



## EDUCATION FOR SUSTAINABLE DEVELOPMENT FROM THE PERSPECTIVE OF CHRISTIANITY: PEDAGOGIES AND PROSPECTS

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### **Abstract:**

With rising arguments on the fluid idea of education for sustainable development where an established framework is lacking, this review aims to look into the Christian bible for messages of sustainability and how these messages could enhance education for sustainable development in themes and pedagogies. This review examined only the old and new testaments of the bible common to most, if not all Christian denominations. It examined verses with clear connection to sustainability encompassing the environmental, social and economic aspects, particularly the environmental aspect. Discourse analysis of the verses comprising instructions, dialogues and lines of letters was conducted by delving into the historical and sociocultural contexts of the verses to exegete their sustainability implications. This review yielded ten verses with sustainability themes ranging from human responsibilities, ecological value, balance and conservation, responsible consumption and production, conservation of resources, traditional wisdom, equity, social welfare and sustainability to anthropogenic causes of environmental degradation. The main pedagogies for education for sustainable development implicated from this review are problem-based learning, experiential learning, exploratory learning, scenario- and simulation-based learning, reflective learning and deep learning, with specific references to the biblical sustainability themes. This review constitutes one of the very few literature probing sustainability and its pedagogies from Christianity's perspective by qualitatively examining the most pertinent biblical verses. It contributes to the enrichment of sustainability education and pedagogies through religious wisdom. It is crucial in advancing sustainability education in religious studies.

**Keywords:** Bible; education for sustainable development, environment, learning, pedagogy, responsible consumption

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## 1. Introduction

Education for Sustainable Development (ESD) has emerged as an important subset of environmental education to advance the concept of sustainability at various levels. It aims to impart the necessary values, knowledge and skills in relation to sustainable development which would ideally positively alter attitudes towards sustainability (Tang, 2018). Its origin was closely intertwined with the idea of sustainable development which was conceived during the United Nations Conference on Human Environment in Stockholm and coined in Our Common Future Report (Kopnina and Meijers, 2014). ESD revolves around the concepts of intra- and intergenerational equity by addressing the economic, social and environmental aspects of development in an integrated manner. Agenda 21 of the Earth Summit in Rio de Janeiro, 1992 included education as a channel to achieve sustainable development and spurred the development of ESD (Læssøe et al., 2009).

ESD presents an interdisciplinary educational domain which incorporates concepts, issues and strategies of sustainable development. It covers themes ranging from climate change, disaster risk, biodiversity and poverty reduction to sustainable consumption (Agbedahin, 2019; Tang, 2019a; Tang, 2019b; Tang, 2019c; Tang, 2021). It adopts pedagogies similar to other educational disciplines but there is particular emphasis on participatory teaching and learning to yield behavioral changes and garner greater participation of the learners in sustainable development (Christie et al., 2013). To empower learners to act for sustainable development, ESD has conventionally imparted the attributes of critical thinking, teamwork and decision-making based on empirical evidences (Lozano et al., 2019; Tang, 2020a). The Thessaloniki Declaration further differentiated ESD from the broader environmental education with ESD having a clear focus on all facets of sustainability (Wright, 2004). The Thessaloniki Declaration advocated the inclusion of poverty, population, human rights, health, food security and a respect for traditional cultural knowledge under environmental sustainability and called for a holistic approach to ESD by tertiary education institutions. ESD was further refined by the subsequent Lüneburg Declaration made in 2001 which reiterated that globalization, poverty alleviation, social justice, democracy, human rights, peace and environmental protection should be integrated. It urged the operationalization of commitment of universities to sustainability via a “toolkit” (Wright, 2004).

Quality education has been made a Sustainable Development Goal of the United Nations and Target 4.7 is pertinent to ESD. It aspires that all learners will be able to promote sustainable development through ESD (Jan and Jeffrey, 2018). Since its inception, ESD has received much research interest. The research into ESD has taken on numerous paths, namely integration of ESD into the education systems and its challenges (Rauch, 2002; Ashford, 2004; Kamp, 2006), the design of ESD curricula (Lozano & Lozano, 2014), the development of tools and strategies for ESD including the “toolkit” recommended by the Lüneburg Declaration (Wright, 2004), the overall effectiveness of ESD (Nousheen et al., 2020) and the effectiveness of interventions in ESD to name a few.

As one of the aims of ESD is to bring about attitudinal change among the learners, there have also been studies looking into the effectiveness of ESD for this purpose and the psychological perspectives to the oversimplified 'change of attitude' intended (Arbuthnott, 2009).

There have been attempts to comprehend and improve ESD from different angles, particularly from those of education and psychology (Kopnina and Meijers, 2014; Agbedahin, 2019). However, not many studies have been dedicated to examine ESD from religious lenses. Protection of environment is in the doctrines of many religions. There seems to be a consensus in religions that nature is divine and deserves respect. Buddhism for instance, stresses the interconnection and interdependency between natural environment and its inhabitants which is reflected in the concept of karma (United Nations Environment Programme, 2021). Karma, which holds that our future is determined by our present actions resembles the idea of sustainability, which urges us to use our resources wisely in order that the future generations can also have uncompromised access to the resources (United Nations Environment Programme, 2021). Hinduism emphasizes the divinity of nature and the interrelations between living things in its Bhagavata Purana. Islam stands by the notion that humans are stewards of the earth created by God and should refrain from wasteful consumption (Isrāf) (United Nations Environment Programme, 2021). In Christianity, the notion of environmental stewardship is obvious in many parts of the bible (Ezeh, 2015). With ESD viewed from multiple perspectives and the need for its independent presence as an interdisciplinary program still subject to argument, it is of interest to hear what religions have to say.

Jackson (2017) conceded that ESD needs to systematically incorporate diverse perspectives, and shed light into Asian understanding of sustainability and philosophies of ESD. Her commentary gave a philosophical overview of ESD based on few examples of Asian literature which reflect the mainstream Asian insights into sustainability. Ideland and Malmberg (2015) argued that ESD has attempted to instill certain desirable traits among school children through pastoral power urging them to make 'correct' choices for sustainability under the pretext of individual right and freedom of will, much akin to the preaching of salvation in Christianity. The pastoral power mentioned is a metaphor and their article was not intended to examine ESD in relation to Christian teaching. Ezeh (2015) matched the biblical values and Catholic social teaching to sustainable development but did not exegete the pedagogies and improvement for ESD from biblical messages. Museka and Madondo (2012) resorted to the African unhu/abuntu philosophy for ideas of environmental pedagogies suited to Africa. Their work implies that it is possible to search for pedagogical inspirations from cultural and religious philosophies. While it is generally agreed that globalized and diverse perspectives are crucial for ESD, there are few studies which look into how Christian teaching could inspire ESD particularly its pedagogies and further improvement. Having known that ESD aligns with religious values and teachings, it is equally important to apply them in the delivery of ESD to optimize its intended outcomes and impacts.

In this review, Christianity's perspective of ESD is of interest owing to the author's familiarity with the religion. There have been very few articles that resort to religious interpretations to provide greater insight into ESD though environmental protection and sustainable has, in fact, been embedded in many religious teachings. As such, this review serves two aims, i.e., 1) To provide a Christianity's interpretation of ESD, and 2) To draw the pedagogies for ESD from Christian teaching and recommend for the improvement of ESD based on insights from the bible.

## **2. Methods**

This paper examines the Christian perspective of ESD by reviewing the relevant verses in the bible serving as the primary source or reference of Christian teaching. It applies discourse analysis to certain extent, looking into the historical and sociocultural contexts of the verses consisting primarily of instructions, dialogues and lines of letters to understand their perspectives of ESD and the pedagogies adopted or implied in conveying environmental messages (Milton, 2016).

Sustainability centers on the three pillars of environment, economy and society. Excluding any of the three pillars will compromise the idea of sustainability. There is no agreement on the weights of the three pillars but advocates of sustainability generally find that the bottom line lies at equal weights of the three components and attempts to scale down the environmental component would jeopardize sustainability (Agbedahin, 2019). In fact, the equal-weight model has been called a weak sustainability model and a strong sustainability model would see the environmental component expanding to cover the social and economic components which are visualized as its subsets (Tang and Al Qahtani, 2020; Tang, 2020b). In the review of the biblical verses, focus is given to environmental sustainability and any verses with only social or economic implications are excluded.

Christianity holds firmly to God as the creator of all things (Davis, 2009). This review does not automatically equate creation to sustainability unless it is specifically mentioned in the verse that humans assume the role of custodian to God's creation. This review is limited to Christianity with Jesus Christ at its center. As there are various denominations of Christianity, and their bibles may contain different sections in addition to the Old and the New Testaments which are common to the Christian denominations, only verses from the Old and New Testaments have been reviewed.

## **3. Results and Discussion**

Ten verses in the bible have been identified to contain elements of sustainability as shown in Table 1. The background of the verses is also presented in Table 1 and it includes one or a combination of the historical, contextual and sociocultural aspects of each verse. The verses from Genesis to Deuteronomy contain the remarks and instructions made by God in relation to creation, human stewardship of and responsibilities to the earth, provisions

and sabbatical law as portrayed in the biblical books called Torah believed to have been dictated to Moses. The verses from Ezekiel and Isaiah contain prophetic words from divine revelation which bring warnings to the subject for not abiding by the biblical principles. These verses contain messages of resource conservation and sharing, as well as the consequences of not keeping our responsibilities including environmental responsibilities. The verse from Job is a reply of Job in his dialogue with a friend which implies the nature as a source of wisdom and inspiration. The Romans and Philippians are letters from Paul the Apostle to the intended congregations. The verses taken from the letters portray the nature as a source of wisdom, and the concept of equity by taking the interest of others into consideration.

**Table 1: Bible Verses with Elements of Sustainability and Their Background**

<b>Book, Chapter and Verse No.</b>	<b>Verse (Barker and Burdick, 1985)</b>	<b>Background</b>
Genesis 1:26	Then God said, "Let us make man in our image, in our likeness and let them rule over the fish of the sea and the birds of the air, over the livestock, over all the earth, and over all the creatures that move along the ground."	Genesis describes God's act of creating the world including the first humans. Taken literally in relation to environment, humans have been given the mandate by God to rule over all things on earth, including the earth. Rule signals dominion of humans as higher beings compared to other creatures (Davis, 2009). The verse does not provide further information on the concept of 'rule' and other verses need to be referred to give a picture of 'rule'.
Genesis 1:29-30	Then God said, "I give you every seed-bearing plant on the face of the whole earth and every tree that has fruit with seed in it. They will be yours for food. And to all the beasts of the earth and all the birds in the sky and all the creatures that move along the ground-everything that has the breath of life in it – I give every green plant for food." And it was so.	These verses, as a continuation of the above, illustrate human dominion over earth and they indicate that humans and animals were to source their food from plants, specifically plants with seeds such as corn and fruit for humans, and green plants such as vegetables and grass for animals (Keil and Delitzsch, 2014). These verses do not explicitly mention that the early diets were entirely plant-based but they somehow imply that that diets of primarily consuming plants were to be inherited from God in human ruling of earth, especially with the ending of 'and it was so' (Keil and Delitzsch, 2014). Ruling the earth means humans needed to propagate to fill the earth and this is mentioned in Genesis 1:28. The verse does not provide further details on human multiplication. These verses together with Genesis 1:26 establish human stewardship of the earth.

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Exodus 23:10-11	“For six years you are to sow your fields and harvest the crops, but during the seventh year let the land lie unplowed and unused. Then the poor among your people may get food from it, and the wild animals may eat what is left. Do the same with your vineyard and your olive grove.	Exodus details the exit of the Israelites from Egypt where they worked as slaves. This verse is called the Law of the Sabbatical Year commanded by God through Moses (Parry, 1911). The law demands its subjects to leave the agricultural lands fallow after six years of cultivation and permits the poor to get their food from the fallowed lands (Parry, 1911). These verses may not align with modern agricultural practices but it coincides with the traditional practice of shifting cultivation where old agricultural plots are left fallow while new plots are cultivated (Tang and Yap, 2020).
Deuteronomy 20:19	When you lay siege to a city for a long time, fighting against it to capture it, do not destroy its trees by putting an ax to them, because you can eat their fruit. Do not cut them down. Are the trees people, that you should besiege them?	Deuteronomy contains the farewell speeches of Moses which reinstate the laws from God and the importance of keeping the laws. This verse resonates with Genesis 1:29-30 on the significance of seed-bearing plant which fruit-bearing trees mentioned here belong (Poole, 2010). This verse provides a situation-specific instruction on preserving the fruit-bearing trees for consumption (Poole, 2010).
Deuteronomy 22:6	If you come across a bird’s nest beside the road, either in a tree or on the ground, and the mother is sitting on the young or on the eggs, do not take the mother with the young.	This verse emphasizes the kindness to animals and bird is specifically mentioned here probably owing to their economic and ecological importance in the geographical setting characterized by deserts where flies, locusts and mice were common. This unveils more information about how humans should rule the earth (Fausset et al., 1961).
Ezekiel 34:18-19	Is it not enough for you to feed on the good pasture? Must you also trample the rest of your pasture with your feet? Is it not enough for you to drink clear water? Must you also muddy the rest with your feet? Must my flock feed on what you have trampled and drink what you have muddied with your feet?	Ezekiel is one of the major prophetic books illustrating the visions of prophet Ezekiel during his exile in Babylon. It is common in prophetic books to attach figurative meanings to objects where the nation or people intended could be likened as the flock feeding on the pasture and water (Davidson and Streane, 1916). Pasture and water may signify the word of God and execution of justice respectively (Henry, 2005). With figurative meanings aside, the verses comprise rhetorical questions chiding the acts of meddling with or damaging the lower-quality produce and dirtying water

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		by the subjects to which these verses are directed at (Henry, 2005). These acts result in the flock having to feed on the crushed produce and polluted water.
Job 12:7-10	But ask the animals, and they will teach you, or the birds of the air, and they will tell you; or speak to the earth, and it will teach you, or let the fish of the sea inform you. Which of all these does not know that the hand of the Lord has done this? In his hand is the life of every creature and the breath of all mankind.	Job consists of monologues and dialogues of Job, a righteous man who was put through tests. These verses were Job's reply to his friend who came to counsel his grief (Poole, 2010). These verses imply the sovereignty and wisdom of God could be reflected from the creatures around us and the earth we live in. The sovereignty of God is emphasized.
Isaiah 24:4-6	The earth dries up and withers, the world languishes and withers, the exalted of the earth languish. The earth is defiled by its people; they have disobeyed the laws, violated the statutes and broken the everlasting covenant. Therefore, a curse consumes the earth; its people must bear their guilt. Therefore, earth's inhabitants are burned up, and very few are left.	Isaiah is another major prophetic book with the predominant theme on judgment and restoration. As with other prophetic books, these verses contain figurative elements, e.g., defiled by its people could mean permeated by people's wickedness (Henry, 2005). Examined in literal sense, it seems that the earth loses its fertility and vitality as people pollute it through breaking of laws and covenant. One of the laws could be the Law of the Sabbatical Year mentioned in Exodus 23:10-11, in relation to sustainability. The earth's inhabitants will bear the consequences of what they have done and these include being burned up, which might figuratively mean coming under the wrath of God (Henry, 2005; Keil & Delitzsch, 2014). From the perspective of climate change, burning up may relate to global warming and heat waves. There is an indication of the anthropogenic nature of earth's pollution which will eventually work against humans (.).
Romans 1:20	For since the creation of the world God's invisible qualities – his eternal power and divine nature – have been clearly seen, being understood from what has been made, so that men are without excuse.	Romans is a letter in the new testament written by Paul the Apostle on salvation. This verse asserts that external nature which includes the living and non-living things created by God reflects God's attributes, particularly eternal power and divinity, unseen to men (Ellicott, 2015). Therefore, men have no excuse for not understanding these attributes of God (Ellicott, 2015). This verse agrees with Job 12:7-10 on the demonstration of God's characteristics through the nature.

Philippians 2:3-4	Do nothing out of selfish ambition or vain conceit. Rather, in humility value others above yourselves, not looking to your own interests but each of you to the interests of the others.	Philippians is another Paul’s letter in the New Testament with Timothy as a co-author containing expression of gratitude, warning against rituals for salvation and advice on resolving conflicts within fellowship. These verses advise against selfish desire and vanity (Henry, 2005). They encourage the act of humbly acknowledging other people’s strengths and superiority, and this by no means, demands the subjects to put themselves in an inferior position. These verses deter self-centeredness and promote care for others’ interest and welfare (Ellicott, 2015). They promulgate equity and social sustainability.
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The sustainability themes implied from the verses revolve around human rights and responsibilities, resource management, conservation of natural environment, environmental degradation and impacts, equity as well as learning from the environment (Table 2). These themes match with the United Nations Sustainable Development Goals (UN SDGs) of zero hunger, clean water and sanitation, reduced inequalities, responsible consumption and production, climate action, life below water, life on land as well as peace, justice and strong institutions (Table 2) (Jan and Jeffrey, 2018). The pedagogies inspired from the verses and can be adopted for teaching and learning of the sustainability themes are role play, problem-based learning, discussions and debates, exploratory learning, incorporation of cultural and traditional wisdom, scenario- and simulation-based learning, case studies, problem-based learning, reflective learning, as well as probing of cause-and-effect relations (Table 2).

**Table 2:** Sustainability Theme drawn from the Verses and the Pedagogical Implications

Verses	Sustainability Theme	Pedagogy
Genesis 1:26	<p>Theme: Stewardship and responsibilities of humans on earth and the creatures therein.</p> <p>Matching to UN SDGs: Life below water and life on land</p> <p>The responsibilities have not been sufficiently defined but are implied in subsequent verses.</p> <p>One responsibility is related to multiplication of men. Without multiplication, the concept of sustainability particularly intergenerational equity may not</p>	<p>The theme can be imparted through appreciation of the wonder of the nature and probing the responsibilities of human beings as higher beings in conserving the environment.</p> <p>Role play and problem-based learning on managing sustainability could be useful in delivering the theme.</p>



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	hold, and there may not be concerns for carrying capacity exceeded.	
Genesis 1:29-30	<p>Theme: Practicing of predominantly plant-based diets for ecological balance.</p> <p>Matching to UN SDGs: Responsible consumption and production</p>	<p>Delivery of the theme can be facilitated by discussion of the diets that are appropriate for sustainability.</p> <p>Vegetarian diet has been suggested to reduce human ecological footprint but this is still subject to argument. Debate and literature search can be incorporated in teaching and learning, and exploratory learning on formulating sustainable diets and evaluating their sustainability can be adopted.</p>
Exodus 23:10-11	<p>Theme: Allowing lands, particularly agricultural lands to recover through fallowing in order that agricultural activities can be carried out sustainably without straining the fertility of the lands.</p> <p>Matching to UN SDGs: Responsible consumption and production, and zero hunger</p>	<p>The theme can be conveyed through case studies as implied in the verses through a religious practice.</p> <p>There are many cultural practices around the world with similar concept and a study of these practices would also encourage the examination of traditional wisdom globally on sustainable agriculture.</p> <p>The traditional wisdom can be used as a basis to devise modern sustainable agricultural practice, thus presenting an opportunity for exploratory learning.</p>
Deuteronomy 20:19	<p>Theme: Preservation of trees of ecological and food values to ensure sustainable supply of food.</p> <p>Matching to UN SDGs: Responsible consumption and production, and zero hunger</p>	<p>This verse intended as an instruction can inspire scenario- and simulation-based learning where students can be given a real or hypothetical scenario and asked to propose sustainability or conservation plan.</p>
Deuteronomy 22:6	<p>Theme: Protection of animals due to their ecological functions.</p> <p>Matching to UN SDGs: Life on land</p> <p>There is an emphasis on the protection of the reproductive individuals.</p>	<p>As an instruction, this verse can also prompt discussion and formulation of conservation strategies, in relation to problem-based and scenario-based learning. Students can also implement the conservation strategies on campus for instance as part of experiential learning. The experiential learning can then be extended as reflective learning to reflect on the conservation work conducted.</p>
Ezekiel 34:18-19	<p>Theme: Moderation in consumption, conservation of water resources, sharing of resources with others including the poor.</p>	<p>These verses presented as rhetorical questions could inspire debate on ethical issues related to sustainability and discussion on the various models of sustainability during teaching and learning. The latter could prompt a</p>

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	<p>Matching to UN SDGs: Responsible consumption and production, clean water and sanitation, and reduced inequalities</p> <p>The concepts of environmental and social sustainability are evident. This also aligns with the strong sustainability model that environmental protection can contribute to social sustainability.</p>	<p>literature search and review on sustainability models.</p>
Job 12:7-10	<p>Theme: The nature as the source of wisdom.</p> <p>Matching to UN SDGs: Life below water and life on land</p> <p>This is in agreement with scientific investigation of the nature and local knowledge of the environment to enhance sustainability.</p>	<p>This could inspire reflective learning by asking students to observe the nature, note down and share what they could or have learnt from various elements of the nature.</p>
Isaiah 24:4-6	<p>Theme: Anthropogenic causes and impacts of environmental degradation.</p> <p>Matching to UN SDGs: Climate action</p> <p>Humans bear the current and predicted impacts of their irresponsible acts towards the environment.</p>	<p>This presents an opportunity in conveying the cause-and-effect relation. This relation can be learnt through multiple channels such as discussion, mind-mapping, presentation, etc. It also creates the opportunity to teach the concept of predicting and modelling environmental impacts. Besides, it permits problem-based learning where students can be asked to mitigate the impacts identified.</p>
Romans 1:20	<p>Theme: The nature as the source of wisdom.</p> <p>Matching to UN SDGs: Life below water and life on land</p>	<p>Similar to Job 12:7-10, this verse could inspire appreciation of the nature and reflective learning.</p>
Philippians 2:3-4	<p>Theme: Welfare of the other, equity and social sustainability.</p> <p>Matching to UN SDGs: Reduced inequalities, and peace, justice and strong institutions</p> <p>Self-centeredness is an obstacle to sustainability. It is important to acknowledge the rights and strengths of other people (Tang, 2020c).</p>	<p>These verses suggest the instilling of sustainability values during teaching and learning. Attitudinal changes among students are linked to the internalization of the right values. An educational experience that works on the value system of the students would optimize the impacts of a course.</p>

The sustainability themes exegeted from the ten verses in Tables 1 and 2 are in agreement with 'ecotheology' which asserts that the care for God's creation is not an option but a

mandate (Luetz et al., 2018). The failure to carry out the mandate has resulted in the 'creation crisis' we are experiencing today encompassing for instance climate change, mass extinction and environmental degradation (Moo and Moo, 2018). Luetz et al. (2018) argued that the creation crisis is attributed to the biblical concept of sin which implies the anthropogenic nature of the creation crisis and the failure to perform men's responsibilities due to the sin problem. This echoes with Isaiah 24:4-6 reviewed in this article and points out a religious root cause of human irresponsibility and disobedience. White (2010) affirmed the features of human ruling of the earth drawn from the verses which is not to plunder and abuse but to nurture and protect.

Houghton (2007) emphasized the understanding of divinity through the nature and that divinity and the nature are not separate but one. This echoes with the findings of this review that nature serves as a source of wisdom and learning about the nature constitutes an important aspect of ESD. Besides, the oneness of divinity and nature indicates the inherent worth of creation beyond its economic value (Houghton, 2007). Similar to this review, Luetz et al. (2018) highlighted that it is also human responsibility to ensure that the poor communities and vulnerable species are not disadvantaged in our quest for development. Davis (2009) brought up the human obligation of land care in the bible which includes observing commandments, keeping the Sabbath as well as serving and preserving the nature. This matches the biblical instructions on keeping the Sabbatical Year and preservation of trees and animals in Ezekiel and Deuteronomy. The instructions on land care including the Law of the Sabbatical Year also imply the importance of localized knowledge in sustainability which suits the regional land and climatic conditions (Davis, 2009). Therefore, sustainability requires the taking of customary practices and traditional knowledge into considerations.

In terms of ESD, the various pedagogies implied and linked align with the pedagogies adopted or advocated by researchers such as Warburton (2003), Dale and Newman (2005) and Ellis & Weekes, (2008). Christie et al. (2013) conducted a survey on the methods Australian academics adopted in teaching ESD and found lectures, tutorials, critical thinking and discussions were among the most popular ones which reflected low innovative pedagogy in ESD. Few methods such as critical thinking and discussion match with the pedagogies identified in Table 2. Other pedagogies in Table 2 can also serve to inspire more varied and innovative ESD pedagogies among the academics. Another survey by Lozano et al. (2019) among European higher education institutions reveals a more varied employment of pedagogies where the most common ones are lecture, case studies and project- or problem-based learning, two of which appears in Table 2. Supply chain/ life-cycle analysis, mine and concept map, participatory action research and traditional ecological knowledge were adopted to a lesser extent. These approaches are largely similar to Table 2 which states the use of concept map and participatory action research comprising experiential learning through implementing conservation, and reflective learning through reflecting the conservation process and outcomes. Table 2 also includes learning from traditional wisdom. The biblical verses have inspired ESD

teaching and learning beyond lectures and tutorials, and some ESD approaches are practiced in the modern innovative ESD teaching and learning.

Having reviewed the impacts of ESD, and O'Flaherty & Liddy (2018) found that ESD managed to increase the subjects' awareness of global issues, interdependence of environmental components and global responsibility. However, it is questionable whether these awareness and understanding have yielded attitudinal changes which is ultimately what ESD intends to achieve among its audience. These attitudinal changes of the audience are also the objectives of the biblical verses. The results are inconsistent. Arbuthnott (2009) suggested that attitudinal change is multi-faceted and mediated by other factors while Nousheen et al. (2020) found ESD to positively alter the student-teachers' attitudes towards sustainable development. One's attitudinal change is also influenced by his or her value system and Orr (2004) pointed out the lack of value for land and community among graduates nowadays which calls for a change in the ways educators teach and inculcate the values. Targeting one's value system is what the biblical verses aim to achieve among its subjects and Philippians 2:3-4 is particularly evident in advising against selfish desires, arrogance and inequalities which are detrimental to community rapport and development. Besides, the verses have been linked to problem-based learning (Dale and Newman, 2005), deep learning (Warburton, 2003), active-learning (Ellis and Weekes, 2008) and applied learning (Kevany, 2007).

This review is instrumental in revealing the biblical ideas of sustainability and linking them to ESD pedagogies. It shows that the pedagogies drawn and proposed from the biblical verses match well with the pedagogies developed for or employed in ESD. Different from previous studies, this review also discloses the sustainability themes and contents which can be incorporated into ESD through various ESD pedagogies. These contents are inspired by the biblical verses reviewed and could be embedded in ESD generally or ESD for religious studies. The latter could be of interest with increasing emphasis of environmental education in theological studies. It attempts to untangle the concept of human dominion over earth which has been argued to confer exclusive rights to human for exploitation of resources. The biblical idea of dominion and ruling takes on a different perspective.

Despite its significance, this review has certain limitations. It does not claim to have reviewed all biblical verses bearing the concept of sustainability in view of the plethora of verses in the bible. It does not claim to have provided the most accurate interpretation of the verses and exegesis of biblical verses often requires extensive knowledge of the original texts and the sociocultural backgrounds. It may not have covered all the sustainability themes and pedagogical implications from the bible.

#### **4. Conclusion**

This review of the biblical verses on sustainability shows that the verses touch on a wide range of themes, namely stewardship and responsibilities of humans, ecological value, balance and conservation, responsible consumption and production, conservation of

resources, traditional wisdom, equity, social welfare and sustainability as well as anthropogenic causes of environmental degradation. It draws from the verses and recommends pedagogies for ESD encompassing problem-based learning, experiential learning, exploratory learning, scenario- and simulation-based learning, reflective learning and deep learning. It also highlights the need of working on the value system of the learners to make ESD meaningful and fruitful. This review is important in shedding light into the biblical perspective of sustainability and the biblical sustainability themes and ideas which can further enrich ESD, particularly ESD in theological studies which is receiving much interest. Further studies can focus on testing the practicality of the ESD pedagogical ideas inspired by the verses and strategies to introduce them in religious studies.

### **Conflict of Interest Statement**

The author declares no conflicts of interests.

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