A SYSTEMATIC REVIEW ON EDUCATION FOR SUSTAINABLE DEVELOPMENT: ENHANCING TVE TEACHER TRAINING PROGRAMME

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ABSTRACT

As the call for the advancement of TVET deepens, and as skill requirement for vocations transcends traditional job requirements due to technological advancement and innovation. It becomes imperative that workers in the industrial and vocational ambits of nations develop the requisite skills and capacities for work in the 21st century that adheres to sustainable standards and meets market needs also. Thereby, contributing to societal wellbeing and community development. To achieve this goal, teachers in Technical and Vocational Education (TVE) have a crucial to play as they will be responsible for the training of workers and developing their skills and capacities for work necessary to improving societal well-being and community development. The challenge is that technical and vocational teachers are not being trained to develop capabilities for Sustainability. Using a systematic literature review, this paper critically examines the extant literature on education for sustainable development and provides a synthesis of the literature in identifying the shared message that SD and ESD models attempt to represent. Furthermore, the paper discusses the factors that foster societal well-being and community development through an ESD perspective. Conclusively emphasis is paid on the unique and significant role that technical and Vocational teachers can play in contributing towards the transition to sustainable development. Consequently, this paper culminates with an analysis of the various ways TVE can help contribute towards societal wellbeing and community development if SD is rightly integrated within TVE teacher training programs.

1. INTRODUCTION

The Sustainable development (SD) initiative is the result of deep reflections of the existential problems of humankind which also is a consequence of issues such as the overexploitation of natural resources and the promotion of economic development at the expense of environmental and ecological quality (Fien & Maclean, 2000; Fien, Maclean, & Park, 2008; Fien & Wilson, 2005; Majumdar, 2009). Today, Sustainable Development has become the guiding principles with which human development is weighed upon (Keiner, 2005) at least for some developed nations and for others it has become the ideal "word" for development that is not feasible (from an anthropocentric c perspective). Fundamentally, the overarching goal of Sustainable Development is to promote environmental, social and economic sustainability in a way that all three dimensions are approached in equilibrium while taking cognisance of the cultural context of the locale (Diesendorf, 2001).

The most common definition of SD has been "the development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland, 1987; UNESCO, 2006b; United Nations Educational Scientific and Cultural Organization, 2005). While this definition emphasises the fundamental principle of achieving equity between the present and future generations, there is no disagreeing that other description of the term Sustainable development exist and offers a similar but varied interpretation of the concept. However, it is not the goal of this paper to compare and juxtapose the varied interpretations of SD at this point. The purpose of this paper is to substantiate how Education for Sustainable Development (ESD) can help improve societal well-being and community development while also iterating the importance of integrating ESD within Technical and Vocational Education and how the intersection between both fosters societal and community development. These we would explore through a critical review of the extant literature on ESD.

As a starting point, we choose to offer our conceptualisation of the terms societal wellbeing and community development by exploring how they have been defined in the literature. Societal well-being is described as a state in which the basic human needs are met and people within a community are able to coexist peacefully with equal opportunities for their advancement (Keyes, 1998). Similarly, Cavaye (2006) describes community development as a process facilitated by community members where local people not only create more jobs, income and infrastructure but also help their communities become better at and capable of managing change. We opine that societal well-being and community development can be successfully fostered within a society or community when the principles of Sustainable Development have been embraced and imbibed within such community. A point we intend to buttress with supporting ESD literature. The Sustainable Development goal has been promoted by world organisations such as UNESCO, the OECD, the World Bank etc, through various initiatives, policies, regulations and awareness programs (Underwood, 2002; UNESCO, 2006a, 2012). This has been promoted world over with the view that enacting sustainable development goals would help reduce the effects of decades of unsustainable practices and activities which have resulted in the numerous issues we now face globally. These effects have resulted in issues which are being experienced world over such as climate change, global epidemics in the form of wars, conflicts between nations as well as natural disasters, environmental degradation, resource depletion, pollution, poverty, inequity etc (Fien & Tilbury, 1996; Majumdar, 2009; Reid & Petocz, 2006; United Nations Educational Scientific and

Cultural Organization, 2005). Irrespective of these policies, regulations and initiatives centred on reducing environmental challenges and the issues resulting from unsustainable human practices, not much has been achieved (Cebrián, Grace, & Humphris, 2015). Research literature (Sivapalan, 2016; Sleurs, 2008; Zolkifli, Kamin, Azlan, Yahya, & Z., 2016) has shown that these initiatives do not necessarily drive and sustain the needed impact for Sustainable Development. Perhaps a more pragmatic approach is required since the fundamental goal of Sustainable Development is to develop within nations a sustainability literate and conscious citizenry. The idea behind this line of thought is that a sustainable conscious citizenry would be able to live sustainable lifestyles and be cautious in their relationship with nature and this collective responsibility and practices can be consolidated to reduce the negative impact humans have had on environmental and ecological systems.

To develop a citizenry that is capable of living in harmony with nature and that does not impose unbearable and unsustainable burdens on nature (the ecosystem), it is important to empower people with the knowledge, skills, values, dispositions and capabilities required to do so. Leaders world over have agreed that it takes education to develop these knowledge, skills, values and dispositions required for Sustainable Development. Hence, Education for Sustainable Development (ESD) becomes important and crucial to attaining the SD goal of raising a sustainable literate and conscious citizenry. ESD has been declared the priority of priorities in the quest to transition nations towards sustainable development (UNESCO, 2005). Consequently, the (UNESCO, 2005) explains that ESD should be considered a major influencer in achieving the SD goal.

Education for Sustainable Development (ESD) is a transformative learning process that equips students, teachers, and school systems with new knowledge and ways of thinking needed to achieve economic prosperity and responsible citizenship while restoring the health of the living systems upon which lives depend on (Cloud Institute for Sustainable Education, 2016). Similarly, the New Zealand Ministry of Education (2015) describes education for sustainability as learning to think and act in ways that will safeguard the future and wellbeing of people and our planet. UNESCO (2006c) also conceptualises ESD as a means of empowering students to develop the knowledge and understandings, skills and attributes needed to work and live in a way that safeguards environmental, societal and economic well-being, both for present and future generations. ESD is thus very pertinent and central to attaining sustainable development. there has been a call for various fields and disciplines outside the field of environmental education to incorporate ESD into the core of their programs, and as educators in various fields begin to respond to this call steadily, there is the question of what importance does ESD hold for Technical and Vocational Teacher training programs? What meaning can we make from the various SD and ESD ideologies and perspectives? Can ESD foster societal wellbeing and community development. These are the questions we seek to answer by exploring the extant ESD literature. More specifically, our review was guided by six research questions;

i.   What shared message can we infer from the various models and ideologies of SD and ESD?
ii. What factors contribute to societal wellbeing from an ESD perspective?
iii. What factors contribute to community development from an ESD perspective?
iv. What does the literature say about teacher's roles as change agents for ESD?
v.   Can ESD integration into Technical and Vocational Education programs foster societal wellbeing and community development?

2.   METHODS

The review strategy employed in this paper was that of a systematic literature review. The systematic literature review offers organised and systematic procedures for critically analysing research studies (Petticrew & Roberts, 2008; Pickering & Byrne, 2014). Evans, Stevenson, Lasen, Ferreira, and Davis (2017) also explains that a systematic review process enables researchers to utilise transparent review procedures to source for, evaluate, analyse and synthesise the results of relevant research well in advance to ensure that the exercise can be repeated and replicated. We applied this approach to primarily explore the perspectives and ideologies in the models of SD and ESD and what shared meaning (if any) they hold for educators. Furthermore, we sought to answer questions that relate to how ESD can be used to foster societal wellbeing and community development using Technical and Vocational Teacher Education program as a tenet for this exploration. We retain that while the systematic review approach offers explicit methodological procedures to produce a synthesis of evidence, however, we acknowledge our own subjectivities in interpretation and the limitations resulting from the information provided or otherwise omitted by the authors of the research papers.

2.1   Article sources

We are aware that ESD is a particularly broad area of study with several aspects of discourse, and because we wanted to ensure that data sources reflecting the questions for the review were covered we chose to utilise the following databases in our search-Scopus, Web of Science (WoS), JSTOR and Eric. Our choice of these databases was because we were exploring ESD from a niche area, that is within Technical and Vocational Education as well as the intersection between the ESD literature, social well-being and community development. We also found that these databases have helped scholars who carried out systematics reviews on ESD, so we chose to retain these databases in our search for research articles. Our initial search using the keyword- "Education for Sustainable Development" returned hundreds of thousands of research paper across the databases. But since we were not just interested in ESD alone, but its intersection with other areas such as Technical and Vocational Education, societal well-being, community development as well as ESD and SD models, we, therefore, utilised a much more focused search string across the databases. Our search strings were; "Education for Sustainable Development" AND "societal well-being" OR "community development" OR "vocational education" OR "Sustainable Development Models"; "SD Models" and "ESD models". We allowed the search to include peer-reviewed journal papers, book chapters, and research reports.

2.2   Article selection and screening

Using the search strings in the preceding section returned a total of 240 resources across the four databases (Scopus 34, WoS 49, Eric 94, and JSTOR 63). We then screened these results to exclude duplicates, articles not related to any of the six guiding questions for the review, as well as ESD articles that were not relevant to the review in the sense that they explored other issues, not within the scope of our review. This we did by analysing the paper titles, author keywords as well as abstract. This resulted in a total of 33 papers that were retrieved for in-depth reading and consideration. Finally, a total of 19 publications were retained for full review and synthesis

2.3 Analysing the articles

Articles relating to each of the guiding questions for the review were consolidated to produce a synthesis of evidence-based conclusions. Thereafter we provided our own submissions of the questions asked. These were then further discussed vis-a-vis a direct comparison with the submissions of the authors in the selected research papers.

3. RESULTS AND DISCUSSIONS

3.1 What shared message can we infer from the various models and ideologies of SD and ESD?

To answer this question, we began by analysing studies that described models of sustainability or and Education for Sustainable Development and then we produced a synthesis of these models, their corresponding ideologies and approaches. Thereafter we made attempts to determine whether there are any shared or mutual messages that can be inferred from these models or whether the various perspectives depicted in the models can be consolidated.
A model is described as a systematic approach used to achieve a specified goal or result and it offers a description of the cohesive and consistent (scientific) iteration of the approach that leads to the desired result or goal (Van Bon, de Jong, & Pieper, 2008). Models are comprehensive tools that help us gather, analyse and share information (Madhavi, Shailaja, Gopal, & Keren, 2007). They help in communicating explicitly an intended objective. They are also means for communication between policymakers and researchers. These descriptions offer a conceptual definition of what models are used for and how they are created and developed. Models of sustainability are thus aimed at providing an understanding of sustainability from various viewpoints as conceptualised by different scholars. The following are descriptions of some models of sustainability

3.1.1 The three-pillar basic model

The three-pillar model of sustainability is a triad between three sustainability dimensions; environment, society and economy, with an emphasis on the society. Scholars describe it as the most basic sustainability model as it emphasises equity in human societies without taking cognisance of the human quality of life (Madhavi et al., 2007). Its approach to sustainability is one that emphasises at least one of the three basic building blocks of sustainability. It can be viewed as an intersection of three circles with each circle representing each dimension or as a structural model as shown in Figure 1. The model simply takes the dimensions of "environmental, social and economic resources" and labels them as requirements or preconditions for sustainable development. in this model, sustainable development is achieved when all dimensions work in unison and in synergy. Although some scholars (Thatcher, 2014) have argued that the model does not take cognisance of the interactions that exist between the dimensions of sustainability, rather each dimension of sustainability is treated as an independent entity in a triad relationship that must exist for sustainable development. the is also the argument that the model does not incorporate a time component which is a critical feature of the definition of sustainable development given at the World Conference on Environment and Development (WCED) held in 1987, where it was

stated that present needs must not compromise future needs. Irrespective of these valid criticisms of the model, at the very least, the model has identified three critical dimensions for sustainable development. This identification can be built upon by subsequent models which could further explore the interactions between these dimensions and how they can be better understood when viewed in tandem with the principles of sustainable development.
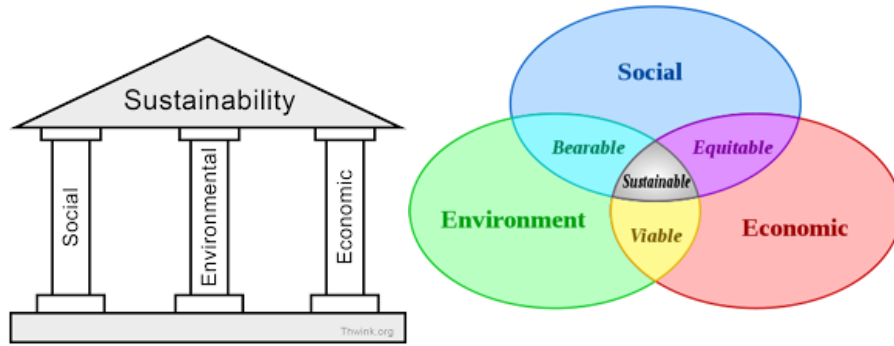

Figure 1: A Three-pillar basic model of sustainability (source: www.thwink.org)

3.1.2   The egg of sustainability

This model was designed by the International Union for the Conservation of Nature (IUCN) in (1994). Their approach to sustainability depicts that sustainability can be likened to an egg, with the yolk and egg white all enclosed under the shell. This analogy was used to depict the relationship between the ecosystem and people. With each enclosed within a system and with each also dependent on each other. A society is said to be sustainable if the interactions between the ecosystem and the people are both balanced and interdependent (Guijt & Moiseev, 2001). The ecosystem is viewed as the system with which the interactions between other dimensions depends on. Therefore, a society is deemed well and sustainable only if people and the ecosystem are well and healthy. Hence in this model, more significance or weight is given to the ecosystem (environment) than other dimensions of sustainability. The argument is that social and economic development can only take place if the environment provides the necessary resources for such development. Therefore, the ideology behind this model of sustainability, is that because the ecosystem is a coordinated system with which other entities or dimensions of sustainability depends on, then if there is a balance between the ecosystem and other dimensions of the system in such a way that the ecosystem dictates the level of control over the number of resources expended, then sustainable development can be achieved.
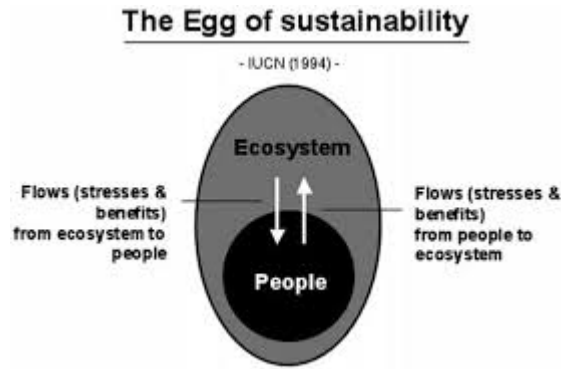
Figure 2: IUCN'S egg of sustainability (Source: IDRC, 1997)

3.1.3   Atkisson's Pyramid Model

Atkisson's pyramid model of sustainability takes a more problem-solving approach in its view of sustainability. The model supports and accelerates progress and development through an iterative process of first identifying sustainability visions, then proceeds through a process of analysis and brainstorming, after which agreements based upon a credible plan of action are reached. The pyramid structure sets out procedures that guide through the process of first building a firm foundation of understanding, searching for and collecting relevant information and ideas, and then focusing and narrowing down those ideas to what is important, effective, doable, and something that everyone can agree upon (Madhavi et al., 2007). Atkisson's pyramid models constitute a strategy for SD and its five hierarchical levels include;

    i.   Level 1: Indicators- Measuring the trend (What is happening?)
    ii.   Level 2: Systems- Making the connections (Why is it happening?)
    iii.   Level 3: Innovations- Ideas that make a difference (What can we do?)
    iv.   Level 4: Strategies- From ideas to reality (How do we do it?)
    v.   Level 5: Agreements- From workshop to real world (Actions) (Let's do it).

The model depicts a group decision-making process that is designed to facilitate understandings of sustainability and help people move up the learning curve, that begins from identifying the fundamental principles to system analysis, then to innovative strategies for action. Moving up the ladder, groups then practice cross-sectoral teamwork, make linkages and generate a pool of new ideas and work towards reaching a consensus- indicating a set of actions they have agreed upon to incorporate into the real world (Pearce, Hamilton, & Atkinson, 1996).

These three models do make valid attempts to contextualise sustainable development and make it tangible, however, these models have little significance to educators, who are supposed to answer the question of what ESD learning outcomes do we seek to achieve in our programs, as well as how do we teach these identified SD concepts and principles. Models are supposed to serve as guides towards achieving specific results and help in understanding a hypothetical situation thoroughly. These models have succeeded in doing one thing and that is, presenting different viewpoints of the sustainable development agenda and how the latter have been conceptualised by different people and organisations with a keenness to the sustainable development dimensions they seek to promote and develop.

One key message that can be depicted from these models is that three broad dimensions of economic, social and environmental factors must interact in some way to achieve sustainable development. Therefore, what is the place of education in sustainable development?

It has been emphasised that education plays a critical role in sustainable development. Education is a lifelong process that enacts the betterment and quality of human well-being can be fundamentally used to reshape the relationship humans have with nature for the purpose of promoting the health and wellbeing of people and sustenance of the planet. According to Shohel and Howes (2011), there are three known approaches to Education for sustainable development, they are; education about sustainable development, education for sustainable development, and critical education towards sustainable development.

Education about Sustainable Development (SD) is primarily aimed at developing a knowledgeable individual. Some scholars argue that this approach focuses on cognitive knowledge and since cognitive knowledge does not necessarily lead to a change in behaviour, little should be expected from learning that is centred on education about SD (Shohel & Howes, 2011). The second model, education for SD centres on practical and contextualised learning about how to live a better life and how to care for the present and future of the earth (Openg, 2012). Some scholars view this approach as an approach intended to enhance the way the ecosystem is maintained. The ecosystem is an umbrella for the other sustainability dimensions; such as social, economic and environmental dimensions.

Critical education towards SD which is the third ESD model particularly focuses on building human capacity to think and act critically in relation to sustainable development goals. These all have potential strengths as well as limitations for use within a school system. However, it may be argued that they lack rigour and explicitness in answering the question 'what learning outcomes do teachers pursue with respect to ESD' particularly technical and vocational teachers and also how these can and should be taught. Hofman (2015) opines that humans expect nature to adapt to our way of life when it should be humans adapting our way of life to protect nature since it offers us our source of livelihood and much more. This way of thinking is probably responsible for the way people relate with nature and perhaps the notion held by some educators that there is no substantial threat to our ecosystem and as a result, there is no fundamental reason to change the way we teach. Some vocational educators believe ESD has no substantial place in Technical and Vocational Education for the reasons that ESD does not provide vocational students with labour-sensitive skills that are demanded by industries (Sharma, 2009). Despite this notion being very erroneous, there is fundamental truth that vocations need to incorporate the principles of sustainable development to redefine how work is carried out, and this will no doubt require transformation that is compliant with the principles and goals of sustainable development Therefore, having discussed the inconsistencies in the ideas presented by these SD models and frameworks as well as their limitation in providing adequate answers to the fundamental questions vocational teachers ask,-how do we teach sustainability concepts within our vocational subjects? and what learning outcomes should our lessons focus on with regards to SD? The following section will attempt to answer the questions relating to social well-being and how TVE can help in fostering and achieving the latter and promote community development through the integration of ESD.

3.2   What factors contribute to societal wellbeing from an ESD perspective?

Recall that social wellbeing has earlier been defined as a state in which basic human needs are met and people within a community are able to coexist peacefully with equal opportunities for advancement (Keyes, 1998). Social wellbeing constitutes social equality, social capital as well as social trust. These three elements are responsible for the interplay between several other sub-elements which necessitates that a society has the needed tools with which such society can function effectively while promoting values centred on peace and social equality (Aked, Marks, Cordon, & Thompson, 2008). It can be summed up that social wellbeing can be mostly fostered by inculcating a culture of values education specifically aimed at improving the quality of life of people, leading to happiness and life satisfaction (Aked et al., 2008). Figure 3 shows a concept mapping of social wellbeing and its relationship to certain factors, determinants and components. This was developed by the researcher from a synthesis of the literature. While social wellbeing is needed to resolve conflicts, create sustainable livelihoods and promote peace, it is also an antidote to crime, stigma, racism and violence. It is dependent on the beliefs, value system, social inclusion and participation, as well as lifestyles of a group of people with shared identity and culture within a society (Aked et al., 2008; World Health Organization, 2001). While the literature also reports several approaches to attaining social wellbeing especially from a psychological and mental health perspective, social wellbeing can also be better achieved and promoted by education for sustainable development. ESD has been defined by the New Zealand Ministry of Education (2015) as learning to think and act in ways that will safeguard the future and wellbeing of people and our planet. The factors which promote social well-being in a society are evident in the principles promoted by sustainable development. Therefore, educating for sustainable development may also inculcate these values which promote social wellbeing.
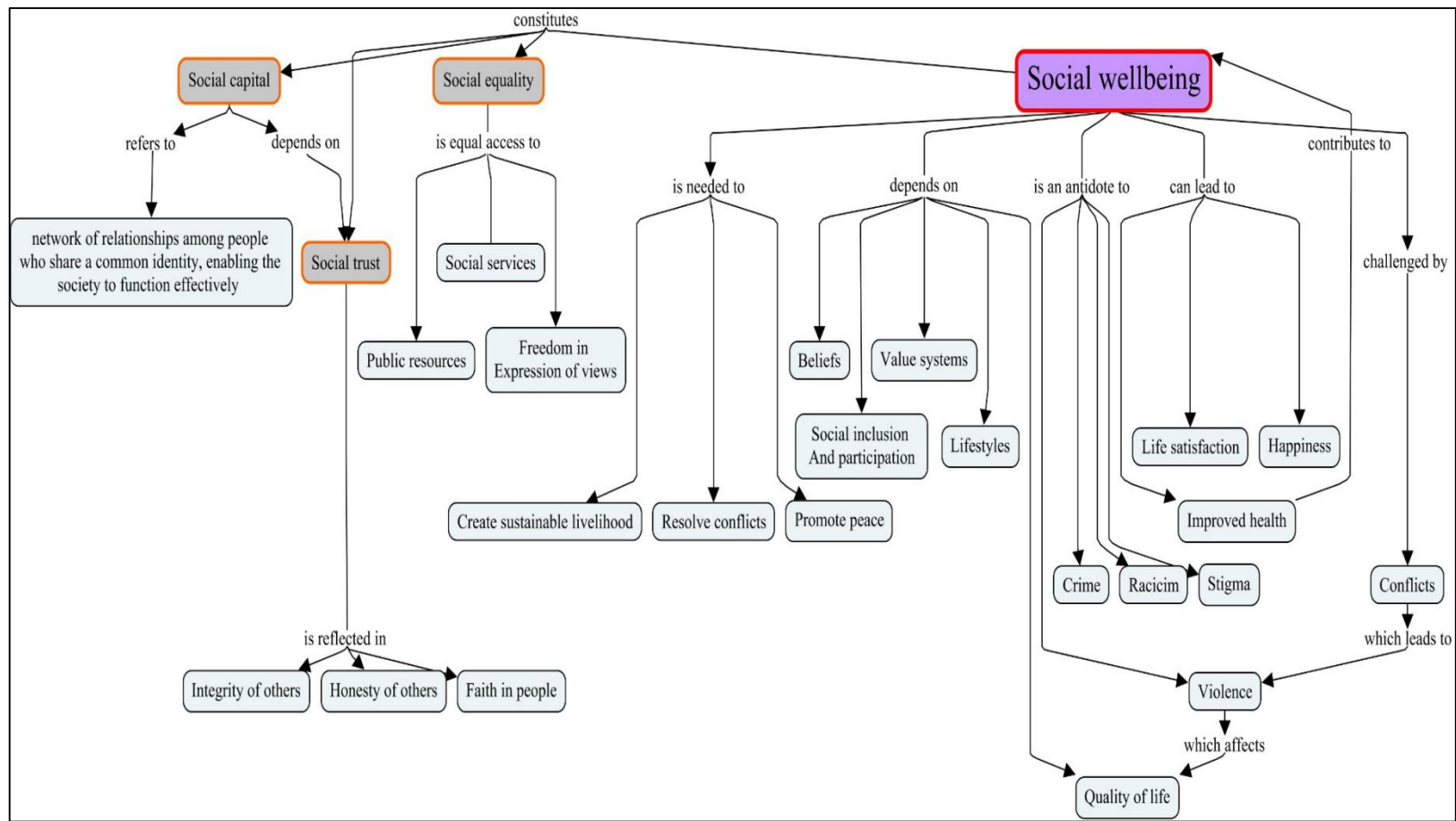
Figure 3: Concept Map showing the factors, relationships, determinants and Components of Social Wellbeing

3.3   What factors contribute to community development from an ESD perspective?

Community development according to Christenson and Robinson (1989) is a process whereby a group of people within a society or community reaches a decision to initiate a social action process to change their economic, social, cultural and environmental situations. Similarly, Phillips (1992) opines that it is a process that increases choice where people within a community can exercise their full potentials to lead productive and creative lives. Community development can occur when people within the said community believe that working together can make a difference, thereby collectively and mutually addressing their shared needs and interest for the benefits of the community (Flora, Flora, Spears, & Swanson, 1992). Biggs (1999) explains that it involves a process that begins with identifying the community's problems and opportunities and then assembling the community's resources, skills and relationships to build on the identified strengths of the community. Community development and social well-being can be likened to two sides of the same coin because both promote progress within a community. From the above descriptions of community development, it can be inferred that the later depends on the commitment of the community, resources, skills and relationships that can all be harnessed for the sole purpose of improving the economic, social, cultural and environmental conditions of the community.

Recall that SD is structured into three major dimensions, i.e. the economic, social and environmental dimensions all within the cultural context of the locale it is applied to. Therefore, if community development is fostered to improve the economic, social, cultural and environmental conditions of a community, education for Sustainable development could very well play a better role in achieving this goal since it is structured to bring about the education of individuals in terms of developing the knowledge, skills and competencies necessary to live sustainable lifestyles and create sustainable livelihoods. While community development may take on traditional approaches in fostering this progress for a community, ESD, on the other hand, takes a more pragmatic approach in educating individuals within communities to develop skills and values that also promotes sustainable progress and development. Instead of just deploying members of a community to come together in times of need, these community members can be exposed to SD concepts and ways of thinking that better prepares them to tackle identified community problems in sustainable and more efficient ways. But this cannot be attained if ESD is not holistically integrated into school systems and if teachers as agents of change are not trained and prepared to take on this role of educating for sustainable development (Abdulrazak & Ahmad, 2014; Ahmad, 1998; Bayani, 2010; Bosselmann, 2001).

3.4   What does the literature say about teacher's roles as change agents for ESD?

Teachers are no doubt crucial and fundamental to any change process. They influence the outcomes of change processes in some degree or dimension. The Zambian Ministry of Education National Implementation Framework III: 2011-2015 reports that *"the quality and effectiveness of the education system depend heavily on the quality of its teachers. Teachers are key persons in determining success in meeting the system's goals. In view of this, the calibre of teachers and the status of the teaching profession are of paramount importance. The educational and personal well-being of learners in schools, thus, hinge crucially on teachers' competence, commitment and resourcefulness".* This speaks of the role teachers play in effecting change within their community, institutions, educational systems and learning spaces. According to Perraton, Creed, and Robinson (2002) teacher education generally constitutes four elements: improving the general educational background of the teacher trainee; increasing

their knowledge and understanding of the subjects and concepts they are to teach; exposing them to the pedagogy and theories of learning; and developing their practical skills and competencies.

As agents of change for the ESD agenda, teachers must be trained to develop understandings for Sustainable Development, develop the pedagogies and competencies for teaching sustainability-related concepts. Bass and Stogdill (1990) define an agent of change as a person or an individual whose act, actions, lifestyles influence others positively and cause them to act in a similar manner. Teachers are no doubt influencers within the educational systems, if therefore a teacher is exposed to the fundamentals of what ESD entails, such a teacher would be better prepared to undertake the task of being a change agent within the school system and community. Teachers as agents of change have been discussed within the overall context of education. But why are Technical and Vocational Education (TVE) teachers particularly relevant to the SD agenda? Research literature has revealed that TVET can be a very important medium to reach out to a whole lot of workers and develop their knowledge, skills and values about SD, since TVET is a major supplier of the total workforce of nations (Hofmann & Strietska-Ilina, 2013; Marsden, Medhurst, & Irving, 2013; Sivapalan, 2016; UNESCO & ILO, 2002; United Nations Educational Scientific and Cultural Organization, 2002; Zolkifli et al., 2016). The major implication is that TVE teacher training programs have the important task of reorienting their teacher training programs to reflect SD principles and integrate important SD concepts into the curriculum, so as to enable these teachers who would in turn train vocational technicians and workers in various occupations and vocations to become capable of inculcating these SD values, knowledge and understandings.

3.5   Can ESD integration into Technical and Vocational Education programs foster societal wellbeing and community development?

As much as teachers are recognized as central to the sustainable development agenda, it was not until recently that the important role TVET plays in such regards was recognized. Gough (2009) reports that recommendation 14 from the Tbilisi conference stated that *"the curricular of those undertaking technical and vocational education should include information on environmental changes that results from the sort of work they will do and that emphasis should be given to TVE with regards to;" (i) environmental applications for workers in each vocation, (ii) the collective effect of related vocations upon the environment*. Despite the many international forums and caucuses that had taken place over the past few years, the literature still records a low response to the call for ESD integration in TVET (United Nations Educational Scientific and Cultural Organization, 2008), especially in the training of TVE teachers. In the words of some scholars, some TVE educators see ESD as an irrelevant addition to the already overcrowded curriculum or the perception that there is no demand for SD skills and competencies from industries as held by other TVE educators, as well as issues regarding sustainability not being a mandate for TVE teacher training institutions (Gough, 2009; Sharma, 2009; Zolkifli et al., 2016). At a time when the necessity for ESD integration in TVE has continually been emphasised and re-iterated by UNESCO-UNEVOC and other leading organisations and scholars, it leads one to ask the question why are TVE institutions not responding to this call despite the vivid emphasis on the subject. Reflective analysis of the literature reveals that there is still a vague understanding of what ESD entails, what its goals are and how it should be pursued within TVE institutions (Brown, Sack, & Piper Rodd, 2013; Effeney & Davis, 2013; Essel, 2013; Evans, Whitehouse, & Hickey, 2012; Zolkifli et al., 2016). Perhaps, a re-emphasis of the benefits ESD holds is required as well as discussions about why it is an absolute necessity for TVE.

Technical and Vocational Education according to Thompson (2002) aims at developing human capacities in terms of the knowledge, skills and understandings required to enable them to function effectively in their chosen vocations. From Thompson (2002) descriptions of TVE, we can understand that one of the fundamental purposes of Technical and Vocational Education is to prepare individuals for economic life and gainful employment in a specific vocation or occupational area. Research has shown that human activities and the way in which work and operational processes are carried out impacts upon the environmental and social challenges which we face, which in turn necessitates the need for sustainable development. In order words, the practices and activities of workers and vocational professionals have a great influence on not just the economic implications for nations but also impacts upon the social and environmental systems. Imagine that the training of Technical and Vocational professional empowers them with knowledge, skills and capabilities to approach work in sustainable ways, perhaps there may be a significant reduction in the social, environmental and economic challenges we face today, since TVET accounts for most of the workers across nations (Hofmann & Strietska-Ilina, 2013; Majumdar, 2005; Unesco & Ilo, 2001).

Research and experience have shown that the traditional methods and ways in which workers carry out work processes and operations have some negative impact on the environment. The environment which is a complex interplay of the social, economic, and cultural dimensions of nations is affected in some way when and if we continue to engage in such work processes, practices and actions that have led to this massive deterioration of our ecosystem. To retrace our steps and correct our actions so that it is reflected in the way we work and the way we live, it is necessary that we unlearn those conventional ways of living and working we are used to and have been practising and develop sustainable and healthy practices instead. This is why education for sustainable development was conceptualised. Its purpose is to create a level of awareness of the environmental, social and economic issues that arise from engaging in unsustainable practices and inculcate SD skills, knowledge and values

Vocational academics and educators seem to be more concerned with what benefits ESD hold for Technical and Vocational Education. In our opinion, we do not share this view. We do not believe that ESD stands to benefit any academic field of study, rather we believe that it stands to benefit the entire human race as its principles are founded on the sustainability of our planet- (including earth's resources, human wellbeing, etc.), therefore we believe that rather than ask what benefits ESD have for Technical and Vocational Education, a more crucial question would be what role TVE can play to contribute towards sustainable development? UNESCO (2006b) reports some of the crucial role TVE can play in the transition towards sustainable development. The report explains that Technical and Vocational Education through lifelong learning can help transition nations towards sustainable development by becoming the tool for the promotion and realisation of the objectives of a culture of peace, the international citizenry, social cohesion and environmentally friendly culture. This can be done by reorienting TVE curriculum by incorporating important sustainable concepts that are fundamental to developing individual capacities to respond to the social, economic and environmental; challenges societies face, thereby contributing to the societal development and community integration. The report also emphasises that TVET of the future must not only prepare individuals for employment but must also develop them into responsible citizens who give due consideration to preserving the integrity of their environment and the welfare of others.

Now if ESD can be successfully integrated within TVE teacher training programs. The implication would be that TVE teachers would have acquired the requisite skills and competencies in disseminating ESD related content to their students who would, in turn, carry on these practices as vocational workers, technicians and craftsmen upon gainful employment.

Further implications would be that workers in the ambit of Technical and Vocational workforce while imbibing the values, knowledge, behaviours and understandings that underpin sustainable development, would significantly contribute to sustainable living and the negative impact of work processes on our ecosystem would have been significantly reduced. Since the principles of ESD reflects peace, equity, as well as empowers sustenance and economic well-being, if these principles are adequately integrated within TVET, communities and societies would be empowered to develop enormously thereby leading them to progress and advance within the confines of SD. The real quest then begins with further exploring ways to advance the integration of ESD in TVET institutions practically and not just admitting their importance in reports and research documents and policies. As Gough (2009) puts it, integrating ESD within TVET institutions is not a one size fits all approach, the approaches recommended by UNESCO-UNEVOC and other leading agencies could be utilised as a starting point in this regard. Hence, as progress is observed, these approaches can be further adapted to suit the particular context of the country or institutions where it is being applied.

4.   Conclusion

This paper began by exploring various models of sustainability and ESD models in trying to ascertain the shared message they hold especially for teachers and educators. We found from our analysis that despite the varying perspectives conveyed in these models and the various ideologies they depict about sustainability. One important feature was common to all these perspectives, and that is the fact that they try to envision a world that is sustainable, and that meet the needs of present generations without compromising the ability of future generations to do the same. Evidently three important aspects (economic, social and the environment) must interact to foster and create sustainable development. Therefore, education for sustainable development must be centred on educating individuals within communities, to adopt sustainable ways of living in such a way that a balance in the economic, social and environmental aspects of nations can be fostered. Through the review, we were also able to identify important factors that contribute to the societal well-being and community development. From our analysis, we were able to synthesise data into a concept mas that explains these important factors and how they foster societal well-being and community development. we found from our synthesis that social wellbeing constitutes social capital, social equality and social trust all of which are needed to foster a healthy relationship that is characterised by integrity, honesty and faith between members of the society. We also found that social well-being is needed to create sustainable livelihoods (in that when the wellbeing of the society becomes a priority, societal leaders also make sustainable livelihoods a priority), resolve conflicts and promote peace, and all these also depend on whether a culture of sustainability has been integrated into value system, belief system as well as lifestyle of the society.

We reflect upon these factors that foster societal well-being and community development and conclude that they are reflected in the core principles of sustainable development as reported by (UNESCO, 2006c). Therefore, education for sustainable development inevitably contributes to societal well-being and community development given that the core principles which underpins sustainable development would be inculcated and developed within people as they learn to imbibe sustainable practices and make these a way of life. Conclusively we found that ESD is not supposed to be beneficial to any field of study in terms of economic gains and what such a field of study could stand to benefit from ESD, with TVET being no exception to this. We believe that TVET is supposed to play a role in

transitioning the world towards sustainable development, because TVET is a major supplier of the workforce of nations and that a sustainable percentage of the total distribution of workers come from TVET backgrounds. Having established this, we propose that TVET training programs begin to play that role by reorienting their programs to account for the integration of ESD across curricula. Presently we believe that TVET programs are not yet fully yielding to this call. A substantial part of the literature on ESD reports on individualistic efforts of some educators in trying to embed sustainability into the subjects and course they teach. Experts have recommended that for ESD to become effective and the purpose with which it is meant to serve, it must be holistically integrated into the curriculum and institutional practices.

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A SYSTEMATIC REVIEW ON EDUCATION FOR SUSTAINABLE DEVELOPMENT: ENHANCING TVE TEACHER TRAINING PROGRAMME

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ABSTRACT

As the call for the advancement of TVET deepens, and as skill requirement for vocations transcends traditional job requirements due to technological advancement and innovation. It becomes imperative that workers in the industrial and vocational ambits of nations develop the requisite skills and capacities for work in the 21st century that adheres to sustainable standards and meets market needs also. Thereby, contributing to societal wellbeing and community development. To achieve this goal, teachers in Technical and Vocational Education (TVE) have a crucial to play as they will be responsible for the training of workers and developing their skills and capacities for work necessary to improving societal well-being and community development. The challenge is that technical and vocational teachers are not being trained to develop capabilities for Sustainability. Using a systematic literature review, this paper critically examines the extant literature on education for sustainable development and provides a synthesis of the literature in identifying the shared message that SD and ESD models attempt to represent. Furthermore, the paper discusses the factors that foster societal well-being and community development through an ESD perspective. Conclusively emphasis is paid on the unique and significant role that technical and Vocational teachers can play in contributing towards the transition to sustainable development. Consequently, this paper culminates with an analysis of the various ways TVE can help contribute towards societal wellbeing and community development if SD is rightly integrated within TVE teacher training programs.

1. INTRODUCTION

The Sustainable development (SD) initiative is the result of deep reflections of the existential problems of humankind which also is a consequence of issues such as the overexploitation of natural resources and the promotion of economic development at the expense of environmental and ecological quality (Fien & Maclean, 2000; Fien, Maclean, & Park, 2008; Fien & Wilson, 2005; Majumdar, 2009). Today, Sustainable Development has become the guiding principles with which human development is weighed upon (Keiner, 2005) at least for some developed nations and for others it has become the ideal "word" for development that is not feasible (from an anthropocentric c perspective). Fundamentally, the overarching goal of Sustainable Development is to promote environmental, social and economic sustainability in a way that all three dimensions are approached in equilibrium while taking cognisance of the cultural context of the locale (Diesendorf, 2001).

The most common definition of SD has been "the development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland, 1987; UNESCO, 2006b; United Nations Educational Scientific and Cultural Organization, 2005). While this definition emphasises the fundamental principle of achieving equity between the present and future generations, there is no disagreeing that other description of the term Sustainable development exist and offers a similar but varied interpretation of the concept. However, it is not the goal of this paper to compare and juxtapose the varied interpretations of SD at this point. The purpose of this paper is to substantiate how Education for Sustainable Development (ESD) can help improve societal well-being and community development while also iterating the importance of integrating ESD within Technical and Vocational Education and how the intersection between both fosters societal and community development. These we would explore through a critical review of the extant literature on ESD.

As a starting point, we choose to offer our conceptualisation of the terms societal wellbeing and community development by exploring how they have been defined in the literature. Societal well-being is described as a state in which the basic human needs are met and people within a community are able to coexist peacefully with equal opportunities for their advancement (Keyes, 1998). Similarly, Cavaye (2006) describes community development as a process facilitated by community members where local people not only create more jobs, income and infrastructure but also help their communities become better at and capable of managing change. We opine that societal well-being and community development can be successfully fostered within a society or community when the principles of Sustainable Development have been embraced and imbibed within such community. A point we intend to buttress with supporting ESD literature. The Sustainable Development goal has been promoted by world organisations such as UNESCO, the OECD, the World Bank etc, through various initiatives, policies, regulations and awareness programs (Underwood, 2002; UNESCO, 2006a, 2012). This has been promoted world over with the view that enacting sustainable development goals would help reduce the effects of decades of unsustainable practices and activities which have resulted in the numerous issues we now face globally. These effects have resulted in issues which are being experienced world over such as climate change, global epidemics in the form of wars, conflicts between nations as well as natural disasters, environmental degradation, resource depletion, pollution, poverty, inequity etc (Fien & Tilbury, 1996; Majumdar, 2009; Reid & Petocz, 2006; United Nations Educational Scientific and

Cultural Organization, 2005). Irrespective of these policies, regulations and initiatives centred on reducing environmental challenges and the issues resulting from unsustainable human practices, not much has been achieved (Cebrián, Grace, & Humphris, 2015). Research literature (Sivapalan, 2016; Sleurs, 2008; Zolkifli, Kamin, Azlan, Yahya, & Z., 2016) has shown that these initiatives do not necessarily drive and sustain the needed impact for Sustainable Development. Perhaps a more pragmatic approach is required since the fundamental goal of Sustainable Development is to develop within nations a sustainability literate and conscious citizenry. The idea behind this line of thought is that a sustainable conscious citizenry would be able to live sustainable lifestyles and be cautious in their relationship with nature and this collective responsibility and practices can be consolidated to reduce the negative impact humans have had on environmental and ecological systems.

To develop a citizenry that is capable of living in harmony with nature and that does not impose unbearable and unsustainable burdens on nature (the ecosystem), it is important to empower people with the knowledge, skills, values, dispositions and capabilities required to do so. Leaders world over have agreed that it takes education to develop these knowledge, skills, values and dispositions required for Sustainable Development. Hence, Education for Sustainable Development (ESD) becomes important and crucial to attaining the SD goal of raising a sustainable literate and conscious citizenry. ESD has been declared the priority of priorities in the quest to transition nations towards sustainable development (UNESCO, 2005). Consequently, the (UNESCO, 2005) explains that ESD should be considered a major influencer in achieving the SD goal.

Education for Sustainable Development (ESD) is a transformative learning process that equips students, teachers, and school systems with new knowledge and ways of thinking needed to achieve economic prosperity and responsible citizenship while restoring the health of the living systems upon which lives depend on (Cloud Institute for Sustainable Education, 2016). Similarly, the New Zealand Ministry of Education (2015) describes education for sustainability as learning to think and act in ways that will safeguard the future and wellbeing of people and our planet. UNESCO (2006c) also conceptualises ESD as a means of empowering students to develop the knowledge and understandings, skills and attributes needed to work and live in a way that safeguards environmental, societal and economic well-being, both for present and future generations. ESD is thus very pertinent and central to attaining sustainable development. there has been a call for various fields and disciplines outside the field of environmental education to incorporate ESD into the core of their programs, and as educators in various fields begin to respond to this call steadily, there is the question of what importance does ESD hold for Technical and Vocational Teacher training programs? What meaning can we make from the various SD and ESD ideologies and perspectives? Can ESD foster societal wellbeing and community development. These are the questions we seek to answer by exploring the extant ESD literature. More specifically, our review was guided by six research questions;

i. What shared message can we infer from the various models and ideologies of SD and ESD?
ii. What factors contribute to societal wellbeing from an ESD perspective?
iii. What factors contribute to community development from an ESD perspective?
iv. What does the literature say about teacher's roles as change agents for ESD?
v. Can ESD integration into Technical and Vocational Education programs foster societal wellbeing and community development?

2. METHODS

The review strategy employed in this paper was that of a systematic literature review. The systematic literature review offers organised and systematic procedures for critically analysing research studies (Petticrew & Roberts, 2008; Pickering & Byrne, 2014). Evans, Stevenson, Lasen, Ferreira, and Davis (2017) also explains that a systematic review process enables researchers to utilise transparent review procedures to source for, evaluate, analyse and synthesise the results of relevant research well in advance to ensure that the exercise can be repeated and replicated. We applied this approach to primarily explore the perspectives and ideologies in the models of SD and ESD and what shared meaning (if any) they hold for educators. Furthermore, we sought to answer questions that relate to how ESD can be used to foster societal wellbeing and community development using Technical and Vocational Teacher Education program as a tenet for this exploration. We retain that while the systematic review approach offers explicit methodological procedures to produce a synthesis of evidence, however, we acknowledge our own subjectivities in interpretation and the limitations resulting from the information provided or otherwise omitted by the authors of the research papers.

2.1 Article sources

We are aware that ESD is a particularly broad area of study with several aspects of discourse, and because we wanted to ensure that data sources reflecting the questions for the review were covered we chose to utilise the following databases in our search-Scopus, Web of Science (WoS), JSTOR and Eric. Our choice of these databases was because we were exploring ESD from a niche area, that is within Technical and Vocational Education as well as the intersection between the ESD literature, social well-being and community development. We also found that these databases have helped scholars who carried out systematics reviews on ESD, so we chose to retain these databases in our search for research articles. Our initial search using the keyword- "Education for Sustainable Development" returned hundreds of thousands of research paper across the databases. But since we were not just interested in ESD alone, but its intersection with other areas such as Technical and Vocational Education, societal well-being, community development as well as ESD and SD models, we, therefore, utilised a much more focused search string across the databases. Our search strings were; "Education for Sustainable Development" AND "societal well-being" OR "community development" OR "vocational education" OR "Sustainable Development Models"; "SD Models" and "ESD models". We allowed the search to include peer-reviewed journal papers, book chapters, and research reports.

2.2 Article selection and screening

Using the search strings in the preceding section returned a total of 240 resources across the four databases (Scopus 34, WoS 49, Eric 94, and JSTOR 63). We then screened these results to exclude duplicates, articles not related to any of the six guiding questions for the review, as well as ESD articles that were not relevant to the review in the sense that they explored other issues, not within the scope of our review. This we did by analysing the paper titles, author keywords as well as abstract. This resulted in a total of 33 papers that were retrieved for in-depth reading and consideration. Finally, a total of 19 publications were retained for full review and synthesis

2.3   Analysing the articles

Articles relating to each of the guiding questions for the review were consolidated to produce a synthesis of evidence-based conclusions. Thereafter we provided our own submissions of the questions asked. These were then further discussed vis-a-vis a direct comparison with the submissions of the authors in the selected research papers.

3.   RESULTS AND DISCUSSIONS

3.1   What shared message can we infer from the various models and ideologies of SD and ESD?

To answer this question, we began by analysing studies that described models of sustainability or and Education for Sustainable Development and then we produced a synthesis of these models, their corresponding ideologies and approaches. Thereafter we made attempts to determine whether there are any shared or mutual messages that can be inferred from these models or whether the various perspectives depicted in the models can be consolidated.

A model is described as a systematic approach used to achieve a specified goal or result and it offers a description of the cohesive and consistent (scientific) iteration of the approach that leads to the desired result or goal (Van Bon, de Jong, & Pieper, 2008). Models are comprehensive tools that help us gather, analyse and share information (Madhavi, Shailaja, Gopal, & Keren, 2007). They help in communicating explicitly an intended objective. They are also means for communication between policymakers and researchers. These descriptions offer a conceptual definition of what models are used for and how they are created and developed. Models of sustainability are thus aimed at providing an understanding of sustainability from various viewpoints as conceptualised by different scholars. The following are descriptions of some models of sustainability

3.1.1   The three-pillar basic model

The three-pillar model of sustainability is a triad between three sustainability dimensions; environment, society and economy, with an emphasis on the society. Scholars describe it as the most basic sustainability model as it emphasises equity in human societies without taking cognisance of the human quality of life (Madhavi et al., 2007). Its approach to sustainability is one that emphasises at least one of the three basic building blocks of sustainability. It can be viewed as an intersection of three circles with each circle representing each dimension or as a structural model as shown in Figure 1. The model simply takes the dimensions of "environmental, social and economic resources" and labels them as requirements or preconditions for sustainable development. in this model, sustainable development is achieved when all dimensions work in unison and in synergy. Although some scholars (Thatcher, 2014) have argued that the model does not take cognisance of the interactions that exist between the dimensions of sustainability, rather each dimension of sustainability is treated as an independent entity in a triad relationship that must exist for sustainable development. the is also the argument that the model does not incorporate a time component which is a critical feature of the definition of sustainable development given at the World Conference on Environment and Development (WCED) held in 1987, where it was

stated that present needs must not compromise future needs. Irrespective of these valid criticisms of the model, at the very least, the model has identified three critical dimensions for sustainable development. This identification can be built upon by subsequent models which could further explore the interactions between these dimensions and how they can be better understood when viewed in tandem with the principles of sustainable development.
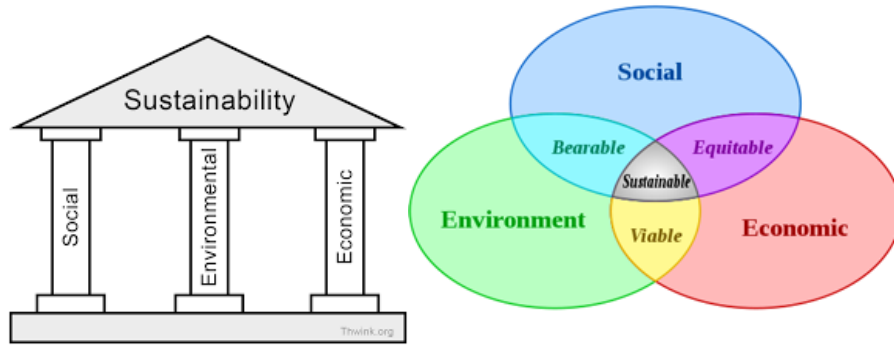

Figure 1: A Three-pillar basic model of sustainability (source: www.thwink.org)

3.1.2 The egg of sustainability

This model was designed by the International Union for the Conservation of Nature (IUCN) in (1994). Their approach to sustainability depicts that sustainability can be likened to an egg, with the yolk and egg white all enclosed under the shell. This analogy was used to depict the relationship between the ecosystem and people. With each enclosed within a system and with each also dependent on each other. A society is said to be sustainable if the interactions between the ecosystem and the people are both balanced and interdependent (Guijt & Moiseev, 2001). The ecosystem is viewed as the system with which the interactions between other dimensions depends on. Therefore, a society is deemed well and sustainable only if people and the ecosystem are well and healthy. Hence in this model, more significance or weight is given to the ecosystem (environment) than other dimensions of sustainability. The argument is that social and economic development can only take place if the environment provides the necessary resources for such development. Therefore, the ideology behind this model of sustainability, is that because the ecosystem is a coordinated system with which other entities or dimensions of sustainability depends on, then if there is a balance between the ecosystem and other dimensions of the system in such a way that the ecosystem dictates the level of control over the number of resources expended, then sustainable development can be achieved.
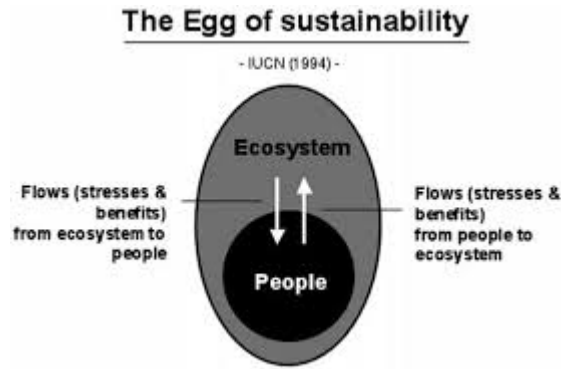
The Egg of sustainability

- IUCN (1994) -

Ecosystem

Flows (stresses &
benefits)
from ecosystem to
people

Flows (stresses &
benefits)
from people to
ecosystem

People

Figure 2: IUCN'S egg of sustainability (Source: IDRC, 1997)

3.1.3   Atkisson's Pyramid Model

Atkisson's pyramid model of sustainability takes a more problem-solving approach in its view of sustainability. The model supports and accelerates progress and development through an iterative process of first identifying sustainability visions, then proceeds through a process of analysis and brainstorming, after which agreements based upon a credible plan of action are reached. The pyramid structure sets out procedures that guide through the process of first building a firm foundation of understanding, searching for and collecting relevant information and ideas, and then focusing and narrowing down those ideas to what is important, effective, doable, and something that everyone can agree upon (Madhavi et al., 2007). Atkisson's pyramid models constitute a strategy for SD and its five hierarchical levels include;

    i.   Level 1: Indicators- Measuring the trend (What is happening?)
    ii.   Level 2: Systems- Making the connections (Why is it happening?)
    iii.   Level 3: Innovations- Ideas that make a difference (What can we do?)
    iv.   Level 4: Strategies- From ideas to reality (How do we do it?)
    v.   Level 5: Agreements- From workshop to real world (Actions) (Let's do it).

The model depicts a group decision-making process that is designed to facilitate understandings of sustainability and help people move up the learning curve, that begins from identifying the fundamental principles to system analysis, then to innovative strategies for action. Moving up the ladder, groups then practice cross-sectoral teamwork, make linkages and generate a pool of new ideas and work towards reaching a consensus- indicating a set of actions they have agreed upon to incorporate into the real world (Pearce, Hamilton, & Atkinson, 1996).

These three models do make valid attempts to contextualise sustainable development and make it tangible, however, these models have little significance to educators, who are supposed to answer the question of what ESD learning outcomes do we seek to achieve in our programs, as well as how do we teach these identified SD concepts and principles. Models are supposed to serve as guides towards achieving specific results and help in understanding a hypothetical situation thoroughly. These models have succeeded in doing one thing and that is, presenting different viewpoints of the sustainable development agenda and how the latter have been conceptualised by different people and organisations with a keenness to the sustainable development dimensions they seek to promote and develop.

One key message that can be depicted from these models is that three broad dimensions of economic, social and environmental factors must interact in some way to achieve sustainable development. Therefore, what is the place of education in sustainable development?

It has been emphasised that education plays a critical role in sustainable development. Education is a lifelong process that enacts the betterment and quality of human well-being can be fundamentally used to reshape the relationship humans have with nature for the purpose of promoting the health and wellbeing of people and sustenance of the planet. According to Shohel and Howes (2011), there are three known approaches to Education for sustainable development, they are; education about sustainable development, education for sustainable development, and critical education towards sustainable development.

Education about Sustainable Development (SD) is primarily aimed at developing a knowledgeable individual. Some scholars argue that this approach focuses on cognitive knowledge and since cognitive knowledge does not necessarily lead to a change in behaviour, little should be expected from learning that is centred on education about SD (Shohel & Howes, 2011). The second model, education for SD centres on practical and contextualised learning about how to live a better life and how to care for the present and future of the earth (Openg, 2012). Some scholars view this approach as an approach intended to enhance the way the ecosystem is maintained. The ecosystem is an umbrella for the other sustainability dimensions; such as social, economic and environmental dimensions.

Critical education towards SD which is the third ESD model particularly focuses on building human capacity to think and act critically in relation to sustainable development goals. These all have potential strengths as well as limitations for use within a school system. However, it may be argued that they lack rigour and explicitness in answering the question 'what learning outcomes do teachers pursue with respect to ESD' particularly technical and vocational teachers and also how these can and should be taught. Hofman (2015) opines that humans expect nature to adapt to our way of life when it should be humans adapting our way of life to protect nature since it offers us our source of livelihood and much more. This way of thinking is probably responsible for the way people relate with nature and perhaps the notion held by some educators that there is no substantial threat to our ecosystem and as a result, there is no fundamental reason to change the way we teach. Some vocational educators believe ESD has no substantial place in Technical and Vocational Education for the reasons that ESD does not provide vocational students with labour-sensitive skills that are demanded by industries (Sharma, 2009). Despite this notion being very erroneous, there is fundamental truth that vocations need to incorporate the principles of sustainable development to redefine how work is carried out, and this will no doubt require transformation that is compliant with the principles and goals of sustainable development Therefore, having discussed the inconsistencies in the ideas presented by these SD models and frameworks as well as their limitation in providing adequate answers to the fundamental questions vocational teachers ask,-how do we teach sustainability concepts within our vocational subjects? and what learning outcomes should our lessons focus on with regards to SD? The following section will attempt to answer the questions relating to social well-being and how TVE can help in fostering and achieving the latter and promote community development through the integration of ESD.

3.2   What factors contribute to societal wellbeing from an ESD perspective?

Recall that social wellbeing has earlier been defined as a state in which basic human needs are met and people within a community are able to coexist peacefully with equal opportunities for advancement (Keyes, 1998). Social wellbeing constitutes social equality, social capital as well as social trust. These three elements are responsible for the interplay between several other sub-elements which necessitates that a society has the needed tools with which such society can function effectively while promoting values centred on peace and social equality (Aked, Marks, Cordon, & Thompson, 2008). It can be summed up that social wellbeing can be mostly fostered by inculcating a culture of values education specifically aimed at improving the quality of life of people, leading to happiness and life satisfaction (Aked et al., 2008). Figure 3 shows a concept mapping of social wellbeing and its relationship to certain factors, determinants and components. This was developed by the researcher from a synthesis of the literature. While social wellbeing is needed to resolve conflicts, create sustainable livelihoods and promote peace, it is also an antidote to crime, stigma, racism and violence. It is dependent on the beliefs, value system, social inclusion and participation, as well as lifestyles of a group of people with shared identity and culture within a society (Aked et al., 2008; World Health Organization, 2001). While the literature also reports several approaches to attaining social wellbeing especially from a psychological and mental health perspective, social wellbeing can also be better achieved and promoted by education for sustainable development. ESD has been defined by the New Zealand Ministry of Education (2015) as learning to think and act in ways that will safeguard the future and wellbeing of people and our planet. The factors which promote social well-being in a society are evident in the principles promoted by sustainable development. Therefore, educating for sustainable development may also inculcate these values which promote social wellbeing.
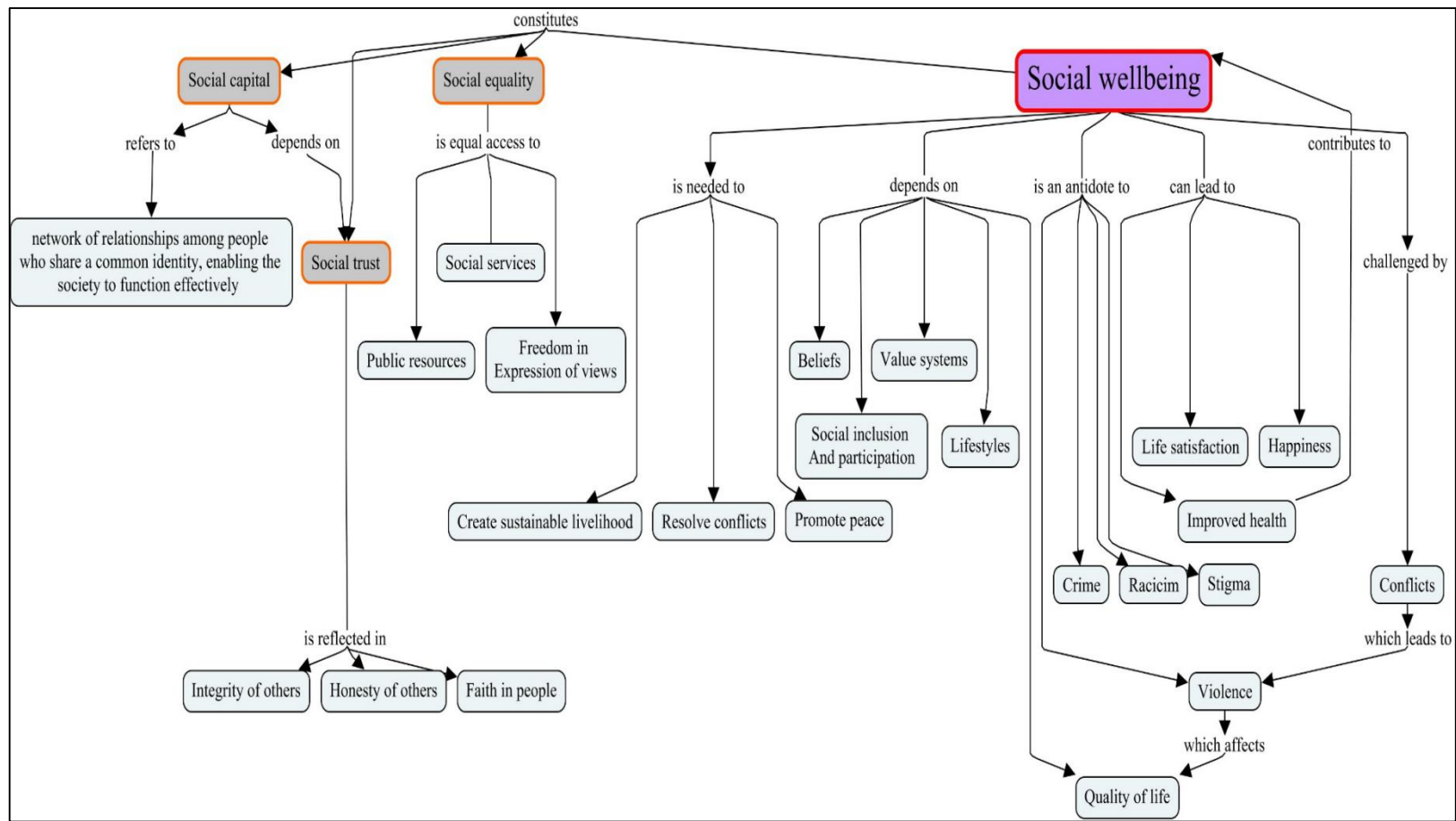
Figure 3: Concept Map showing the factors, relationships, determinants and Components of Social Wellbeing

3.3   What factors contribute to community development from an ESD perspective?

Community development according to Christenson and Robinson (1989) is a process whereby a group of people within a society or community reaches a decision to initiate a social action process to change their economic, social, cultural and environmental situations. Similarly, Phillips (1992) opines that it is a process that increases choice where people within a community can exercise their full potentials to lead productive and creative lives. Community development can occur when people within the said community believe that working together can make a difference, thereby collectively and mutually addressing their shared needs and interest for the benefits of the community (Flora, Flora, Spears, & Swanson, 1992). Biggs (1999) explains that it involves a process that begins with identifying the community's problems and opportunities and then assembling the community's resources, skills and relationships to build on the identified strengths of the community. Community development and social well-being can be likened to two sides of the same coin because both promote progress within a community. From the above descriptions of community development, it can be inferred that the later depends on the commitment of the community, resources, skills and relationships that can all be harnessed for the sole purpose of improving the economic, social, cultural and environmental conditions of the community.

Recall that SD is structured into three major dimensions, i.e. the economic, social and environmental dimensions all within the cultural context of the locale it is applied to. Therefore, if community development is fostered to improve the economic, social, cultural and environmental conditions of a community, education for Sustainable development could very well play a better role in achieving this goal since it is structured to bring about the education of individuals in terms of developing the knowledge, skills and competencies necessary to live sustainable lifestyles and create sustainable livelihoods. While community development may take on traditional approaches in fostering this progress for a community, ESD, on the other hand, takes a more pragmatic approach in educating individuals within communities to develop skills and values that also promotes sustainable progress and development. Instead of just deploying members of a community to come together in times of need, these community members can be exposed to SD concepts and ways of thinking that better prepares them to tackle identified community problems in sustainable and more efficient ways. But this cannot be attained if ESD is not holistically integrated into school systems and if teachers as agents of change are not trained and prepared to take on this role of educating for sustainable development (Abdulrazak & Ahmad, 2014; Ahmad, 1998; Bayani, 2010; Bosselmann, 2001).

3.4   What does the literature say about teacher's roles as change agents for ESD?

Teachers are no doubt crucial and fundamental to any change process. They influence the outcomes of change processes in some degree or dimension. The Zambian Ministry of Education National Implementation Framework III: 2011-2015 reports that *"the quality and effectiveness of the education system depend heavily on the quality of its teachers. Teachers are key persons in determining success in meeting the system's goals. In view of this, the calibre of teachers and the status of the teaching profession are of paramount importance. The educational and personal well-being of learners in schools, thus, hinge crucially on teachers' competence, commitment and resourcefulness"*. This speaks of the role teachers play in effecting change within their community, institutions, educational systems and learning spaces. According to Perraton, Creed, and Robinson (2002) teacher education generally constitutes four elements: improving the general educational background of the teacher trainee; increasing

their knowledge and understanding of the subjects and concepts they are to teach; exposing them to the pedagogy and theories of learning; and developing their practical skills and competencies.

As agents of change for the ESD agenda, teachers must be trained to develop understandings for Sustainable Development, develop the pedagogies and competencies for teaching sustainability-related concepts. Bass and Stogdill (1990) define an agent of change as a person or an individual whose act, actions, lifestyles influence others positively and cause them to act in a similar manner. Teachers are no doubt influencers within the educational systems, if therefore a teacher is exposed to the fundamentals of what ESD entails, such a teacher would be better prepared to undertake the task of being a change agent within the school system and community. Teachers as agents of change have been discussed within the overall context of education. But why are Technical and Vocational Education (TVE) teachers particularly relevant to the SD agenda? Research literature has revealed that TVET can be a very important medium to reach out to a whole lot of workers and develop their knowledge, skills and values about SD, since TVET is a major supplier of the total workforce of nations (Hofmann & Strietska-Ilina, 2013; Marsden, Medhurst, & Irving, 2013; Sivapalan, 2016; UNESCO & ILO, 2002; United Nations Educational Scientific and Cultural Organization, 2002; Zolkifli et al., 2016). The major implication is that TVE teacher training programs have the important task of reorienting their teacher training programs to reflect SD principles and integrate important SD concepts into the curriculum, so as to enable these teachers who would in turn train vocational technicians and workers in various occupations and vocations to become capable of inculcating these SD values, knowledge and understandings.

3.5   Can ESD integration into Technical and Vocational Education programs foster societal wellbeing and community development?

As much as teachers are recognized as central to the sustainable development agenda, it was not until recently that the important role TVET plays in such regards was recognized. Gough (2009) reports that recommendation 14 from the Tbilisi conference stated that *"the curricular of those undertaking technical and vocational education should include information on environmental changes that results from the sort of work they will do and that emphasis should be given to TVE with regards to;" (i) environmental applications for workers in each vocation, (ii) the collective effect of related vocations upon the environment.* Despite the many international forums and caucuses that had taken place over the past few years, the literature still records a low response to the call for ESD integration in TVET (United Nations Educational Scientific and Cultural Organization, 2008), especially in the training of TVE teachers. In the words of some scholars, some TVE educators see ESD as an irrelevant addition to the already overcrowded curriculum or the perception that there is no demand for SD skills and competencies from industries as held by other TVE educators, as well as issues regarding sustainability not being a mandate for TVE teacher training institutions (Gough, 2009; Sharma, 2009; Zolkifli et al., 2016). At a time when the necessity for ESD integration in TVE has continually been emphasised and re-iterated by UNESCO-UNEVOC and other leading organisations and scholars, it leads one to ask the question why are TVE institutions not responding to this call despite the vivid emphasis on the subject. Reflective analysis of the literature reveals that there is still a vague understanding of what ESD entails, what its goals are and how it should be pursued within TVE institutions (Brown, Sack, & Piper Rodd, 2013; Effeney & Davis, 2013; Essel, 2013; Evans, Whitehouse, & Hickey, 2012; Zolkifli et al., 2016). Perhaps, a re-emphasis of the benefits ESD holds is required as well as discussions about why it is an absolute necessity for TVE.

Technical and Vocational Education according to Thompson (2002) aims at developing human capacities in terms of the knowledge, skills and understandings required to enable them to function effectively in their chosen vocations. From Thompson (2002) descriptions of TVE, we can understand that one of the fundamental purposes of Technical and Vocational Education is to prepare individuals for economic life and gainful employment in a specific vocation or occupational area. Research has shown that human activities and the way in which work and operational processes are carried out impacts upon the environmental and social challenges which we face, which in turn necessitates the need for sustainable development. In order words, the practices and activities of workers and vocational professionals have a great influence on not just the economic implications for nations but also impacts upon the social and environmental systems. Imagine that the training of Technical and Vocational professional empowers them with knowledge, skills and capabilities to approach work in sustainable ways, perhaps there may be a significant reduction in the social, environmental and economic challenges we face today, since TVET accounts for most of the workers across nations (Hofmann & Strietska-Ilina, 2013; Majumdar, 2005; Unesco & Ilo, 2001).

Research and experience have shown that the traditional methods and ways in which workers carry out work processes and operations have some negative impact on the environment. The environment which is a complex interplay of the social, economic, and cultural dimensions of nations is affected in some way when and if we continue to engage in such work processes, practices and actions that have led to this massive deterioration of our ecosystem. To retrace our steps and correct our actions so that it is reflected in the way we work and the way we live, it is necessary that we unlearn those conventional ways of living and working we are used to and have been practising and develop sustainable and healthy practices instead. This is why education for sustainable development was conceptualised. Its purpose is to create a level of awareness of the environmental, social and economic issues that arise from engaging in unsustainable practices and inculcate SD skills, knowledge and values

Vocational academics and educators seem to be more concerned with what benefits ESD hold for Technical and Vocational Education. In our opinion, we do not share this view. We do not believe that ESD stands to benefit any academic field of study, rather we believe that it stands to benefit the entire human race as its principles are founded on the sustainability of our planet- (including earth's resources, human wellbeing, etc.), therefore we believe that rather than ask what benefits ESD have for Technical and Vocational Education, a more crucial question would be what role TVE can play to contribute towards sustainable development? UNESCO (2006b) reports some of the crucial role TVE can play in the transition towards sustainable development. The report explains that Technical and Vocational Education through lifelong learning can help transition nations towards sustainable development by becoming the tool for the promotion and realisation of the objectives of a culture of peace, the international citizenry, social cohesion and environmentally friendly culture. This can be done by reorienting TVE curriculum by incorporating important sustainable concepts that are fundamental to developing individual capacities to respond to the social, economic and environmental; challenges societies face, thereby contributing to the societal development and community integration. The report also emphasises that TVET of the future must not only prepare individuals for employment but must also develop them into responsible citizens who give due consideration to preserving the integrity of their environment and the welfare of others.

Now if ESD can be successfully integrated within TVE teacher training programs. The implication would be that TVE teachers would have acquired the requisite skills and competencies in disseminating ESD related content to their students who would, in turn, carry on these practices as vocational workers, technicians and craftsmen upon gainful employment.

Further implications would be that workers in the ambit of Technical and Vocational workforce while imbibing the values, knowledge, behaviours and understandings that underpin sustainable development, would significantly contribute to sustainable living and the negative impact of work processes on our ecosystem would have been significantly reduced. Since the principles of ESD reflects peace, equity, as well as empowers sustenance and economic well-being, if these principles are adequately integrated within TVET, communities and societies would be empowered to develop enormously thereby leading them to progress and advance within the confines of SD. The real quest then begins with further exploring ways to advance the integration of ESD in TVET institutions practically and not just admitting their importance in reports and research documents and policies. As Gough (2009) puts it, integrating ESD within TVET institutions is not a one size fits all approach, the approaches recommended by UNESCO-UNEVOC and other leading agencies could be utilised as a starting point in this regard. Hence, as progress is observed, these approaches can be further adapted to suit the particular context of the country or institutions where it is being applied.

4.   Conclusion

This paper began by exploring various models of sustainability and ESD models in trying to ascertain the shared message they hold especially for teachers and educators. We found from our analysis that despite the varying perspectives conveyed in these models and the various ideologies they depict about sustainability. One important feature was common to all these perspectives, and that is the fact that they try to envision a world that is sustainable, and that meet the needs of present generations without compromising the ability of future generations to do the same. Evidently three important aspects (economic, social and the environment) must interact to foster and create sustainable development. Therefore, education for sustainable development must be centred on educating individuals within communities, to adopt sustainable ways of living in such a way that a balance in the economic, social and environmental aspects of nations can be fostered. Through the review, we were also able to identify important factors that contribute to the societal well-being and community development. From our analysis, we were able to synthesise data into a concept mas that explains these important factors and how they foster societal well-being and community development. we found from our synthesis that social wellbeing constitutes social capital, social equality and social trust all of which are needed to foster a healthy relationship that is characterised by integrity, honesty and faith between members of the society. We also found that social well-being is needed to create sustainable livelihoods (in that when the wellbeing of the society becomes a priority, societal leaders also make sustainable livelihoods a priority), resolve conflicts and promote peace, and all these also depend on whether a culture of sustainability has been integrated into value system, belief system as well as lifestyle of the society.

We reflect upon these factors that foster societal well-being and community development and conclude that they are reflected in the core principles of sustainable development as reported by (UNESCO, 2006c). Therefore, education for sustainable development inevitably contributes to societal well-being and community development given that the core principles which underpins sustainable development would be inculcated and developed within people as they learn to imbibe sustainable practices and make these a way of life. Conclusively we found that ESD is not supposed to be beneficial to any field of study in terms of economic gains and what such a field of study could stand to benefit from ESD, with TVET being no exception to this. We believe that TVET is supposed to play a role in

transitioning the world towards sustainable development, because TVET is a major supplier of the workforce of nations and that a sustainable percentage of the total distribution of workers come from TVET backgrounds. Having established this, we propose that TVET training programs begin to play that role by reorienting their programs to account for the integration of ESD across curricula. Presently we believe that TVET programs are not yet fully yielding to this call. A substantial part of the literature on ESD reports on individualistic efforts of some educators in trying to embed sustainability into the subjects and course they teach. Experts have recommended that for ESD to become effective and the purpose with which it is meant to serve, it must be holistically integrated into the curriculum and institutional practices.

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