Journal of Futures Studies
2024,Vol. 28(3) 65-81
DOI: 10.6531/JFS.202403_28(3).0005

Article

Images of Global Issues in Secondary School Biology Textbooks of Ethiopia

Takele Zerihun[1], Mekonnen Dawit[2,*]

[1]PhD. Student, Department of Curriculum and Instruction, Addis Ababa University, Addis Ababa, Ethiopia
[2]Associate Prof., Department of Curriculum and Instruction, Addis Ababa University, Addis Ababa, Ethiopia

Abstract

This study examines how secondary school biology textbooks in Ethiopia represented images of global issues and to what extent the textbooks' activities enable students to explore alternative solutions to global problems. The study used content analysis methods, and all pages in the textbooks were used as units of analysis. The results showed that the textbooks represented two images of global issues. On the one hand, the textbooks emphasized a techno-utopian image such as biotechnology and genetic engineering as one of the means of solving the world's major problems. However, they did not portray the downsides of technological progress. On the other hand, the textbooks represented a catastrophic world and portrayed the world as a place where problems of rapid population growth, environmental degradation, global warming, and climate change are affecting life on Earth. The textbooks did not incorporate sufficient open-ended and future-focused learning activities that could allow students to explore alternative future solutions to global problems. Lessons for science curriculum development are drawn.

Keywords

Textbooks; Global issues; Future images; Techno-utopian; Techno-dystopian

Introduction

Textbooks are one of the most important curriculum materials that can help to develop students' images of the real world through the dissemination of valued knowledge. Yerushalmy (2014); Lassig (2009); Stray (1994); and Pingel (2010) indicate that school textbooks are designed to present the abstract curriculum objectives and intentions of its designers into readily learned knowledge in the form of subjects, topics, contents (word texts, picture, figures) and suitable activities. One of the goals of the curriculum is to promote students' awareness of global issues and problems.

Authorities in the curriculum field described that dimensions of global issues in a curriculum refer to integrating worldwide concerns, issues, trends, events, interdependence, and perspectives that have implications at the global level across school subjects (Al-Shuga'a et al., 2019; Anderson, 1982; Flouris, 1997; Hanvey, 1982; Manniona et al., 2011; & Merryfield, 1991). Furthermore, Pike & Selby as cited in Hicks (2003) proposed four elements of global education: spatial dimension, temporal dimension, issues dimension, and process dimension. The spatial dimension is related to the explorations of local-global interdependence. The temporal dimension is linked with the changes in global issues over time. The issues dimension deals with problems of global issues that require global attention, and the process dimension is related to the pedagogy of global issues that emphasize participatory, holistic, and experiential learning. This article aimed to investigate how images of global issues are represented in secondary school biology textbooks in Ethiopia.

* *Corresponding author*.
E-mail addresses: zerihuntakele82@gmail.com (T. Zerihun), dawit.mekonnon@aau.edu.et (M. Dawit).

Received: 01 January 2023 and Accepted: 28 August 2023

Images of global issues

The idea of 'image' is described as an active structure of knowledge construction and knowledge is an image of reality that is imprinted in an individual's mind through psychic content (Mitchell, 1986). Moreover, Grunig (1993); Nadeau et al., (2008); Cotirlea (2015); and Finke (1993) assert that image is the product of the received messages that create perceptions in an individual's mind. Furthermore, elements of images could be a combination of temporal, spatial, and value dimensions. In temporal dimensions, images may refer to past, present, or future events (Boulding, 1973; Finke, 1993; Polak, 1974; & Vidergor, 2018). Spatially, images may refer to personal, local/national, and global issues (Hicks, 2007 & Vidergor, 2018). In the values dimension, images may serve as a set of evaluating criteria between desirable and undesirable human actions (Bell and Mau, 1971). Thus, the knowledge presented in school textbooks is the combination of temporal, spatial, and value dimension that can play a significant role in students' image construction and awareness creation about the world.

Thus, people can develop and construct images of the future based on knowledge, values and beliefs, past and present situations, and future expectations. Scholars categorize images of the future of global conditions from different perspectives, based on how human senses the world, interpret, and take actions. For example, Polak (1974) categorized images of the future under optimism versus pessimism and essence versus influence. The 'essence' refers to an unchangeable course of events, and the 'influence' refers to the supposed or rejected possibility of human intervention in the course of historical events. The 'optimism' refers to positive expectations of future events, and 'pessimism' refers to negative expectations of future events. Dator (2009), on the other hand, categorized images of the future of the world into four scenarios. The first is continued economic growth that anticipates a significant amount of sustainable improved changes in the world. The second is a collapse scenario that assumes continued economic growth is unsustainable and anticipates the worst future for the world. The third is a disciplined or conserver society for sustainability. The fourth is transformational societies that focus on the idea that technological advancement can transform humans into a new way of a better life.

In addition, Slaughter (1982) proposed six perspectives of images of the world. The first is environmentalist perspectives that see the future as drastic, and focus on a strong sense of global crisis. The second is the technocratic perspective that emphasizes the role of technology in solving the major problems of the world. The third is systems perspectives that believe in holistic system thinking to make the world better. The fourth is ecologists' perspectives that urge a strong sense of the costs of industrialism, and technophobic. The fifth is the developmentalist perspective that sees the world as complex and interdependent. The sixth is eclectic perspectives that see the future world from post-modernist views. However, it can categorize images of the world proposed by Dator and Slaughter into two major camps: techno-utopian and techno-dystopian images. The techno-utopian images are perspectives that focus on the power of technology as the engine of change and salvation of society, and believe technology could transform society into a better future (Barry, 2012; Danaher, 2022; & Jeffcote, 2003).

On the other hand, Kwazo et al. (2014); Dai and Hao (2017); Alexander (2015); and Townsend (2016) believe that global problems such as environmental degradation, disposal of waste that pollutes air and water, biodiversity loss, overconsumption of natural resources, ecological imbalances, climate change, global warming, and many other social, political and economic problems are the consequences of technological advancements. They represented these technological disasters as techno-dystopian images. Moreover, dystopia and pessimistic images of the world have been familiar in scholars' work. For example, Malthus (1798) in his essay "*The Principle of Population*" argued that infinite progress and prosperity could bring serious problems, and lead to human self-destruction because of unchecked exponential population growth and scarcity of resources required for human survival. Meadows et al. (1972) in the book "*The Limits to Growth*" argued that the gradual depletion of nonrenewable resources coupled with increasing pollution and rapid population growth will result in a collapse of the world's industrial, agricultural production and human shortly unless corrective actions should be taken to reduce the possibilities of collapse, and ensure sustainability.

However, how the aforementioned images of global issues are influencing knowledge presentation in school textbooks to shape desirable images of the future in students has not been researched much. Shane (1967); Potter (2010); and Toffler (1970) claimed that increasing individuals' "cope-ability" with future shock and preparing the young generation to cope with the premature arrival of future shock should be one of the prime objectives of education. Moreover, Hayward & Candy (2017) and Ramos (2011) argued that by cultivating people's 'response

quality' to optimistic or pessimistic future images, it is possible to navigate towards empowerment, actions, and changes.

In this research, the concept of images and images of the future refers to messages, ideas, and values presented in the secondary school biology textbooks of Ethiopia concerning the economy, social, political, technological, and environmental issues from global perspectives and categorized and analyzed under utopian and dystopian images. Several studies show that textually codified messages as legitimate knowledge presented in school textbooks have a powerful influence on students' images/worldviews constructions in positive or negative ways (Al-Dughaim, 2001; Anyon, 1978; Scotto, 2016; & Tikkanen, 2016).

Exploring alternative future images of global issues

School textbooks should allow students to explore alternative futures images for the existing and emerging global issues and problems, choose desirable futures, and motivate them to take action to create a better future world (Mata et al., 2022; Inayatullah, 2008; & Poli, 2018). Smith (2010) suggests that developing students' ability to explore alternative images of the future can help them to counter future fears. Thus, to help students construct alternative images of the future, school textbooks should incorporate open-ended and future-focused learning activities (Hoffman et al., 2021). Similarly, Bateman (2012) claims that open-ended and future-oriented activities could offer students the opportunity to make critical evaluations of problems, choose a desirable solution, and take action in their lives. Thus, developing students' skills of alternative future exploration has significant importance in fostering their critical thinking, reflections on the problems, making sense of alternative images of the future, cultivating hope, empowering and motivating them to take their ideas into action (Page, 2000; Pauw, 2021; & Paige & Lloyd, 2016). Therefore, by helping young students to question the future, and analyze and reflect on the existing and emerging problems using scenarios, it is possible to prepare them as future change agents (Mata et al., 2022; Inayatullah, 2008 & Poli, 2018). For these reasons, activities in school textbooks should open up such possibilities for students in their learning. Furthermore, Angell and Avery (1992); Calder (2000); Ukpokodu (2020); and Hicks (2004) argued that one of the goals of global education is to engage students in examining the related causes and effects of global problems and enable them to explore alternative future solutions, make critical reflections, and motivate them to take local actions.

Statement of the Problem

Integrating perspectives of global issues into school textbooks is crucial in developing young students' images of global issues and problems. Boulding (1973); Dichter (1985); and Mitchell (1986) argued that messages presented in textbooks' contents have a powerful influence on students' image constructions about the realities of the world. Consequently, images of the realities of the world constructed by students have a powerful influence on shaping their behaviors, making choices and decisions, and taking actions in their lives (Lloyd et al., 2004; Paju, 2021; & Rubin et al., 2001). Therefore, images and images of the future individuals hold on various contents may be optimistic, pessimistic, or neutral (Boulding, 1973; Heinajarvi, 2018; & Lloyd et al., 2004). Polak (1994) argued that societies that generate positive and optimistic images of the future are flourishing, whereas societies that generate only negative and pessimistic images of the future are often stagnant or declining. Generally, positive and optimistic images held by individuals have a crucial function in promoting hopeful thinking, a potential source of motivation, and guiding their present behavior to the desired actions (Ahvenharju, 2022). In contrast, individuals who focus on pessimistic and negative images may lead them to narrow down their thinking, develop hopelessness feeling, disempowered, have poor psychological well-being, and show poor self-confidence in the capacity to influence the future (Arnaldi, 2008 & O'Connor et al., 2007).

In countries like Ethiopia, where the national curriculum textbooks are developed centrally, and delivered top-to-down from the Ministry of Education to schools, and where there are low levels of digital media and limited information access, textbooks are the main source of knowledge for most students and teachers. For these reasons, textbooks have crucial roles in students' image constructions about the realities of the world. Therefore, textbooks should present different perspectives of images of global issues and problems to promote students' positive and desirable images of the future, and empower and prepare them as future change agents. However, there are limited

studies that can inform curriculum practitioners on how school textbooks are dealing with the dominant images of global issues. The dominant images of global issues in the current society are generally categorized into utopian and dystopian images (Son, 2013). Utopian images portray desirable societies and are associated with optimistic images that show hope. Whereas, dystopian images portray undesirable societies and are associated with pessimistic images that show fears (Claeys, 2017). Moreover, the dominant utopian images of the world mainly related to techno-utopian, continuous economic development, human flourishing, engineered and artificial nature, and the great hope of the power of science and technology to solve the major problems of global issues (Gvishiani, 1979; Hughes et al., 2013; & Kroijer, 2020).

In contrast to utopian images of the world, dystopian images of the world mainly dominate the current society's perception in the forms of catastrophic human-environment relations and depicted technological disasters such as global warming, climate change, ecological degradation, pollution, and problems of rapid population growth (Buckland, 2016; Kwazo et al., 2014; Son, 2013; & Townsend, 2016). Therefore, examining how school textbooks integrate these dominant images of global issues is crucial to inform curriculum designers so that they design a curriculum that can help to promote students' images of the desirable world.

However, several studies conducted on textbooks' content analysis have mainly focused on identifying the extent to which school textbooks integrated global issues that could help to promote students' global awareness. Researchers around the world, such as Rosenthal (1985); Karvankova et al. (2015); Al-Shuga'a et al. (2019); Cruz (1998); Erfani (2013); and Chou and Ting (2016) did textbook content analysis, and the results of these studies show that the textbooks integrated global issues and problems that could help to promote students' global awareness. In addition, the studies indicated that pedagogy used in teaching students about global issues in classrooms emphasized rote memorization approaches. Specifically, in the Ethiopian context, one of the roles of education aims is to produce students who have international outlooks, competitive at national, regional, and global levels, understand themselves as citizens of their country and of the world, and have the understanding on the different aspects of global issues (MoE, 1994 & 2020). The Curriculum Framework for general education states:

> The framework presents a curriculum vision that aims at cultivating all-rounded, ethical, self-reliant citizens who are armed with 21st-century skills to become productive and competitive regionally and globally. This is followed by curricular aims which include producing citizens who have the competence essential for life, further learning, and employment. The aims also comprise nurturing learners who possess scientific and technological literacy, can think critically, solve problems, and contribute to economic advancement and social change (Ministry of Education, 2020, p. 3).

One of the objectives of the Ethiopian curriculum framework also intends to help students "utilize critical thinking, problem-solving, and communication skills to productively engage with the constantly changing local, national, and global realities" (p. 19). The education and training policy developed in 1994 and the newly revised education policy in 2023 intend to prepare citizens who are well-informed about global problems and are globally competitive (MoE, 1994 & 2023). However, how these aims of education are translated into school textbooks is not sufficiently examined. The majority of research conducted in textbooks' content analysis in Ethiopia was focused on examining environmental issues. For example, Abebe et al. (2013); Wolde (2008); and Aklilu (2012) investigated how Ethiopian secondary school biology textbooks integrated environmental issues. The results of these studies revealed that the textbooks integrated environmental issues to some extent, and they concluded that the integration was insufficient. However, these local researchers have not adequately examined how the textbooks integrated images of global issues dimensions, and the potential of the textbooks' activities in promoting students' abilities of alternative future exploration to the dominant images of global issues. This study aimed to examine how images of global issues are represented in the textbooks and the extent to which the textbooks' activities offer students the opportunities to explore alternative future solutions for the problems of global issues. Thus, this study attempted to answer the following two questions.

1. How are images of global issues represented in Biology textbooks?
2. Do the textbooks' activities offer students the opportunities to explore possible alternative solutions for the problems of global issues?

Significance of the Study

This study makes some important contributions to inform curriculum designers, textbook developers, and teachers' classroom instructional practices on how utopian and dystopian images of global issues should be represented in a balanced way in school textbooks to construct images of the desirable future of the world in students. Ramos (2011, p. 102) and Page (1996, p. 128) argued that the presentation of over-optimistic or over-pessimistic messages in textbooks' contents of the social, economic, technological, and environmental issues cannot prepare students as future change agents, and may make them disempowered. In addition, the results of this study can help to close the observed research gaps.

Methodology

This study is motivated by a desire to investigate how images of global issues are represented in the secondary school biology textbooks of Ethiopia, and the extent to which the textbooks' activities offer students the opportunities to explore alternative future solutions for the problems of global issues. This study contributes to determining the potential of biology textbooks in promoting students' global understanding, helping in constructing different perspectives of images of global issues, and preparing them as future change agents. To achieve these goals, this study employs qualitative and quantitative content analysis techniques. Therefore, grade 9 to 12 biology textbooks were selected for the content analyses. Biology education is widely believed to have significant contributions to creating an understanding of dimensions of global issues such as environmental issues (pollution, climate change, and conservation), health issues (drug and sexual problems), technological issues (genetic engineering, agricultural production), social issues (rapid population growth, food, and nutrition), and ecological issues (living in harmony between human and environment). Thus, many of the contemporary and future global issues require an understanding of biological knowledge to solve global problems, and biology education seems to take a lion's share in bringing a global perspective to science education (Aklilu, 2012; MoE, 2009 & Rosenthal, 1985). This was the rationale behind the selected biology textbooks for this study.

Therefore, all pages in the textbooks were used as units of analysis. The presence of messages of utopian and dystopian images related to global issues in the textbooks was used as units of observation. Accordingly, messages related to global issues on all pages of the textbooks were extracted and coded under respective generic categories using short forms of sentences/clauses, phrases, or words. The analyzing criteria of generic categories of utopian and dystopian images related to global issues in the textbooks are conceptualized as listed in Table 1.

Table 1: Descriptions of generic categories and sub-categories

Sub-categories	Classification of generic categories of dystopian and Dystopian images	
	Utopian images are characterized as optimistic messages about global issues that can promote hopeful feelings/emotions.	Dystopian images are characterized as pessimistic messages about global issues that can produce painful feelings/emotions.
Politics	Stability, democratic government…	Conflict, war, dictatorship government...
Economy	Less poverty, resourcefulness, high productivity, endowed with natural resources…	High poverty, destroying nature for economic gain, scarcity of natural resources, depends on foreign aid…
Social	Balanced population growth, good health services, healthy society…	Unchecked population growth, poor health, diseases, food shortage, slums…
Technology	Advanced technological innovations, techno-solutions…..	Lack of technological innovations, technological disasters…
Environment	Conserved, green environment, good climate, good ecology, and biodiversity...	Degraded, drought, effect of climate changes, pollution, global warming….

The generic categories of utopian and dystopian images were developed based on reviews of different literature on the theory of images and images of the future and empirical research such as Boulding (1973); Polak (1974); Ono (2003); Son (2013); Rubin and Linturi (2001); Bell and Mau (1974). The generic categories of utopian and dystopian images were further sub-categorized using the economic, social, political, technological, and environmental issues (PEEST) analysis model which is modified from Jenkins (2021, p. 56) instrument as shown in figure 1.

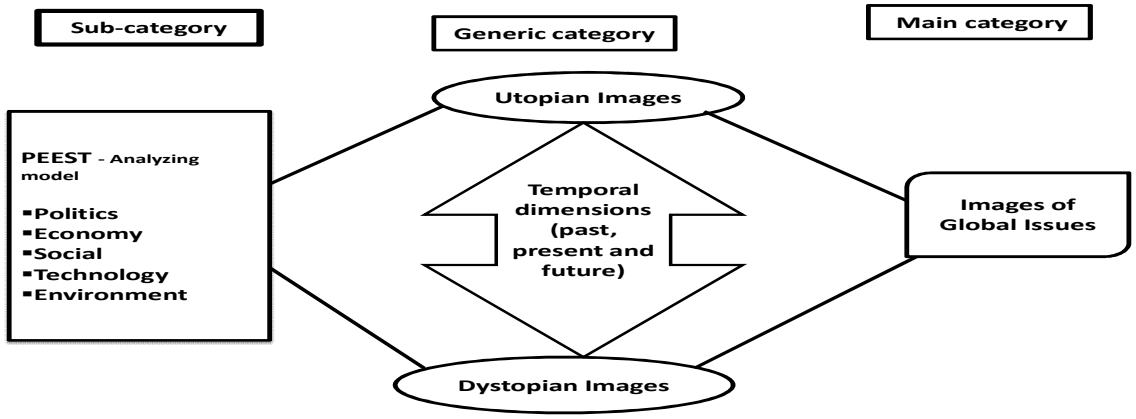


Fig. 1: Instruments for content analysis categories

Furthermore, all activities presented in the textbooks were used as units of analysis. Open-ended activities were used as a unit of observation to examine their potential to offer students the opportunity to explore alternative future solutions for the problems of global issues included in the textbooks. Thus, quantitative content analysis was employed in collecting data related to the nature and frequencies of closed-ended and open-ended questions. Consequently, four major categories of open-ended activities were developed from the emerging themes. The four emerged themes of open-ended questions are questions that could lead students to anticipate the negative future consequence of the existing problems of global issues if they continue as they are. Second, open-ended questions could lead students to anticipate positive future consequences if the world's people can use the existing global opportunities to change the world for the better. Third, open-ended questions could allow students to explore alternative solutions for the problems of global issues included in the textbooks. Fourth, open-ended questions encourage students to participate in their localities to take action to solve the problems of global issues.

To ensure the reliability and consistency of data coding, two high school biology teachers who are teaching biology subjects and are familiar with the textbooks were trained to code the data. During training, the researchers explained the instruments, principles, and procedures to be used in the process of data coding. Two chapters from one biology textbook were given for the two coders to code independently as a pilot test. The researchers checked whether the selected items by the independent coders fitted exactly into the same categorizations. Consequently, discussions were made between the coders and researchers, and corrections were given to the coders to clarify further the procedures of coding. Finally, the coders collected and coded the whole data in the sampled textbooks independently. The composite inter-coder agreement calculated was 0.85. This shows that the coders had high coding reliability.

Results

This section presented, described, and interpreted the data in relation to the research questions.

Utopian images of global issues presented in the textbooks

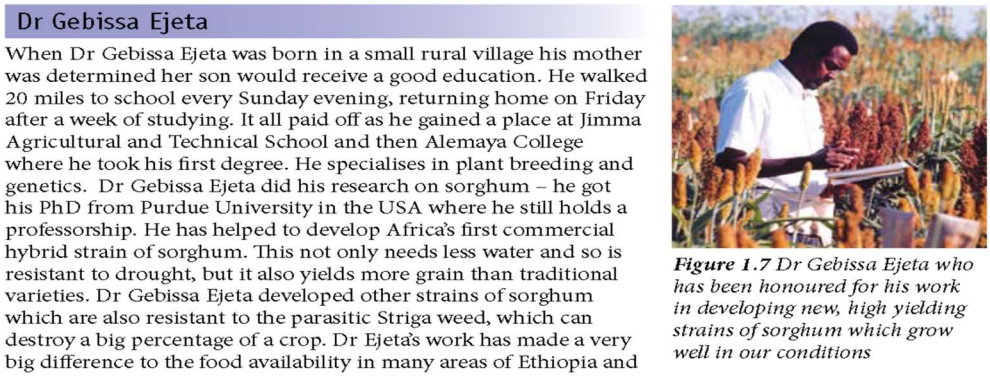
Utopian images in school textbooks can be represented as desirable and optimistic messages that show a kind of good society, and clarify societal future aspirations in the forms of "educated hope" (Papastephanou, 2009). Thus, the findings show that biology textbooks integrated some utopian images related to global issues. As listed in Table 2, the textbooks portrayed some utopian images of global issues related to technological, social, and environmental dimensions. However, the textbooks did not include utopian images of the political and economic dimensions of global issues.

Table 2: Utopian contents presented in biology textbooks

Sub-categories	All utopian messages extracted from the textbooks' contents
Technology	• "Professor Tilahun develops a vaccine using genetic engineering for terrible cattle disease rinderpest and using similar methods he is working on to develop an effective vaccine for HIV/AIDS (G-9, p. 3)". • Using plant breeding and genetics technology, "Dr. Gebissa Ejeta developed Africa's first commercial hybrid strain of sorghum that needs less water and is resistant to drought (G-9, p. 5)" • "Biotechnology is the use of microorganisms to make things that people want in industrial production and biotechnology has always been extremely important (G-10, p. 1)" • "Biotechnology is one of the fastest growing industries around the world, and is beginning to grow in Ethiopia too (G-10, p. 2)" • "Biotechnology offers us the hope of better crops and more food, both for our people and to sell internationally (G-10, p. 9)" • "Applications of Biotechnology and using genetic engineering in agriculture, selective breeding to change our livestock and crops to improve the growth rates of plants and animals: such as big grains, resistance to disease or plenty of milk (G-10, p. 9)" • "Applications of biotechnology in food production such as mycoprotein, which means 'produce protein from fungus, it is a high protein, low-fat meat substitute used by vegetarians, people thought a world food shortage was on its way (G-10, p. 10)" • "Applications of Biotechnology are extremely important in modern medicine to develop vaccines and to create new medicines (G-10, p. 11)" • "Application of biotechnology in energy production such as the generation of biogas from human and animal waste is becoming increasingly important in both the developing and the developed world (G-10, p. 11)" • "The whole world needs a source of new genetic material to overcome changes in the world climate, will get the best possible yield from their crops, and the most milk from their cows, sheep, goats or camels (G-10, p. 48)" • "The world's population is growing at an alarming rate, extra people all need food, addressing the problem of producing the extra food, genetic modification of existing crop plants to give more production and to challenge changing environment of global warming (G-11, P, 26)" • "Biologists are also able to advise on ways of reducing the rate of population growth effective methods of contraception (G-11, p. 27)" • "Genetic engineering has many potential benefits such as disease could be prevented by

		detecting people/plants/animals that are genetically prone to certain hereditary diseases, fingerprints have been used for many years to help place a suspect at the scene of a crime, genetically engineered plants and animals can be produced to give increased growth rates and reduced susceptibility to disease, genes could also be manipulated in trees, for example, to absorb more CO2 and reduce the threat of global warming (G-12, p. 136-137)"
Social	•	"Vaccination is one of the greatest achievements of medicine that saves millions of people from the effects of devastating diseases (G-9, p. 133)", "controlling rapid population growth using contraception (G-10, p. 109 and G-12, p. 91)", "specialized biotechnology knowledge help sick people on ways of staying healthy and cures for genetic diseases (G-11, p. 28)", "produce drugs that kill the HIV/AIDS virus or at least stop it from reproducing (G-11, p. 31)"
Environment	•	"Tree planting campaign to rehabilitate trees and forests we have lost (G-9, p. 223)", "to protect our natural resources around the world, people are becoming more aware of the need for conservation, non-renewable resources are used sparingly and renewable resources are managed so that they can last for the foreseeable future (G-10, p. 191)"
G*-grade, p*-page		

As depicted in Table 2, utopian images portrayed in the textbooks related to global issues are emphasized more on the application of biological knowledge (biotechnology and genetic engineering) to technological advancement to solve the social and environmental problems of the world. For example, Grade 9 and 10 biology textbooks present:

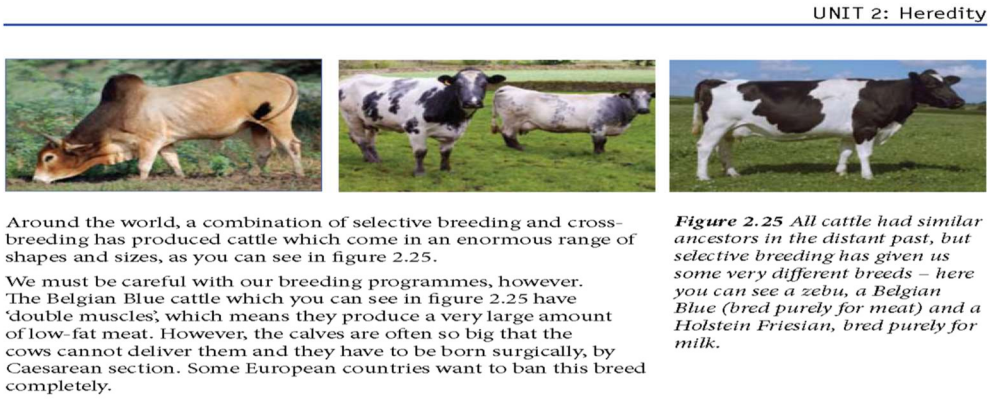


Dr Gebissa Ejeta

When Dr Gebissa Ejeta was born in a small rural village his mother was determined her son would receive a good education. He walked 20 miles to school every Sunday evening, returning home on Friday after a week of studying. It all paid off as he gained a place at Jimma Agricultural and Technical School and then Alemaya College where he took his first degree. He specialises in plant breeding and genetics. Dr Gebissa Ejeta did his research on sorghum – he got his PhD from Purdue University in the USA where he still holds a professorship. He has helped to develop Africa's first commercial hybrid strain of sorghum. This not only needs less water and so is resistant to drought, but it also yields more grain than traditional varieties. Dr Gebissa Ejeta developed other strains of sorghum which are also resistant to the parasitic Striga weed, which can destroy a big percentage of a crop. Dr Ejeta's work has made a very big difference to the food availability in many areas of Ethiopia and

Figure 1.7 *Dr Gebissa Ejeta who has been honoured for his work in developing new, high yielding strains of sorghum which grow well in our conditions*

Fig. 2: Biotechnology application (Grade 9, p. 5)



UNIT 2: Heredity

Around the world, a combination of selective breeding and cross-breeding has produced cattle which come in an enormous range of shapes and sizes, as you can see in figure 2.25.

We must be careful with our breeding programmes, however. The Belgian Blue cattle which you can see in figure 2.25 have 'double muscles', which means they produce a very large amount of low-fat meat. However, the calves are often so big that the cows cannot deliver them and they have to be born surgically, by Caesarean section. Some European countries want to ban this breed completely.

Figure 2.25 *All cattle had similar ancestors in the distant past, but selective breeding has given us some very different breeds – here you can see a zebu, a Belgian Blue (bred purely for meat) and a Holstein Friesian, bred purely for milk.*

Fig. 3: Genetic engineering application (Grade 10, p. 47)

Based on the findings, it can be concluded that the textbooks emphasized the representation of techno-utopian images of global issues. Danaher (2022); Alexander and Rutherford (2020); and Barry (2012) defined techno-utopian images as a belief in technology to solve the major social, economic, and environmental problems of global issues, and trust in the power of technology to transform society.

Dystopian images of global issues presented in the textbooks

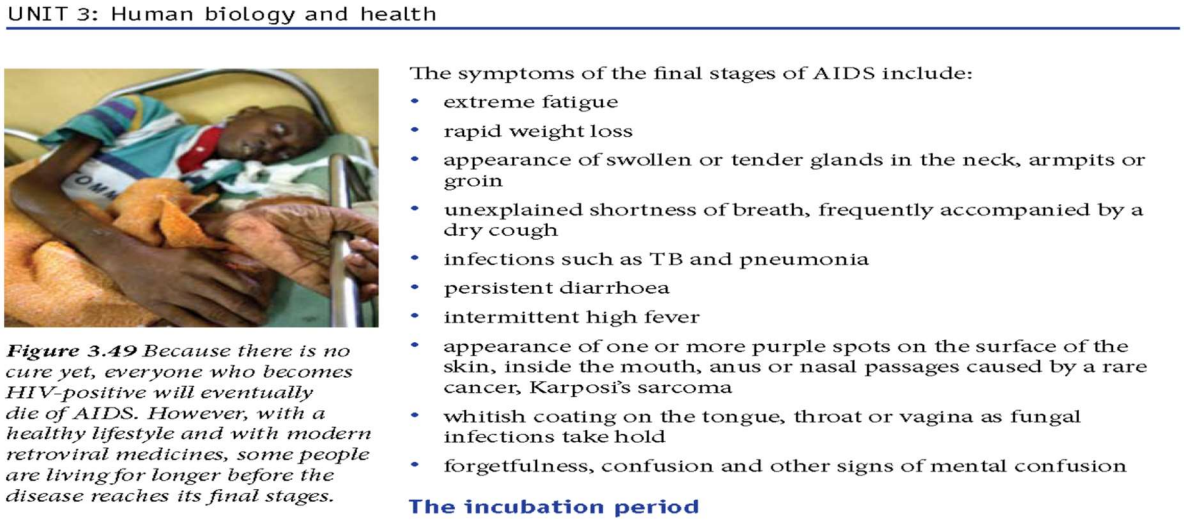
Dystopian images in school textbooks can portray a kind of bad society or undesirable human practices in the form of "educated fear" (Papastephanou, 2009), which make a person feel most worried or form painful emotion (Ono, 2003).

As listed in Table 3, the textbooks presented more environmental and social problems related to global issues. However, dystopian images of political and economic dimensions related to global issues were not included in the textbooks.

Table 3: Dystopian contents presented in biology textbooks

Sub-categories	All dystopian messages extracted from the textbooks' contents
Social	The textbooks represented the world as: • "malnutrition affects the health of millions (G-9, p.65)", "Every year around the world, millions of people die from untreated diarrhea (G-9, p.78)", "TB (G-9, p.140)", "malaria (G-9, p.141)", "cholera outbreaks (G-9, p.145)", "HIV/AIDS (G11, p.30)", "drug abuse (G-10, p.69)" • "Effects of the alarming growth of world population preventing or slowing development (p.26, G11 and G-12, p.87)"
Technology	• "There are some possible problems with the new biotechnologies such as creating pesticide-resistant insects (G-10, p.9)", "genetically modified crops are often not fertile, which means farmers have to buy new seed each year (G-10, p. 9)", "moral debates over using genetic engineering (G12, 139)"
Environment	• "The world is under the pressures of greenhouse effect and global warming (G-9, p.215 and G-10, p.199, 202, p.26, G11)", "large-scale deforestation (G-9, p.216 and G-10, p.199)", "increases of the amount of carbon dioxide released into the atmosphere (G-9, p.216)", "temperature at the surface of the earth to rise and this contribute to the kill off the algae on which the coral polyps feed, extreme droughts, strong hurricanes and heavy rains and flooding which are affecting many different parts of the world (G-9, p.216 and G-10, p. 200,202)", "agricultural monocultures greatly reduce biodiversity, effects of biodiversity lose (G-10, p. 186, G-12, p.66, 77)", "problems of climate change, pollution and human activities have reduced biodiversity and caused many species to be pushed to the verge of extinction around the world (G-10, p. 187 and G-10, p.193)", "problems of pollution can happen on a very small local and very large global scale affecting by acid rain that has damaging effect on the environment, change in sea pH, destroyed of ecosystems forever, global warming and the ozone hole and air pollution (G-10, p.198, 200-202)", "climate change will increasingly influence all types of ecosystems (G-12, p.76)"
G*-grade, p*-page	

Table 3 shows that the textbooks represented the world as a place where millions of people are suffering from malnutrition, lack of treatment, and die from diarrhea, HIV/AIDS, TB, malaria, cholera, drug abuse, and the effects of rapid population growth. For example, the effects of HIV/AIDS are stated in Grade 10 biology textbooks as:



UNIT 3: Human biology and health

Figure 3.49 *Because there is no cure yet, everyone who becomes HIV-positive will eventually die of AIDS. However, with a healthy lifestyle and with modern retroviral medicines, some people are living for longer before the disease reaches its final stages.*

The symptoms of the final stages of AIDS include:

- extreme fatigue
- rapid weight loss
- appearance of swollen or tender glands in the neck, armpits or groin
- unexplained shortness of breath, frequently accompanied by a dry cough
- infections such as TB and pneumonia
- persistent diarrhoea
- intermittent high fever
- appearance of one or more purple spots on the surface of the skin, inside the mouth, anus or nasal passages caused by a rare cancer, Karposi's sarcoma
- whitish coating on the tongue, throat or vagina as fungal infections take hold
- forgetfulness, confusion and other signs of mental confusion

The incubation period

Fig. 4: Effects of HIV/AIDS (Grade 10, p. 114)

In addition, the textbooks presented the disturbing problems of the world in the present and future such as environmental degradation, the collapse of the ecosystem, the greenhouse effect and global warming, climate change, pollution, deforestation, the effect of acid rain, loss of biodiversity, and extinction of some animal and plant species because of unwise human practices. For example, the future biodiversity loss and extinctions of species involving over time and estimations of the next fifteen years from 2000 on the world stated in Grade 12 biology textbook as:

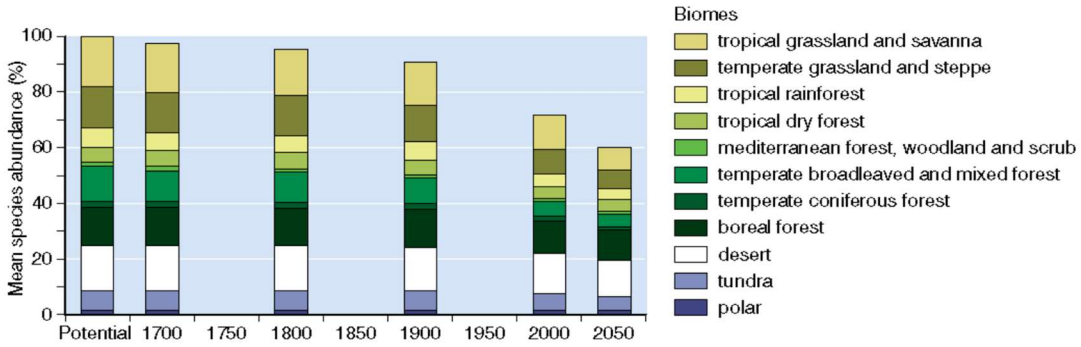


Fig. 5: Future biodiversity loss (Grade 12, p. 54)

Based on the above findings, the textbooks represented dystopian images of global issues; representing the world as a place where many people are suffering from problems of food shortages, pandemic diseases, rapid population growth, environmental degradation, global warming, and loss of biodiversity. However, the textbooks do not narrate enough about the dark sides of technological progress on environmental destruction, overuse of natural resources, and human health. Several researchers argue that environmental degradation, disposal of waste that pollutes air and water, biodiversity loss, overconsumption of natural resources, ecological imbalances, climate changes, and global warming are the results of technological advancements (Alexander, 2015; Dai and Hao, 2017; Kwazo et al., 2014;

& Townsend, 2016). Thus, the textbooks should also present the root causes and effects of technological progress on the problems of global issues such as global warming and environmental degradation in the form of techno-dystopia images to increase students' global awareness from different perspectives.

Future-focused and open-ended activities in the textbooks

School textbooks should incorporate future-focused and open-ended activities that can allow students to evaluate critically and explore alternative solutions for the problems from their points of view (Hoffman et al., 2021; Page, 1996; Paige & Lloyd, 2016; & Pauw, 2021). This study examined how biology textbooks serve these functions.

Table 4: Closed and open-ended activities related to global issues in biology textbooks

Grade	Closed-questions	Open-ended activities				Total
		Anticipate negative future consequences if the existing problems continue as it is	Anticipate positive future consequences if we can use the opportunities to change things	Explore possible future solutions for the existing problems	Action-oriented activities	
9	*51*	*5*	*4*	*7*	*3*	*70*
10	*42*	*10*	*3*	*5*	*5*	*65*
11	*10*	*10*	*3*	*5*	*1*	*29*
12	*142*	*6*	*6*	*7*	*6*	*167*
Total	*245*	*31*	*16*	*24*	*15*	*331*
%	*74%*	*9.34%*	*4.83%*	*7.25%*	*4.53%*	*100%*
Total Closed questions					*245*	*74%*
Total open-ended questions					*86*	*26%*

Table 4 shows that the textbooks included almost, 331 closed and open-ended activities related to global issues. Of these, 245 (74%) are closed-ended questions, and 86 (26%) are open-ended questions. The nature of closed-ended activities is questions that lead students to answer directly by reading the textbooks' notes such as multiple choice, fill blank space, matching, etc. The nature of the open-ended activities included in the textbooks was grouped into four emerged themes. These included 31 (9.34%) open-ended questions that could allow students to explore possible negative consequences of the current problems of global issues if measures could not be taken to stop or reduce the global crisis. For example, the textbooks presented such open-ended questions as:

- *"Identify the most commonly used drug, assess why this is, and look at the effects on the individuals and wider community. (Grade 10, p. 73)"*
- *"Write a short essay on the effects of biodiversity loss (Grade 12, p. 98)"*

Moreover, 16 (4.83%) of the open-ended questions could lead students to anticipate the positive consequences if the world's people could use the existing opportunities to make the world better. For example, such open-ended questions in the textbooks stated:

- "*Write a report on the advancing of biotechnology will influence our lives and help the development of Ethiopia (Grade 11, p. 29)"*

In addition, 24 (7.25%) of the open-ended questions could lead students to explore alternatives of possible future solutions to the problems of global issues. For example, the textbooks state:

- "*How can young people work together to keep themselves and others healthy and free from HIV infection, and help reduce the problems of HIV/AIDS in Ethiopia in the future (Grade 9, p. 169)"*

Furthermore, 15 (4.53%) of the open-ended questions included in the textbooks could encourage students to participate in local actions to solve problems of global issues. For example, the textbooks state:

- *"Plan how you might work with others to conserve an area of land, and what indigenous plants would be likely to grow best near your school (Grade 10, p. 192)"*
- *"Planning a campaign to educate people on the threat of HIV/AIDS (Grade 12, p. 33)"*

The findings show that the textbooks included a few future-focused and open-ended activities that can offer students the opportunity to evaluate problems of global issues critically, explore alternative solutions, make desirable decisions, and take action to solve the problems of the world from their points of view. It can be concluded that more closed-ended activities included in the textbooks have the potential to deepen the techno-utopian and dystopian images of the world in students rather than prepare them as future change agents.

Discussions and Conclusions

The findings of this study show that the textbooks represented both utopian and dystopian images related to global issues. On the one hand, the textbooks emphasize the representations of the techno-utopian image of the world. The textbooks included topics of the applications of biological knowledge to the advancements of biotechnology such as genetic engineering and biogas to solve diverse problems of the world. The techno-utopian image of global issues represented in the textbooks implies promoting techno-optimistic attitudes in students. Danaher (2022); Jeffcote (2003); Alexander & Rutherford (2020); and Barry (2012) described techno-optimism as individuals' beliefs that science and technology can solve the major social, economic, and environmental problems of the world, and trust in the power of technology in transforming society to a better future. Moreover, Danaher (2022, p. 11) proposed four criteria that need to develop a rationally sensible form of 'techno-optimism'. These are statements of the relevant facts (present or future), a value premise that good predominate over bad, a positive evaluation of the facts in light of the value criteria, and the technological premises which state technology can play a key role in ensuring positive outcomes. Therefore, the facts and arguments presented in the textbooks related to biotechnology (see lists in Table 2) fit with Danaher's 'techno-optimism' criteria. For example, the textbooks described there are possibilities to control population growth using biotechnology (contraceptive). It is possible to create a healthy society using biotechnology (medicine and vaccines). It is possible to produce extra food using genetic engineering such as mycoprotein, and modification of animal and plant production through breeding. It is possible to produce trees that can absorb more CO2 using biotechnology to reduce the threat of global warming. Thus, it can be concluded that the positive messages of biotechnologies applications presented in the textbooks have the potential to construct techno-utopian images among students.

However, the textbooks have limitations in presenting the dark sides of technological progress affecting human health, environmental degradation, and global warming. Several researchers, such as Kwazo et al. (2014); Dai and Hao (2017); Alexander (2015); and Townsend (2016) argued that environmental degradation, pollution of air and water, biodiversity loss, overconsumption of natural resources, ecological imbalances, climate changes, and global warming are the consequences of technological progress. They depicted techno-dystopian images that the effects of technology will continue to generate seeds of disasters on the planet Earth in the future. Therefore, the textbooks should also present the dark sides of technology to students, and aware them of such controversies of technological progress. Therefore, these findings can contribute to informing curriculum designers and textbook developers how they should deal with controversies of knowledge of technological aspects in the textbooks to ensure images of global sustainability in students.

On the other hand, the textbooks also represented images of a dystopian world by portraying the world as a place where millions of people are suffering from malnutrition, lack of treatment and die from diarrhea, HIV/AIDS, TB, malaria, cholera, and drug abuse as the major social problems of the world. In addition, the textbooks represented the major global concerns that are negatively affecting lives in the world such as rapid population growth, environmental degradation, the collapse of the ecosystem, the greenhouse effect, global warming, climate change, pollution, deforestation, acid rain, loss of biodiversity, extinction of some animal and plant species. These images of the dystopian world presented in the textbooks related to global issues could have practical and theoretical implications. Practically, dystopian images of the world represented in textbooks have the potential to enhance student's awareness that our world has many common concerns that need global and local efforts to solve the problems. Theoretically, displaying dystopian images of the world in learning textbooks could lead students to construct dystopian images of the problems of global issues by creating worries, and negative emotions, and warning

them how the problems are affecting our present and future lives. Claeys (2017); Nordensvard (2014); Palardy (2018); and Papastephanou (2009) argued that the presentation of dystopian images in textbooks can promote a sense of dissatisfaction with and critical to shortcomings of the social, economic, environmental, political, and technological problems, and display strong emotions of unhappiness, and warn dangerous situations may come unless societies should work to reduce the global problems. Thus, it can be concluded that the negative messages presented in biology textbooks could have the potential to construct dystopian images among students regarding the problems of global issues.

Moreover, integrating merely pessimistic images in school textbooks has the potential to develop pessimistic attitudes and disempowerment among students; unless teachers should cultivate 'response quality' to the pessimistic images (Hayward et al., 2017 & Ramos, 2011) of global issues represented in the textbooks, and promote their ability to explore alternative images of the world through the pedagogic process. Arnaldi (2008) and O'Connor et al. (2007) argue that pessimistic and negative images may lead individuals to narrow down their thinking, develop hopelessness feeling, disempowered in the capacity to affect the future. Previous research results show that most secondary school students had pessimistic images of the problems of global issues, and they felt disempowered to influence the future (Gidley et al., 2004; Hicks and Holden, 2007; Kristof, 1999; & Page, 1996). However, further research should need to determine the impacts of the techno-utopian and dystopian images of the world presented in the textbooks on students' image constructions in the Ethiopian context.

This study also tried to identify the extent to which the textbooks' activities offer students the opportunity to explore possible alternative future images for the problems of global issues critically and creatively from their points of view. The findings of the study indicate that the textbooks included both closed (74%) and open-ended (26%) activities related to global issues. Open-ended activities have four characteristics: activities that offer students the opportunity to explore negative consequences for the existing problems of global issues, explore positive consequences for the existing opportunity of global issues, explore alternative possible future solutions for the existing and emerging problems of global issues, and activities that encourage students to take local actions to solve global problems. However, the textbooks incorporated insufficient open-ended and future-focused activities when compared with the closed-ended questions. Merryfield and White (1996); Page (1996); Jing (2016); and Omidvar & Sukumar (2013) argue that global issues are taught better when the instructional process can allow students to explore the causes, effects, and potential solutions to the problems of global issues. In addition, they claimed that pedagogy of global issues should base on critical pedagogy, task-oriented, issues-centered, and action-oriented, and activities should include in-depth inquiry, more open-ended, future-focused, and reflective practices. However, more closed-ended activities included in the textbooks have implications to lead students to deepen the techno-utopian images and dystopian images of social and environmental problems of global issues and lead them to learn global issues through memorization, and serve more for awareness creations than allow students to evaluate the problems critically, and propose alternative solutions from their viewpoints.

References

Abebe, S.; Brook, L. and Karippai, R. (2013). Knowledge and Attitude of Students on the Environment: The Case of Two Secondary Schools in Harari Region of Ethiopia. *East African Journal of Sciences, 7 (1) 51-58.*

Ahvenharju, S. (2022). *Futures Consciousness as a Human Anticipatory Capacity: Definition and Measurement.* A Phd Dissertation, University of Turku, Finland.

Aklilu, D. (2012). Loss of biodiversity and climate change as presented in biology curricula for Ethiopian schools: Implications for action-oriented environmental education. *International Journal of Environmental & Science, 7(4), 619-638.*

Alexander, S. (2015). A Critique of Techno-Optimism: Efficiency without sufficiency is lost. In "*Prosperous Descent: Crisis as Opportunity in an Age of Limits*". Published by the Simplicity Institute, Melbourne.

Alexander, S. and Rutherford, J. (2020). A critique of techno-optimism: Efficiency without sufficiency is lost. In Kalfagianni et al. (eds.) "*Routledge Handbook of Global Sustainability Governance*". Routledge.

Al-Dughaim, M. (2001). *The Image of the Enemy in Kuwaiti Children*. Ph.D. Dissertation, University College London.

Al-Shuga'a, A.; Yunus, K. and Bashir, I. (2019). Global Issues: The Importance of its Integrating in EFL Classrooms. *Trends in Social Sciences, 1(2), 68-76.*

Anderson, C. (1982). Global education in the classroom. *Theory into Practice, 21(3), 168-176, DOI: 10.1080/00405848209543002*

Angell, A. and Avery, P. (1992). Examining Global Issues in the Elementary Classroom. *The social studies, 83(3), 113-117.*

Anyon, J. (1978). Elementary Social Studies Textbooks and Legitimating Knowledge. *Theory & Research in Social Education, 6(3), 40-55.*

Arnaldi, S. (2008). School, images of the futures and social processes in classrooms. *Futures, 40(9), 795–802.*

Barry, J. (2012). Bio-fuelling the hummer? Transdisciplinary thoughts on techno-optimism and innovation in the transition from unsustainability. In Byrne et al. (Eds.), "*Transdisciplinary perspectives on transitions to sustainability*". Abingdon: Routledge

Bateman, D. (2012).Transforming teachers' temporalities: Futures in an Australian classroom. *Futures, Vol. 44 (1), pp. 14–23.*

Bell, W and Mau, J. (1971). *The Sociology of the Future: Theory, Cases and Annotated Bibliography*. New York: Russell Sage Foundation.

Boulding, K. (1973). *The Image*. The University of Michigan.

Buckland, P. (2016). When all is lost: thrash metal, dystopia, and ecopedagogy. *International Journal of Ethics Education, 1(2), 145–154.*

Calder, M. (2000). A Concern for Justice: Teaching Using a Global Perspective in the Classroom. *Theory into Practice, 39(2), 81-87.*

Chou, P. and Ting, H. (2016). How closely related are the national curriculum and the global dimension? A content analysis of the global dimension in elementary school textbooks in Taiwan. *Asia Pacific Educational Review, 17(3), 1-11.*

Claeys, G. (2017). *Dystopia: A Natural History: A Study of Modern Despotism, Its Antecedents, and Its Literary Diffractions.* Oxford: Oxford University Press.

Cotirlea, D. (2015). Country Image vs. Country Brand: Differences and Similarities. *ECOFORUM, 4(1), 165-171.*

Cruz, B. (1998). Global Education in the Middle School Curriculum: *An Interdisciplinary Perspective, Middle School Journal, 30(2), 26-31.*

Dai, Y. and Hao, S. (2017). *Transcending the opposition between techno-utopianism and techno-dystopianism.* Technology in Society, https://doi.org/10.1016/j.techsoc.2017.11.001

Danaher , D. (2022). Techno-optimism: an Analysis, an Evaluation and a Modest Defence. *Philosophy & Technology, 35(54), 1-29.*

Dator J. (2009). Alternative Futures at the Manoa School. *Journal of Futures Studies, 14(2), 1 – 18.*

Dichter, E. (1985). What's in An Image. *Journal of Consumer Marketing, 2(1), 75 – 81.*

Erfani, S. (2013). Global Issues in English Textbooks: From Initial Attitude to Final Effect. *World Applied Sciences Journal 25 (1), 156-162.*

Finke, R. (1993). *Principles of Mental Imagery*. The MIT Press.

Flouris, G. (1997). Global Dimensions in the Educational Legislation, Social Studies Curriculum and Textbooks of Greek Compulsory Education (Grades 1-9). *Mediterranean Journal of Educational Studies, 2(2), 17-39.*

Gidley, J.; Batemen, D. and Smith, C. (2004). *Futures in Education: Principles, practice and potential*. Australian Foresight Institute, Swinburne University.

Grunig, J. (1993). Image and Substance: From Symbolic to Behavioral Relationships. *Public Relations Review, 19(2); 121-139.*

Gvishiani, J. (1979). *Science, Technology and Global Problems*. Pergamon Press Ltd.

Hanvey, R. (1982). An attainable global perspective. *Theory into Practice, 21(3), 162-167.*

Hayward, P. & Candy, S. (2017). The Polak Game, or: Where Do You Stand? *Journal of Futures Studies, Vol. 22(2), pp. 5–14.*

Heinajarvi, H. (2018). *Accentuate The Positive: Hope as Psychological Capital in Futures Studies.* An MA Thesis, University of Turku, Finland.

Hicks, D. (2003). Thirty Years of Global Education: a reminder of key principles and precedents. Educational Review, 55(3), 255-275.

Hicks, D. (2004). The Global Dimension in the Curriculum. In Ward, S. (eds.) of "*Education Studies: A Student's Guide*". Routledge Falmer.

Hicks, D. (2007). Lessons for the Future: A geographical contribution. *Geography, 92(3), 179-188*.

Hicks, D. and Holden, C. (2007). Remembering the Future: what do children think? *Environmental Education Research, 13(4), 551-512.*

Hoffman, J. (2021). A futuring approach to teaching wicked problems. *Journal of Geography in Higher Education, 45(4), 576–593.*

Hughes, R. and Wheeler, P. (2013). Introduction Eco-dystopias: Nature and the Dystopian Imagination. *Critical Survey, 25(2), 1–6.*

Inayatullah, S. (2008). Six pillars: futures thinking for transforming. *Foresight, 10(1), 4-21.*

Jeffcote, R. (2003). Technology Utopia. *Journal for Interdisciplinary and Cross-Cultural Studies, Volume 3, 1-16.*

Jenkins, T. (2021). *Integrating Strategic Foresight Processes to Improve Regional Planning: Four intuitive scenarios for Wales' regional futures*. MA Thesis, University of Turku, Finland.

Jing, G. (2016). Developing Students' Global Perspectives in Secondary Chinese Classrooms. *US-China Foreign Language, 14(2), 121-128.*

Karvankova, p.; Popjakova, D. and Kovarikova, V. (2015). Global Education or How to Most Effectively Implement Cross-Disciplinary Themes in the Curriculum of Primary School–Czechia´s Example. *Review of International Geographical Education Online, 5(1), 8-25.*

Kristof, T. (1999). *Future Orientation of Young People in International Comparison*. https://www.researchgate.net/publication/284283517

Kroijer, S. (2020). Civilization as the Undesired World: Radical Environmentalism and the Uses of Dystopia in Times of Climate Crisis. *Social Analysis, 64(3), 48–67.*

Kwazo, H.; Muhammad, M.; Tafida, G.; and Mohammed, S. (2014). Environmental Impact of Technologies. *Academic Journal of Interdisciplinary Studies, 3(7), 83-86.*

Lassig, S. (2009). Textbooks and Beyond: Educational Media in Context(s). *Journal of Educational Media, Memory, and Society, 1(1), 1–20.*

Lloyd, D. and Wallace, J. (2004). Imaging the Future of Science Education: the Case for Making Futures Studies Explicit in Student Learning. *Studies in Science Education, 40 (1), 139-178.*

Malthus, T. (1798). *An Essay on the Principle of Population*. Palgrave Macmillan Publishing.

Manniona, G.; Biesta, G.; Priestley, M.; and Ross, H. (2011). The global dimension in education and education for global citizenship: Genealogy and critique. *Globalisation, Societies and Education, 9(34), 443-456.*

Mata, J.; Escribano, C.; Santos, R. and Marolla, J. (2022). Futures education: Curriculum and educational practices in Australia, Spain, and Chile. *Media Education Research Journal, Comunicar, 30(73), 43-52.*

Meadows, D. & et al. (1972). *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind.* Universe Books, New York.

Merryfield, M. (1991). Preparing American Secondary Social Studies Teachers to Teach with a Global Perspective: A Status Report. *Journal of Teacher Education, 42(1), 11-20.*

Merryfield, M. & White, C. (1996). Issues centered global education. In R. W. Evans & D. W. Saxe (Eds.), *Handbook on teaching social studies: NCSS bulletin 93* (pp. 177-187). Washington, DC: National Council for the Social Studies.

Mitchell, W. (1986). *Iconology: image, text, ideology.* The University of Chicago Press, Chicago

MoE (1994). *New education and training Policy*. Addis Ababa, Ethiopia: Ethiopian Federal Ministry of Education.

MoE (2009). *Curriculum Framework for Ethiopian Education (KG – Grade 12).* Ministry of Education, Ethiopia.

MoE (2020). *General Education Curriculum Framework.* The Federal Democratic Republic of Ethiopia, Ministry of Education.

MoE (2023). *Education and training policy*. The Federal Democratic Republic of Ethiopia, Ministry of Education.

Nadeau, J.; Heslop, L.; O'Reilly, N.; and Luk, P. (2008). Destination in a Country Image Context. *Annals of Tourism Research, 35(1), 84–106.*

Nordensvard, J. (2014). Dystopia and disutopia: hope and hopelessness in German pupils' future narratives. *Journal of Educational Change, 15(4), 1-23.*

O'Connor, R. and Cassidy, C. (2007). Predicting hopelessness: The interaction between optimism/pessimism and specific future expectancies. *Cognition and Emotion, 21(3), 596-613.*

Omidvar, R. & Sukumar, B. (2013). The Effects of Global Education in the English Language Conversation Classroom. *English Language Teaching, 6(7), 151-157.*

Ono, R. (2003). Learning from young people's image of the future: a case study in Taiwan and the US. *Futures, 35 (7), 737–758.*

Page J. (1996). Education systems as agents of change: an overview of futures education. In Slaughter, R. (eds.) of "*New Thinking for a New Millennium*", Routledge Publishing, New York.

Page, J. (2000). *Reframing the Early Childhood Curriculum: Educational Imperatives for the Future*. Routledge Falmer.

Paige, K. & Lloyd, D. (2016). Use of Future Scenarios as a Pedagogical Approach for Science Teacher Education. *Research in Science Education, 46(2), 263–285.*

Paju, K. (2021). *Images of the Future of Estonian Education*. MA Thesis, University of Turuku, Finland.

Palardy, D. (2018). *The Dystopian Imagination in Contemporary Spanish Literature and Film.* Palgrave Macmillan, Switzerland.

Papastephanou, M. (2009). *Educated Fear and Educated Hope: Dystopia, Utopia and the Plasticity of Humanity*. Sense Publishers

Pauw, I. (2021). *Envisioning Futures in School Geography*. Vrije Universiteit Amsterdam.

Pingel, F. (2010). *UNESCO Guidebook: Textbook Research and Textbook Revision*. UNESCO.

Polak, F. (1974). *The Image of the Future.* Elsevier Scientific Pubiishing Company, Amsterdam.

Poli, R. (2018). A note on the classification of future-related methods. *European Journal of Futures, Research, 6(1), 1-7.*

Potter, G. (2010). *Dystopia: What is to be done?,* Waterloo: New Revolution Press.

Ramos, J. (2011). Introduction to the Symposium on the Global Mega crisis. *Journal of Futures Studies, Vol. 16(2), 95-104.*

Rosenthal, D. (1985). Global Issues in High School Biology Textbooks. *The American Biology Teacher, 47(8), 459-462.*

Rubin, A. & Linturi, H. (2001). Transition in the making. The images of the future in education and decision-making. *Futures, 33(3-4), 267–305.*

Scotto, G. (2016). The Image of Palestine and the Palestinians in Israeli Textbooks. *Italian Journal of Sociology of Education, 8(2), 225-236.*

Shane, H. (1967). Future Shock and the Curriculum. *The Phi Delta Kappan, 49(2), 67-70.*

Slaughter, R. (1982). *Critical Futures Study and Curriculum Renewal: Implications for Secondary Curricula in England and Wales*. A Ph.D. Thesis, University of Lancaster.

Smith, C. (2010). Education for Sustainability and the Role of Future-Focus Pedagogy, In Zajda, J. (eds.) of "*Global Pedagogies: Schooling for the Future*". Springer.

Son, H. (2013). Images of the future in South Korea. *Futures, 52(8), 1–11.*

Stray, C. (1994). Paradigms regained: towards a historical sociology of the textbook. *Journal of Curriculum Studies, 26(1), 1-29.*

Tikkanen, T. (2016). *Images of the Other in Finnish Primary School Geography Books*. MA thesis, University of Jyvaskyla.

Toffler, A. (1970). *Future Shock*. A Bantam Book, House, Inc.

Townsend, P. (2016). *The Dark Side of Technology.* Oxford University Press.

Ukpokodu, U. (2020). Marginalization of Social Studies Teacher Preparation for Global Competence and Global Perspectives pedagogy: A Call for Change. *Journal of International Social Studies, 10(1), 3-34.*

Vidergor, H. (2018). *Multidimensional Curriculum Enhancing Future Thinking Literacy: Teaching Learners to Take Control of Their Future*. Koninklijke Brill NV, Leiden, the Netherlands.

Wolde, D (2008). The Role of Education in Addressing Environmental Problems and Sustainable Development of Ethiopia. *IER Flambeau, 15(2), 1-38.*

Yerushalmy, M. (2014). Challenging the Authoritarian Role of Textbooks. In Jones et al. (Eds), "*Proceedings of the International Conference on Mathematics Textbook Research and Development*", University of Southampton.