

# "There is no such thing as 'away'"<sup>1</sup> – An Inquiry-Based Approach to Developing Learners' Sustainability Literacy in the EFL Classroom

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## Abstract

The explosion of electric and electronic waste (e-waste) is one of the major environmental challenges of our time. Only a small amount of e-waste is properly disposed of or recycled, with most e-waste ending up in landfills or incinerators, or being exported to developing countries where it represents an even greater hazard to both the environment and human health and life. This article tackles this issue in the context of English as a foreign language teaching, arguing that exploring the global streams of e-waste and its environmental impacts at a time when there is an unprecedented demand for electric and electronic devices in all areas of life, including education, can help develop learners' sustainability literacy. The first part of the paper looks at the concept of e-waste, its economic implications, and the social impacts arising from e-waste (disposal). The ensuing part then looks at e-waste in the context of global sustainability initiatives which, for example, aim at encouraging individuals to become more committed to sustainable lifestyles and thus help to mitigate climate change. The following sections are of a more practical nature, exploring the potential of the topic for the English as a foreign language (EFL) classroom, arguing that English as a foreign language no longer solely focuses on developing learners' language skills but also a plethora of other competences that allow learners to participate in global (environmental) discourses. The practical classroom example takes an inquiry-based approach, which not only allows learners to pursue their own interests but also develops their critical thinking and problem-solving skills. In this example, Nigeria serves to illustrate the devastating effects of (illegal) e-waste (disposal) and the complex socio-economic aspects of e-waste (mis-)management.

*Keywords:* E-waste, sustainability literacy, inquiry-based learning, Nigeria.

## Resumen

La explosión de desechos eléctricos y electrónicos (*e-waste*) es uno de los mayores desafíos ambientales de nuestro tiempo. Sólo una pequeña cantidad de desechos electrónicos se elimina o recicla adecuadamente y la mayoría termina en vertederos o incineradores; o bien, se exportan a los países en vías de desarrollo, donde esto representa un peligro aún mayor tanto para el medio ambiente como para la salud y la vida humana. En el presente artículo se aborda esta cuestión en el contexto de la enseñanza del inglés como lengua extranjera, y se sostiene que la exploración de las tendencias mundiales sobre desechos electrónicos y sus repercusiones ambientales en una época donde existe una demanda sin precedentes de aparatos eléctricos y electrónicos en todos los ámbitos de la vida, incluida la educación, puede ayudar al desarrollo de los conocimientos de los alumnos en materia de sostenibilidad. En la primera parte del documento se analizan el concepto de desechos electrónicos, sus repercusiones económicas y los efectos sociales de la eliminación de desechos electrónicos. En la segunda parte, se examinan los desechos electrónicos en el contexto de las iniciativas mundiales sobre sostenibilidad que, por ejemplo, tienen como objetivo alentar a las personas para que se comprometan más con los estilos de vida sostenibles y así, contribuyan a mitigar el cambio climático. Las secciones subsecuentes son de carácter práctico, y en ellas se explora el potencial del tema para el aula de enseñanza del inglés (EFL), dado que la enseñanza del inglés ya no se centra únicamente en el desarrollo de las aptitudes lingüísticas de los estudiantes, sino también en

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una plétora de otras competencias que les permiten participar en los discursos (ambientales) mundiales. El ejemplo práctico del aula adopta un enfoque basado en la investigación, que no sólo permite a los alumnos perseguir sus propios intereses, sino también desarrolla su pensamiento crítico y sus aptitudes para la resolución de problemas. En este ejemplo se usa el caso de Nigeria para ilustrar los efectos devastadores de (la eliminación ilegal de) los desechos electrónicos y los complejos aspectos socioeconómicos del manejo (inadecuado) de este tipo de desechos.

*Palabras clave:* desechos electrónicos, alfabetización para la sostenibilidad, aprendizaje basado en la investigación, Nigeria.

## **Introduction**

Waste and its disposal is one of the biggest environmental challenges of our time. Waste comes in different forms and can be classified into different types, for example, according to its source, form, or level of hazardousness. E-Waste, which encompasses a wide range of electric and electronic products that have reached the end of their use but not necessarily life cycle, is the fastest growing type of waste (Eiselen; Zhang et al.). Many landfills overflow with discarded, often hazardous, e-waste products such as household appliances, computers, and phones, causing serious harm to both human health and the environment as they release toxic chemicals into the air, soil, and groundwater. According to the German Federal Environment Agency (Umweltbundesamt), almost 853,124 tons of electrical and electronic waste were disposed of in Germany in 2018. The vast majority of this waste (772,934 tons) was produced by private households, with businesses only accounting for 80,190 tons of all e-waste (Umweltbundesamt). These numbers impressively demonstrate that e-waste is a growing concern. The global market for tech equipment is evolving exponentially and the per capita consumption of personal electric and electronic appliances with an increasingly shorter lifespan is soaring as devices are becoming outdated and obsolete much faster than they used to.

Global environmental challenges such as the current e-waste crisis not only demand globally coordinated responses but also environmental action on the level of the individual. Here, education plays a vital role in building awareness of the environmental consequences of the choices we make as consumers and in presenting possible courses of action as increased environmental knowledge does not per se lead to increased pro-environmental behaviour (Kollmuss and Agyeman). Against this background, this paper discusses the English as a foreign language (EFL) classroom as a space for thinking and acting sustainably, particularly focusing on sustainable ways of avoiding, disposing of, and recycling e-waste.

The first section of this paper briefly introduces readers to the term e-waste, the devastating affects it can have on the environment, and selected management approaches attempting to handle the increasing global e-waste stream. The following section then looks at the potential of the topic for the EFL classroom, mainly arguing that exploring e-waste not only helps to build learners' sustainability literacy but also enhances a plethora of other foreign language-related skills and competences. The penultimate section presents an inquiry-based approach to investigating e-waste issues, allowing learners to explore and share their own ideas for innovative solutions to the problem. The article

concludes by providing concrete examples of materials and activities which can be used in the advanced EFL classroom, particularly focusing on Nigeria as one of the global 'e-waste dumping sites'.

## E-Waste

Industrialisation, urbanisation, and population growth have led to an almost unmanageable increase in waste, contributing to the environmental problems of our time. According to *What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050*, a report by Kaza et al., "global waste is expected to grow to 3.40 billion tonnes by 2050" (3). In high-income countries, many products are easily and cheaply available. Thus, the life cycle of, for example, home entertainment products or household items is no longer exploited as products are thrown away and replaced by new and better ones. Closely related to this, many consumer items are no longer expected to last (planned obsolescence), as replacing things has become the norm in today's throwaway society (Keller). This increase in waste, however, is not only economic but also cultural as our perceptions of waste are culturally constructed. In other words, social and individual norms of waste and how we should deal with waste can differ from culture to culture. An item that is waste for one person or group is still usable for someone else.

In the last decades, sustainability efforts have increased, mainly attempting to avoid, separate, pre- and recycle waste and to change to a circular economy: a more sustainable economic model, which "entails gradually decoupling economic activity from the consumption of finite resources, and designing waste out of the system." (Ellen MacArthur Foundation) These efforts go hand in hand with a growing number of people who aim to minimise (sustainable lifestyle) or even eliminate (zero-waste lifestyle) their waste output.

E-waste results from electronic and electric equipment (EEE), which has become indispensable in today's global society. It includes, among other items, large and small household appliances, IT, consumer and lighting equipment, and medical equipment systems. Puckett and Smith understand e-waste as "a broad and growing range of electronic devices" (5) that "have been discarded by their users" (7). According to the Global E-waste Monitor 2020, "the world generated a striking 53.6 Mt of e-waste, an average of 7.3 kg per capita" (Forti et al. 13). The reasons for the annual increase in e-waste are manifold and include, for example, high consumption rates, short life cycles, and few repair options. What happens to electric and electronic products once they have ended their use cycle varies from country to country and depends on the type of equipment: while some EEE is landfilled and/or incinerated, with toxic components seeping into the ground, and ultimately groundwater, or being released into the air, other e-waste products are recycled or even refurbished, reducing the need for raw materials to manufacture new products (Eiselen; Kim and Paulos). However, until now, e-waste recycling is not yet fully accepted as part of EEEs' life cycle (Rohmer). Nonetheless, the responsibility for the e-waste challenges should not simply be ascribed to individual consumer (groups) but to governments, as fighting e-waste not only requires awareness

raising among consumers but also national and international political discussions and legislative adjustments. Here, the inability of governments to effectively control and prevent the export of waste to low-income countries with minimal regulations for environmental protection may serve as illustrative examples.

Despite the fast development of recycling infrastructures, large numbers of electronic and electric devices, many of which are still functional, are illegally exported to low- or middle-income countries, for example on the African continent, with low or non-existent environmental standards, as this represents a cheaper alternative to recycling or disposing domestically, especially for countries with strict waste disposal regulations (Sander and Schilling). One example of this semi-legal approach to waste disposal is the shipping of e-waste to developing countries such as Nigeria, where hundreds of containers of used, and sometimes no longer usable, computers and phones from Europe and North America arrive in the port of Lagos each month. While the domestic reuse of those items would conserve resources, they are stripped of all reusable components such as aluminum or gold by locals before being thrown away, harming not only the environment but also the health of the population. While some routes of illegal waste dumping can be traced, the majority of e-waste is unaccounted for. To quote the Global E-waste Monitor 2020 once again, "[t]he fate of 82.6% (44.3 Mt) of e-waste generated in 2019 is uncertain, and its whereabouts and the environmental impact varies across the different regions" (Forti et al. 14).

In the following section, the e-waste challenge is discussed in the context of sustainability education. It is argued that sustainability is destined to become the paradigm of the present and future and that sustainability literacy—an understanding of how the environment, the economy, and social equity interact—also represents a vital goal for the EFL classroom.

### **Developing Learners Sustainability Literacy by Promoting Active Learning in the EFL Classroom**

The increasing momentum of environmental discourses over the last five decades (Dryzek "Politics of the Anthropocene") is symptomatic that we now live in "an emerging epoch of potentially catastrophic impact on the character of the Earth system," (1) the Anthropocene." It is safe to say that the fact that the Holocene, a period of unusual ecological stability, has come to an end is slowly finding its way into the minds of the people. However, there are also groups and individuals who are either skeptical about or even neglect the fact that industrial and individual practices have a devastating and irreversible influence on the environment, and that environmental risks are the product of our industrial societies (Beck). One example of this is the rise of populist, right-wing parties and governments, such as the AfD in Germany and the Trump administration in the United States, which unite in their climate change denialism and thus pose a challenge to the (global) climate action agenda (Lockwood).

Education seems to be needed more than ever to mitigate the effects of climate change and help support societal changes toward more adaptable, well-informed, and, first and foremost, sustainable lifestyles (Lehtonen et al.; Deetjen and Ludwig). Sustainability has often been understood as being one component of environmental literacy, most widely defined as "an awareness of and concern about the environment and its associated problems, as well as the knowledge, skills, and motivations to work toward solutions of current problems and the prevention of new ones" (McBride et al.). More recently, however, sustainability has also been understood as a literacy in its own right.

The main premise of sustainability is the imperative to meet the "needs of the present without compromising the ability of future generations to meet their own needs" (United Nations World Commission on Environment and Development). This can be achieved in many different, and often simple, ways, for example, by reducing fossil fuel use and harmful materials such as plastic (Crane), eating locally, drinking from the tap or purchasing fair trade products. As Stibbe and Luna emphasise, "[t]he ability to take steps toward building a more sustainable self and society requires far more than knowledge about *sustainability* – it requires sustainability literacy" (10). The term sustainability literacy "[...] indicate[s] the skills, attitudes, competencies, dispositions and values that are necessary for surviving and thriving in the declining conditions of the world in ways which slow down that decline as far as possible" (10–11). While the term sustainability has been criticized for being too ambiguous and all-encompassing (Salas Zapata and Ortiz-Muños), it appears to hold vast potential (MacGillivray and Franklin), especially for the classroom as it allows learners to explore a variety of environmental concerns from an environmental from different angles, such as socio-economic. In a global context, education for sustainability has been identified as a key development goal by various international organizations. For example, the United Nations Assembly declared the period from 2005 to 2014 as the United Nations Decade of Education for Sustainable Development and designated UNESCO as the lead agency for promoting the Decade. The main idea of education for sustainable development is to create "citizens capable of designing and maintaining sustainable societies" (CEL) who think critically and commit to a more sustainable future. As pointed out in the 2002 UNESCO report:

The potential of education is enormous. Seen as social learning for sustainability, education can increase concern over unsustainable practices and increase our capacity to confront and master change. Education not only informs people, it can change them. As a means for personal enlightenment and for cultural renewal, education is not only central to sustainable development, it is humanity's best hope and most effective means in the quest to achieve sustainable development. ("Education for Sustainability" 8)

In 2015, the United Nations adopted the 2030 Agenda for Sustainable Development and identified 17 Sustainable Development Goals (SDGs). Many of the SDGs closely relate to e-waste management, "such as SDG 8 on decent work and economic growth, SDG 3 on good health and well-being, SDG 6 on clean water and sanitation, and SDG 14 on life below water" (Forti et al. 30).

From a methodological point of view, education for sustainability has a strong focus on learning rather than teaching (Bowden). In the following, an inquiry-based approach to learning about e-waste and sustainability is proposed, arguing that

sustainability issues require active learning, allowing learners to discover things for themselves by engaging with real-life issues. This allows moving away from the teacher's interests, enabling learners to explore areas of their own interests, especially as critical technological advancement and technological innovations are close to the learners' lived realities.

### **Discussing E-Waste Issues in the EFL Classroom**

E-waste is a multifaceted topic and can thus serve as a starting point for exploring a plethora of social, economic, political and cultural issues. Learners can learn more about e-waste itself, including disposals that count as e-waste, possible ways of disposing of and recycling e-waste, as well as the threats poses to humans and the environment if not discarded properly. By doing so, learners can become more considerate consumers who think carefully about their purchasing decisions of electric and electronic products and the environmental consequences that result from them. In the following, it will be discussed how English, as any other subject, can contribute to a holistic and systematic education for sustainability by linking the objectives of foreign language education to discourses of sustainability.

Sustainable ways of dealing with e-waste can be viewed as global discourses as e-waste concerns are not simply local concerns but, as Glas and Volkmann point out, "[...] intermeshed with global aspects" (50). English as a lingua franca plays a vital role "in communication on interplanetary issues" (50) in a globalizing world where "social, cultural, economic, and ecological issues are increasingly interconnected" (Grimm et al. 163). In other words, these discourses require us to interact with members of other (cultural) groups and to negotiate a diversity of views which need to be reconciled with our own views. Closely related to this, engaging in transcultural and global discourses also requires a certain degree of political knowledge and skill as sustainability issues move up rapidly on the (international) political agenda (Dryzek, "The Politics of the Earth"), and "international policy making on sustainable development has progressed from environmental policy toward recent approaches of Earth system governance." (Heinrichs and Biermann 129) The English as a foreign language classroom is increasingly recognized as a place for promoting learners' political education (Kuhn), since many topics as outlined by the curriculum are inherently political topics, requiring our civic engagement and critical thinking skills which help us to react flexibly in a fast-changing society as politically mature individuals. In other words, an ecologically sustainable individual is also a politically mature individual who possesses the political knowledge, political accountability, and ability to participate and commit (Ibid.). Moreover, discussing issues of sustainability can also support learners in becoming global citizens. The idea of global citizenship is to "engage the learner in critical thinking about complex global issues, and in developing skills such as communication, cooperation and conflict resolution to resolve these issues" (UNESCO, "Global Citizenship Education" 20). In other words, students learn to participate in local and global decision making and explore local and regional but also global solutions to global problems and challenges with the ultimate aim

of promoting tolerance and acceptance of diversity. Addressing sustainability in the EFL classroom allows us to look at environmental issues from a global perspective as global citizens (Misiaszek). In global citizenship education (Deetjen), learners are encouraged to 'think globally and act locally', whereby action comprises an important component of acting as a global as much as a sustainable citizen.

Especially with the flexibilization of the EFL canon and the opening up of curricular guidelines for a variety of authentic and real-world texts, eco-artefacts (Summer) can easily find their way into the classroom. This is also beneficial to inquiry-based approaches as discussed in the following section, as an expanded canon allows teachers and learners to work, for example, with up-to-date materials, if possible chosen by the learners themselves.

### **An Inquiry-Based Approach to Discussing E-Waste in the EFL Classroom**

The idea of actively engaging foreign language learners in all steps of the learning process is increasingly gaining prominence (Dam et al.; Mercer and Dörnyei). Inquiry-based approaches to learning do exactly that as they emphasise the learners' role in the learning process by encouraging them to explore and share their ideas about topics and issues they are interested in. Inquiry-based learning can be defined as "seeking for truth, information or knowledge/understanding" and is used in all facets and phases of life. Thus, it aims for a meaningful learning experience for all learners, also paying tribute to the fact that knowing no longer means to remember information but, more importantly, to find information. The idea is that through this increased engagement with real-world related and meaningful questions, ideas, and materials, learners' motivation is increased (Ushioda) and their understanding of a given topic is deepened as they engage in meaningful communication.

Inquiry-based learning can take numerous forms and approaches, including, for example, action research (Ludwig et al.; Smith) and task- and project-based learning. The steps of inquiry-based learning activities can broadly be summarized as follows:

- 1) Open a field of awareness (spark curiosity in learners—in case they do not have any questions or are not yet aware of them),
- 2) Develop questions learners want to answer
- 3) Research the topic in and out of class, using real-world materials
- 4) Present results and give feedback
- 5) Reflect on results
- 6) Open a *new* field of awareness (ideally learners come up with their own questions based on their previous research)

Although inquiry-based learning is a learner-centered approach, the teacher takes an active role in the learning process, as they gradually develop a culture of inquiry and support learners in finding the answers to their questions, for example, by organizing the learning process and providing materials (Dobber et al.). In addition to this, the teacher

monitors the inquiry-process in that they guide learners through the process of inquiry and “keep track of student learning for purposes of making instructional decisions and providing feedback to students on their progress” (Cotton). This not only enhances the learners’ experience of the learning process but also helps them to gain knowledge and develop skills they need to live in today’s increasingly complex society. These include, among others, engaging in evidence-based reasoning and creative problem-solving. All the mentioned skills are particularly vital when engaging with issues of sustainability as, especially in times of fake news, alternative facts and hoax news, an informed discussion is only possible if one is able to evaluate the quality, accuracy, and reliability of (online) information and to form one’s own opinion based on that information. The following sample lesson sequence illustrates the potential of e-waste as a topic for the English as a foreign language classroom as learners explore the global implications of their own ‘electronic behaviour’ and thus look at e-waste from a global viewpoint.

### **E-Waste in the EFL Classroom—A Sample Lesson**

The aim of this sample lesson sequence, which follows the steps of inquiry-based learning, is to help learners understand the origins of e-waste, its negative impacts on the environment, and some methods for e-waste disposal. It focuses on a global perspective by following the international e-waste stream and illustrating how efforts toward a more circular economy are undermined as valuable and scarce resources are wasted and the responsibility for discarding e-waste is simply handed over to developing countries. More specifically, the sequence seeks to

- help learners understand what e-waste is and how it affects the environment,
- raise their awareness of the fact that EEE do not simply disappear when they are discarded,
- help them understand how our associations with (e-)waste are created by representations of (e-)waste in (digital) media and how public discourse is influenced by the ideas transmitted through media,
- encourage them to use information from real-life material to inform themselves about e-waste, taking into account the contribution of media products to our (cultural) memory,
- extend their consumer responsibility, for example, develop a more positive attitude toward waste products,
- help learners find consumer driven solutions to global e-waste problems.

Supporting learners in managing their consumption more carefully, reevaluating the utility value of their electronic and electric devices, and considering the impacts their consumption will have on society and the environment at a global scale, are important goals of this lesson sequence.

In recent years, there has been a trend of de-centring English as a foreign language by moving away from the core English countries and exploring the new or so far neglected



English-speaking countries and cultures (Eisenmann et al.; Matz et al.). Engaging with artefacts from those cultures, for example through literature, film, or digital resources, allows us to understand better how the legacy of colonization has shaped historical and economic realities. Furthermore, these resources invite us to participate in global, social, political, and economic discussions around traditions, diversity, structural inequality, and environmental issues, providing a window into worldviews and experiences to which we would otherwise have no access.

In the case of Germany, South Africa, which has been in many curricula for English for a number of years, is increasingly being replaced by Nigeria (Bartosch et al.), the most highly populated country on the African continent with one of the fastest-growing economies in the world. Nigeria offers a cornucopia of starting points for discussing issues of a global relevance, including the legacy of colonialism, ethnic, political, and religious conflicts, the distribution of resources, diversity, and corruption and criminality.

The region that later become known as Nigeria has a long (literary and cultural) history that reaches far beyond the colonial and post-colonial period as people have been living in the region for many centuries. This part of the history of what later became Nigeria should not be ignored when exploring the country's past as looking at Nigeria's recent history would most likely reinforce the (post-)colonial gaze on the country as a space of other-domination, trouble, and often violent conflict (e.g. Gilbert). The state of Nigeria came into being in 1914 when Sir Frederick Lugard announced the creation of a new colony Nigeria, uniting the Southern and the Northern Nigeria Protectorate. In 1960, Nigeria became independent from Britain. A few years later, a separatist group proclaimed the Republic of Biafra in 1967 which resulted in a three-year civil war. Since then, the country has been going through a time of considerable political upheaval and intermittent military rule with the first civilian alternation of power in Nigerian history in 2015 (Bourne for a more detailed discussion). Internationally, Nigeria has mainly drawn wider attention due to its ongoing battle with the Muslim insurgent group Boko Haram. However, Nigeria not only faces political, religious, and ethnic problems but also a cornucopia of environmental challenges, including among others, air and water pollution and desertification. Among these, Nigeria's oil industry poses one of the biggest environmental threats with the most prominent example being the Niger Delta, located in the south of the country. The delta is not only one of the most diverse ecosystems on the African continent but also one of the most polluted ones as it is increasingly destroyed by extensive dam construction, gas extraction, and (illegal) oil production.

Moreover, waste represents another major challenge. As Peluola points out: "Nigeria today is the poor collection, transportation and disposal of both municipal and industrial wastes" (4). The country, however, not only suffers from (e-)waste produced in the country itself but even more so from the large amounts of second-hand functioning and non-functioning electric and electronic devices that are imported into the country, most of which do not "work on arrival [and] only have a short second life, as they were already old, obsolete and / or damaged during the transit" (Ogunbuyi et al. 15–16). This represents one of many examples of how "Nigeria is still embedded in unequal neocolonial relationships under the guise of globalization" (Feldner 515–525). Although,

in 2004, the Waste Act (HWA) 2004 was enacted to "prevent a reoccurrence of transboundary movement and dumping of hazardous wastes in Nigeria," (Amechi and Oni 141–166) Nigeria has not seen a drastic reduction in transboundary e-waste transport and continues to provide a welcome opportunity for first-world countries to easily dispose of their e-waste. Apart from the socio-economic benefits of the import of e-waste, one of the reasons for the failed enforcement of existing regulations is the "rapid ICT transformation in recent years" which has even deepened the digital divide between countries. According to Haynes, "[i]n 1999, less than 1 percent of the population had access to a telephone; now there are 116 million active cell phone subscriptions. Forty-seven million Nigerians are on the Internet, more than in France" (301; also Obaje 31–36 for numbers on teledensity).

However, Nigeria lacks the necessary recycling infrastructure and the technical know-how to discard or recycle e-waste in environmentally-friendly ways (Adama et al.; Azodo et al.), largely relying on informal sectors (Nnorom and Odeyingbo) such as scavengers. There are hardly any collection centers and most e-waste is dumped alongside other waste, where it is often burnt, emitting harmful toxins into the air. More recently, measures have been taken to monitor the importation of used EEE into Nigeria, and the National Environmental Standards and Regulations Enforcement Agency (NESREA), responsible for the enforcement of all environmental laws, has attempted to regulate the import more efficiently. Furthermore, new initiatives have been launched to improve the situation. One example is the initiative by the Nigerian government, the Global Environment Facility, and the UN Environment, aiming to "develop systems for the disposal of non-usable and toxic waste, aiming to collect, treat and dispose of more than 270 tonnes of e-waste contaminated with persistent organic pollutants and 30 tonnes of waste containing mercury" (World Economic Forum).

It remains to be seen whether the construction of recycling facilities, the further introduction and, more importantly, enforcement of regulations, and an increase in quality of EEE imported into the country will lead to an improvement of the situation (Nnorom and Osibanjo). Ideally, Nigeria will turn into a global supplier for secondary raw materials recovered from EEE waste in the future.

There is a wealth of materials on the e-waste epidemic in Nigeria, including, among others, TED talks, statistics, infographics, social media posts, government and NGO reports as well as documentaries. With regard to the classroom, one should keep in mind that materials should provide a balanced view the environmental and socio-economic challenges linked to e-waste, for example, by including positive, creative examples of how Nigerian communities tackle and potentially overcome e-waste-related challenges.

Closely related to this, as Molthan-Hill et al. point out quite rightly, the "teaching of sustainability is often dominated by facts and figures" (4). Therefore, they argue in favour of using stories, from literary texts to (long and short) films, which "enable learners to express their thoughts and feelings about the world – and their place in it" (4). In the case of Nigeria, this opens up the possibility of exploring a large corpus of literary texts, films, viral videos, and more which relate to environmental issues such as the oil crisis. One example of such a text is Helon Habila's novel *Oil on Water*, which, through the eyes of a

young journalist who suddenly finds himself in the badlands of the Niger Delta, explores the social and environmental consequences of illegal oil extraction (e.g. Edebor).<sup>2</sup> Another example would be Nnedi Okorafor's 2016 science-fiction novel *Lagoon*, which can be read in a petrocritical way.

What makes Nigerian stories particularly worthwhile is their reconstruction of the lived realities in Nigeria (e.g. Griswold), including the ecological destruction of the country. However, in addition to the fact that there are no Nigerian literary texts known to the author that focus on e-waste, an inquiry-based approach to the diverse field of Nigerian eco-literature and linking it to the topic of sustainability may be a quite ambitious and time-consuming undertaking. Taking all this into account, the following brief description of a sequence of lessons illustrates how the topic of local e-waste and its global environmental, social, and economic implications can serve to develop learners' sustainability literacy, including all components of sustainability literacy, namely knowledge, skills, perspectives, and values (Yarime). While the focus of the project is to look at e-waste in the Nigerian context, a purely colonial view should be avoided and learners should be encouraged to look behind the colonial curtain and Nigerians being victims of e-waste, especially during steps 2, 5, and 6. The following sample lesson plan (Table 1) provides one practical example of how to approach the issue in the English as a foreign language classroom. It follows the steps of inquiry-based learning as outlined in the previous section.

|                 |  |
|-----------------|--|
| Topic           | The e-waste challenges in Nigeria: problems, challenges, and solutions   |
| Objectives      | To raise learners' awareness of the international (illegal) e-waste trade<br>To enable learners to recognize their own and others' stereotypical beliefs and attitudes<br>To train learners' film competence<br>To extend learners' oral fluency in discussions<br>To expand learners' vocabulary knowledge<br>To encourage learners to contribute to a more sustainable living          |
| Age             | Advanced learners  |
| Level           | CEFR level B2 and above  |
| Time            | 180 minutes (approximately, can be extended/shortened depending on the scope of learners' projects and time available)   |
| Materials/media | "The Digital Dump: Exporting Re-use and Abuse to Africa", a documentary focusing on the illegal electronics waste trade in Nigeria. The documentary (22:51) is freely available on <i>YouTube</i> .  |
| Summary         | In this lesson, learners will learn how to critically watch and analyse a documentary and become aware of how documentaries use specific devices to raise viewers' awareness of the consequences of the often illegal international e-waste trade. Moreover, they will choose a related topic for their own research projects. They finish with a presentation of their project results. |

<sup>2</sup> See Wenzel for a more in-depth discussion of the political ecology of Nigerian literature as well as Nixon's splendid book *Slow Violence and the Environmentalism of the Poor*. It may be worth noting that there is also a growing corpus of contemporary Nigerian poetry with a strong ecological and environmental emphasis, particularly addressing issues such as the fatal consequences of oil exploration. Readers are, for example, referred to Egya's article "Nature and Environmentalism of the Poor: Eco-Poetry from the Niger Delta Region of Nigeria," which provides a splendid introduction to the topic at hand. However, there are no Nigerian poems known to the author which focus on the topic of e-waste.

| <b>Step 1: Open a field of awareness (spark curiosity in learners—in case they do not have any questions or are not yet aware of them)</b> |  |
|--|--|
| Introduction of the topic  | <p>In order to open a field of awareness of the possible challenges of e-waste, learners are given the term e-waste and, with a partner, discuss what they think what e-waste is and which hazardous effects and socio-economic consequences it can have. In a second step, learners critically reflect their own and others' e-waste behaviour. For example, learners could be asked to</p> <ul style="list-style-type: none"> <li>• make a list of the electronic devices and appliances in their household, to reflect how often they or their parents buy new electronic products, and what they do with their old gadgets,</li> <li>• count the number of electric/electronic devices they use in a day and keep an 'e-waste diary',</li> <li>• prepare questions and interview their family members and/or friends about their electric and electronic consumption habits.</li> </ul> <p>The results are collected in class, and learners' attention is drawn to the fact that e-waste does not simply disappear but needs to be disposed of.</p>  |
| Alternative  | For a shorter and less time-consuming introduction, learners are shown one of the many e-waste cartoons freely available on the Internet.  |
| Extension  | The teacher then introduces learners to Nigeria's past and present.  |
| Introduction to documentary  | <p>Learners are told that they are going to watch the documentary "The Digital Dump: Exporting Re-Use and Abuse to Africa" on international e-waste practices and the e-waste situation in Nigeria. The documentary can either be watched using a whole-class or flipped classroom approach. Following the flipped-classroom approach, learners are asked to watch the documentary at home and fill in a while-viewing sheet. Depending on the learners' level, the worksheet could either include more closed questions to guide them through the viewing, or more open ones such as the following:</p> <ul style="list-style-type: none"> <li>• <i>Make a list of the results of uncontrolled e-waste exportation.</i></li> <li>• <i>How is the export of e-waste to African countries justified?</i></li> <li>• <i>What happens to the electronic products in Lagos?</i></li> <li>• <i>Which 'voices' are represented in the documentary?</i></li> <li>• <i>What do the repair workers say about their lives?</i></li> <li>• <i>Describe a typical e-waste journey.</i></li> <li>• <i>What happens to waste items that cannot be recovered or recycled?</i></li> </ul> <p>In addition to the content, learners' critical media literacy can be enhanced by drawing learners' attention to the production techniques, including voice overs, interviews, music, and graphics but also points of view as well as potential audiences but also issues such as subjectivity vs. objectivity and fictionality vs. non-fictionality. Relevant vocabulary, such as hazardous, digital device, legacy, entrepreneurial, scavenger, should be clarified beforehand. The learners then watch the film at home and bring their viewing experiences, answers, and questions to the classroom.</p> |
| <b>Step 2: Develop questions learners want to answer</b>   |  |
| Decide on project topics and get together in groups according to learners' interests   | <p>In the next step, learners get together in mixed-skills groups based on the topics/questions they are most interested in. In order to do that, each learner writes their name and main topic/question of interest on a card and pins it on the blackboard, which functions as a notice board. Learners are given time to find other learners who have the same or similar research interests. Possible research topics could, among others, include:</p> <ul style="list-style-type: none"> <li>• Juxtaposing selected advertisements of ICT and images of their illegal discarding in Nigeria, as for example shown in the documentary</li> <li>• Researching relevant hashtags and postings on social media</li> <li>• Investigating local or governmental projects and initiatives 'turning the tide' on illegal e-waste</li> </ul>  |

|   |  |
|---|--|
|   | <ul style="list-style-type: none"> <li>• Exploring possible solutions to Nigeria’s e-waste problem</li> <li>• Researching the informal electronic waste sector in Nigeria</li> <li>• Finding out more about Germany’s e-waste disposal practices</li> </ul>  |
| <b>Step 3: Research the topic in and out of class, using real-world materials</b>   |  |
| Project work  | The learners work on their projects during class time or at home. The role of the teacher is to guide learners through their project work and provide materials and (language) support where necessary.  |
| <b>Step 4: Present results and give feedback</b>  |  |
| Presentation of project results and / feedback  | The learners present their project results using a class Padlet, which not only allows them to prepare multimedia presentations but also comment on each other’s presentations.  |
| <b>Step 5: Reflect on results</b>   |  |
| Reflection  | Together, the groups reflect the project results, allowing learners to explore the topic in more depth and identify some broader perspectives.   |
| <b>Step 6: Open a new field of awareness (ideally learners come up with their own questions based on their previous research)</b> |  |
|   | <p>The project results open up new fields of awareness, leading to new questions for further inquiry. Questions could include:</p> <ul style="list-style-type: none"> <li>• <i>How could you reduce your personal / family e-waste?</i></li> <li>• <i>How are the e-waste issues addressed in other texts, for example, literary texts?</i></li> </ul> |

Table 1: Discussing e-waste in the EFL Classroom—A Sample Lesson

## Conclusion

The quantity of global e-waste keeps growing rapidly, with a large amount of e-waste not being accounted for. One of the largest challenges to managing the current e-waste stream is that it is not easy to dispose of as the toxic materials in many electric and electronic devices can have serious hazardous effects on the environment. Education plays a vital role in raising learners’ awareness of e-waste as a global environmental, economic, political, and social challenge. These educational endeavours should go beyond consumer education approaches, enabling learners to take a more global perspective and participate in global sustainability discourses. By doing so, learners build their capabilities for critical thinking and problem solving in participatory learning environments. The described lesson sequence focuses on Nigeria, allowing learners to learn more about the global effects of local behaviour and the struggles countries such as Nigeria are going through on our way to a more sustainable future.

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