (2015) and Laclau (1996) it becomes fractured or impaired, and its signification becomes eroded. It becomes an empty signifier. This is the status of the ESE signifier; however, we could have argued the same with any of the other sub-field signifiers currently in popular use (see Table 1).

Limitations and Benefits of Empty Signification

Limitations

Empty signifiers are contingently articulated within the empty place they occupy, meaning they remain meaningless or are chameleon-like in their ability to adopt meaning depending on their context. Such a condition suggests their meaning will "always be transitory and subject to permanent questioning (González-Gaudiano, 2005, p. 245). This leaves us in the untenable position of "coin[ing] new neologisms … to overcome deficiencies and inertia … which cause processes of 'change so that nothing changes'" (González-Gaudiano, 2005, p. 247). González-Gaudiano is suggesting that through our desire to invent new signifiers, in response to our dissatisfaction with traditional signifiers, change for change's sake and not conceptual change predominates. Jickling and Sterling (2017) sum this up nicely by adding: "Are we just going to continue replacing one empty signifier with another?" (p. 4). In fact, we observe that this is exactly what has occurred. While it may be true in some instances that one signifier has been replaced with another, a survey of the sustainability field signifier and its many sub-field signifiers (Table 1) illustrates that many scholars are content to add additional signifiers to the growing list of signifiers (Jickling & Sterling, 2017; Le Grange, 2017). This reflects the pluralistic

nature of this paradigm with its shift to a humanist orientation toward nature from a realist orientation toward nature, all the while attending to the political, ethical, and educational implications this has for human beings' expressions of politicized identity.

Benefits

We have been making the case that ESE is an empty signifier. Empty signification is a symptom of pluralism, which characterizes the state of affairs during the history of field signifiers (Table 1), with field signifiers spawning many sub-field signifiers. Some theorists argue that the very limitations we've identified are beneficial in some cases. Le Grange (2017), for instance, examines the consequences of an empty signifier, adding that an empty signifier "is not a word without meaning but concerns the possibility of *signifying the limits of signification itself*" (p. 98; our emphasis). When two or more sub-fields employ different signifiers, empty signifiers "stand in the gap" (Brown, 2015, p. 124). Fields or sub-fields may be antagonistic when a particular system of signification cannot incorporate them. In other words, "an empty signifier holds what a particular discourse [field/sub-field] excludes, what a signification system cannot incorporate" (Le Grange, 2017, p. 99). Using the ESE signifier as an example, because it attempts to hybridize "environment" (environmental education) with "sustainability" (education for sustainable development) as we previously argued, it erodes or empties the original concepts. However, as Laclau (1996) and Brown (2015) point out, there may be some utility to this approach when examined retrospectively. While each part of the original signifier (environmental + sustainability) may be eroded or empty, the ESE signifier "holds each of these antagonistic discourses [fields/sub-fields] because each of these discourses was unable to incorporate the other" (Le Grange, 2017, p. 99). Although we argued these "antagonistic" or contrary discourses are incommensurable, Brown (2015), Le Grange (2017), and Laclau (1996) recognize their utility.

A useful metaphor to help us think about how an empty signifier might be beneficial is the geographical feature of the archipelago (a land mass of aggregated islands). Imagine the country of Japan with its disaggregated islands, each of which has a name or jurisdiction. If we map onto Japan's various islands the diversity of ESE signifiers, each assumes an identity. These "identities" are interrelated in various ways and degrees, even to the point of being disconnected (disperse) as a systemic set (González-Gaudiano, 2005, p. 245). The islands of Japan illustrate, metaphorically, the dispersion, diversity, and multiplicity of signifiers, to which Lyotard (1988) refers to as "discourse configurations," a concept which explains the nature of the relationships among a constellation of elements. As Japan's islands, inscribed with a different ESE signifier (e.g., environmental education, education for sustainable development, place-based education, land-based education, ecojustice education, etc.), each assume relatively autonomous identities of the overall discourse configuration (the sustainability field

signifier) they may become antagonistic and exclusive (Buenfil, 2003). González–Gaudiano (2005) refers to this antagonism and exclusivity as a "chain of equivalencies," adding: "The chain of equivalencies around a common core of dissension with the status quo paradoxically weakens individual differential identities, and a hint of universality and legitimacy is introduced" (p. 245).

Furthermore, Beunfil (2003) views this "chain of equivalencies" as a benefit, in the sense that they

> open the way, create a new space, a name, reaffirm their existence, push themselves to the limit, challenge those who reject the field and form alliances with those who support it from opposing positions to us, seeking academic–political articulations that strengthen it. (p. 84; Google Translate)

Continuing, Beunfil (2003) extols the benefits of empty signification on methodological grounds as they "involve dispersed, fragmented methods, sometimes for survival and other times Indigenous, outstanding improvisations" (p. 85). He argues these opportunities allow us to consider "old arguments" and to "incorporate new approaches and review our attitudes" toward signifiers. This can provide us with the opportunity to consider respective pedagogical meanings while providing the impetus to invigorate, through the "chain of equivalencies" (e.g., the islands of Japan are united through their disunity with the status quo, which weakens their individuality and strengthens their legitimacy through a common identity), additional signifiers. The denial of any field or sub-field through the resulting antagonisms between their signifiers provides new opportunities for new fields/sub-fields to be developed for the future.

The balance sheet of limitations versus benefits seems weighted in favour of the latter. However, it isn't simply a matter of tallying up figures in columns. Purpose and context are important. We concede that empty signifiers are "methodologically" advantageous (they can help us create new concepts and signifiers), however this isn't our concern. In the field of ESE writ large, theorists need intellectual apparatus to advance the field. In teacher education, we simply need a recognizable field of study, a discipline with which a teachable subject can be identified and recognized so that teacher can be adequately educated and certified to teach the next generation of children how to live with other humans, species, and the Earth itself. So, we return to the limitations we previously identified and examine them in the context of teacher education. Our analysis of the erosion of the ESE signifier demonstrates why ESE in teacher education may be facing another challenge getting traction within teacher education: Without a signifier that points to some mutually agreed upon concept(s), what it signifies becomes unclear and confusing. In practical terms, if the ESE signifier is empty, how can it gain a foothold in teacher education?

Part IV: Implications for Teacher Education and Mainstreaming in Faculties of Education

The argument we have been making to this point has been inspired by our provincial context, the province of Ontario. This context, and the collective experiences derived therein, motivate us to offer up this argument for consideration to Canadian and international audiences. And while we recognize the tendency to generalize is problematic, for many reasons (this is not an empirical study), we are confident our argument may be of interest and relevance to various teacher education settings (e.g., provincial/territorial, Canada, and international) as the problematic nature of ESE's signification outside teacher education has been recognized internationally (Jickling & Sperling, 2017; Kopnina, 2012, 2014; Le Grange, 2017). We end this section by drawing some conclusions within the Ontario context and invite the reader to consider these conclusions in their respective (Canadian or international) contexts.

Teacher education in the province of Ontario tends to structure programming around traditional subjects (e.g., science, mathematics, social studies, the arts, and physical education) as a direct response to the manner in which such subjects are organized and taught in PK–12 schools. Teacher education concomitantly offers programming to prepare teachers to teach these subjects as they are defined and recognized within Ontario Ministry of Education (OME) policy and regulation. Accordingly, accreditation bodies (e.g., Ontario College of Teachers [OCT], various Ministries of Education) accredit faculties of education that closely follow accreditation regulations. In the province of Ontario, while ESE is *recommended* as part of teacher certification (OCT, n.d.), there is nothing in the policy to ensure faculties of education are accrediting teachers to be qualified to teach ESE. Furthermore, and surprisingly, the OME policy *does* require ESE to be taught in PK–12 schools (OME, 2009, 2017). However, the programming, certification and accreditation alignment between teacher education programs and PK–12 schools is not carefully coordinated with regard to ESE.

Further exacerbating this challenge, in a condensed and limited curricular timetable within teacher education, empty signification is problematic because the ESE signifier becomes fractured with its various signifiers competing against one another (e.g., some faculties of education use the signifier environmental education; others use climate change, outdoor education, education for sustainable development, and so on). As we have argued, because ESE lacks a clear and consistent signifier, it lacks conceptual clarity and boundedness. This puts it immediately at a disadvantage in teacher education because it lacks subject "identity" in a PK–12 school setting where curricula are structured according to "subjects." In concrete terms, ESE is not a "teachable subject."[6]

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[6] "Teachable subject" is the colloquial term referring to the requirement by a Ministry of Education and/or certifying/credentialing body (e.g., college of education or equivalent) for a teacher education program to prepare future teachers to teach a specific curricular area (e.g., science, mathematics, language arts).

This challenge persists in the province of Ontario despite being one of the few provinces/territories in Canada that has curricular policy requiring ESE to be taught in PK–12 schools (Karrow & DiGiuseppe, 2019b). As such, because of the signifier problem, ESE struggles to get consistent traction within teacher education.[7] And, rather than enjoying the same subject status as science education, for instance, its precarious status is left to dedicated ESE teacher education scholars to resuscitate (Evans et al., 2017; Ferreira et al., 2009; Gough, 2016; Inwood & Jagger, 2014; Steele, 2010).

In the larger Canadian context, most provinces/territories are also at a disadvantage, particularly as most (exceptions noted: Manitoba and British Columbia) do not even have ESE Ministry of Education policy. Given the precarious and haphazard manner ESE occurs in Canadian teacher education (Karrow & DiGiuseppe, 2019a) and given the urgent need to educate future teachers and their students to live in a world that is undergoing rapid environmental and social change and the great inequities this presents, there is a desperate need for ESE in teacher education to be part of teacher certification in Canada.[8] Faced with this significant challenge, how might we address this to support mainstreaming of ESE in teacher education?

Conclusions: Mainstreaming in Faculties of Education

In Ontario and Canada, ESE and its mainstreaming in teacher education has achieved moderate success (Inwood & Jagger, 2014; Kool et al., 2021; Lin, 2002; Swayze, 2012; Towler, 1980). Until we seriously reckon with this state of affairs, and put into place practical, doable, consistent, and universal programs, ESE in teacher education will continue to operate on the margins, subject to the ad hoc measures of dedicated and persevering ESE scholars and educators.

We argue that successfully mainstreaming ESE in teacher education requires a dedicated core or compulsory ESE course, despite it being an "unusual" international programming option (Evans et al., 2017), yet an increasingly popular programming option in Canada (Kool et al., 2021). We believe ESE in teacher education would benefit, on balance, by advocating and achieving subject or disciplinary status while preserving its strong interdisciplinary roots or episteme, as other teacher education subjects such as information communication technology (ICT) have. Perhaps, in time, the issue of empty signification may ease as the "subject" of ESE more clearly and consistently defines its signifier (conceptual boundaries). This is supported by Goodson and Ball (1984) and their theorizing around "subject emergence." Although their theory applies to the emergence of subjects in PK–12 schools, because of the close and overlapping coordination between schools and teacher education, the theory could apply to teacher education as teachers

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[7] Other problems co-conspire with ESE signification (see Karrow & Fazio, 2015).
[8] It should be acknowledged that intermediate–senior (IS) teacher candidates can be certified to teach environmental studies/science. This is unique to the IS division in the province of Ontario.

are educated and certified to teach in schools. Citing the situation in Britain, almost 30 years ago, "environmental studies … [was] weakly bounded" because of its "interdisciplinary" and "integrated" nature it had difficulty gaining traction within the school curriculum (Goodson, 1995, as cited in Yueh et al., 2010, pp. 266–267). Having clear signification would help ESE establish its identity amongst other school subjects or the subjects that teachers are certified to teach.

Ontario Teacher Education Case

This could be an Ontario perspective on how this could work. A dedicated core or compulsory ESE course in teacher education would immediately confer the following. All teachers in faculties of education would be required to take a compulsory ESE course as part of their certification. Faculties of education would be required to offer such a course to be accredited by professional bodies. The outcome of this measure would be fully certified teachers demonstrating ESE competencies (knowledge, skills, and dispositions; Karrow et al., 2016) necessary to prepare a future generation of children to live in a world that is experiencing unprecedented biodiversity loss, climate change, habitat destruction, overpopulation, water and food insecurity, and pollution (Worldwatch, 2017). To adopt the common vernacular within the field of teacher education, as an example, Ontario teachers would be certified to teach ESE as a "teachable subject" (exceptions noted: IS teacher education where environmental studies/science is a teachable subject). Accordingly, admission criteria to teacher education programs could be tailored to attract future teachers who have the requisite undergraduate degrees (competencies—theoretical and practical) to support ESE's subject status (Karrow et al., 2016). This simple act would immediately confer another advantage. Within PK–12 schools, a core or compulsory ESE course (a requirement in Ontario PK–12 schools, Ontario Ministry of Education, 2017) would be part of the formal curriculum, as the capacity and credentialing in teacher education programming would now be in place.[9] As a result, all children in schools would have the benefit of their teachers' expertise and competencies to become educated to flourish in a world of which they are intimately a part of. Undoubtedly, in time, as a "teachable subject," with the issue of empty signification addressed, other challenges to mainstreaming ESE in teacher education could be addressed with benefits accruing. However, the successful emergence of a school subject by granting it "teachable status" does not on its own guarantee anything. Other factors, identified by Goodson and Ball (1984)—such as school timetabling, teacher professional development, external examinations and university departments, teacher material interests, subject characteristics, and external constituency—work in concert and contribute to a subject's emergence (Yueh et al., 2010).

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[9] In Canada, provinces mandate public education policy. This is a complex tripartite relationship between Ministries of Education that mandate PPK–12 curriculum, Colleges of Teachers that regulate certification (subject teachables), and Ministries of Colleges and Universities that grant academic degrees (e.g., a Bachelor of Education).

One of the practical realities of teaching in PK–12 schools, and by extension teacher education, is their "constraining realities" (Stevenson, 2007, p.139). Constraining realities refer to the unique systemic structures/features of PK–12 schools (e.g., knowledge viewed as discrete bodies of disciplinary knowledge, and timetabling, where subjects are taught as "discrete bodies of knowledge") that conspire against successful ESE mainstreaming because of inherent contradictions in purpose (e.g., philosophy, aims of education). For example, ESE has been championed on philosophical grounds as holistic and interdisciplinary. As such, it is argued that it should be programmed in an interdisciplinary fashion. Stevenson (2007) asserts that teaching in an interdisciplinary fashion sets up a contraction of purpose because a school's systemic structure inhibits such interdisciplinary curricular programming (unless in some unusual cases programming allows for this) due to timetabling constraints and epistemological views of disciplinary-based knowledge. Setting aside such philosophical and curricular idealism, improved subject status achieved through a full signifier (not empty) clear signification would be less of a contradiction in purpose. As a teachable subject, ESE could be programmed within PK–12 schools, and by extension teacher education, in ways consistent with its systemic structuring. Even though ESE is a requirement in Ontario PK–12 schools, because of its interdisciplinary episteme, the Ontario Ministry of Education does not grant it subject status and the timetabling privileges this would immediately entail.

Future Actions

As we have seen, the answer to the question "What's In a Name?" with regard to ESE in teacher education and its mainstreaming in faculties of education is complicated. This situation, we argue, is compounded due to the outstanding issue of ESE's empty signification. In our experience, this is an additional and significant challenge facing the mainstreaming of ESE in teacher education. We anticipate three options moving forward. These options apply to teacher education in faculties of education.

1. *Conservative option*: maintain status quo and hope for the best in teacher education.
2. *Moderate option(s):* various degrees of programmatic or curricular tinkering around the edges in teacher education, which include:
   (a) *Idealist:* continue to promote this stance by restructuring and remodeling teacher education so that it is consistent with ESE philosophy;
   (b) *Realist:* adapt ESE philosophy to the operational realities of teacher education (e.g., dedicated core/compulsory ESE course).
3. *Radical option:* revise the aim of teacher education (see Table 1).

Of the three paths forward, the *Moderate (a) Idealist* option is less desirable in contrast to the *Moderate (b) Realist* option. The latter appears to be the most timely and practical solution in

the short term. The former has been tried in the province of Ontario for years with minimal ESE mainstreaming. Furthermore, we fully support the efforts of those pursuing the *Radical* option.

Despite seemingly intractable challenges addressing ESE's empty signifiers, there are signs of hope in the province of Ontario and the larger Canadian teacher education front. The importance of ESE in teacher education and the need for it to be widely recognized in Canadian faculties of education is currently being championed by the Association of Canadian Deans of Education (ACDE) in their latest Accord titled: *Education for a Sustainable Future* (ACDE, 2022). Other stakeholders have been advocating the same; for example, The Standing Committee on Environmental and Sustainability Education in Teacher Education of the Canadian Network for Environmental Education and Communication (EECOM), the UNESCO Chair on Reorienting Teacher Education for Sustainable Development, and Learning for a Sustainable Future, among others. These "external constituents" (Goodson & Ball, 1984) and the support they garner, together with recognizing and critiquing the importance of subject characteristics vis à vis "strong signifiers," may contribute further to ESE's emergence in teacher education and mainstreaming in faculties of education.

Inquiry's Limitations

Our study has several limitations. First, our argument may be misunderstood if the balance sheet of ESE empty signification, where the benefits appear to outnumber the limitations, is taken literally. Purpose and context are important considerations in teacher education. While the benefits are valid outside the realm of teacher education the limitations are equally, perhaps even more so, valid inside the realm of teacher education. The limitations of empty signification are felt most notably in teacher education where teachers are certified to teach subjects, and the ESE signifier, because it is empty, fails to establish its subject status within education. ESE's empty signification is a problem in teacher education and works against its mainstreaming.

Second, as this is a conceptual piece, it might benefit from empirical work that could test the argument through hypothesis. For instance, the following hypothesis might serve as a catalyst to formulate pseudo-experimental research: If the ESE signifier signified a field of study (a bounded, clearly defined conceptual subject) then could it be successfully mainstreamed in Canadian faculties of education? It would be interesting to test-pilot such a hypothesis within a variety of teacher education programs across various countries and jurisdictions and conduct a cross-case comparative analysis.

Third, we are not semioticians. As such, our adaptation of semiotics (de Saussure's (1916/1983) brand of semiotics) may invite some criticism on the part of semioticians. In particular, we acknowledge the simplified form of paradigmatic analysis employed in this manuscript is part of a more complex semiotic method known as the Greimas square, where other relationships in addition to the "contrary" (e.g., contradictory and implication) are anticipated (Greimas, 1983).

Of course, our Canadian context must be recognized as a potential limitation along several fronts. Namely, in Canada, education is a provincial/territorial responsibility. With 10 provinces and three territories, the education landscape in teacher education and PPK–12 education is complex. Furthermore, because of the bi/tripartite structure of these provincial/territorial education jurisdictions, matters of curriculum, teacher certification and education, and the granting of degrees are interrelated and naturally complex. What may apply in one province/territory may not in others. By extension, what occurs in Canada, en masse, may not be relevant to other international jurisdictions. Although the ESE signifier is widely used throughout Canada, there are regional variations. The same is true internationally, as we have pointed out. It is also important to recognize that in the event our provincial/territorial or national policies fail us, UNESCO's (2020) *Education for Sustainable Development: A Roadmap* may provide important global oversight to leverage more local decision-making policies.

And finally, to the heart of our argument, that by solving the issue of "empty signification" we can quickly solve the issue of teacher education mainstreaming, is simply false. As we have tried to point out, there are other related and contributing variables conspiring against ESE teacher education mainstreaming (e.g., the constraining regularities of public schools, factors affecting subject emergence, ESE's episteme and responding interdisciplinary programming etc.). On the other hand, not recognizing that empty signification of ESE is not an issue or problem also fails to recognize that within the wider ESE community where empty signification has been flagged as a concern, it wouldn't also be worthy of examination in teacher education. In this latter sense, we have tried to shine a light on this challenging phenomenon as it relates to the ongoing effort to mainstream ESE in teacher education.

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