Sustainability Achieved Through Education

Brian D. Janner

Abstract

The purpose of this paper is to identify the absence of sustainability teachings within our private school systems, introduce a program for the school systems to incorporate into existing curriculum, and present the process that would be needed to be followed for introduction of this program. There is a growing interest in the topic of sustainability and how it potentially will affect the next generations. Today some large companies and even some countries around the world are engaging in sustainability practices. Currently this is a very small piece of action regarding what needs to take place to hope to promote change around the world. Layering sustainable teachings and practices into children in their formidable years through graduation from high-school will bring about individuals that incorporate sustainable living into their everyday personal and professional lives. Repeating this practice generation after generation will ensure a sustainable planet.

Keywords: Sustainability, Education, Sustainable Education, Implementation, Primary School, Curriculum

Sustainability Achieved Through Education

Vision

A world where each generation passes a new and more sustainable world to the next.

Mission

The Sustainability Through Education Program inspires teachers at all levels to provide lifelong sustainable based knowledge for our children to build upon in their personal and professional lives.

The idea behind this project is to analyze the context of sustainability teachings within our private school systems. The knowledge is balanced around initial investments in how human capital can offer significant returns to individuals and communities with far reaching successful global effects. Developing a solid base in the formidable years of learning can translate into sustainable behaviors in their adult lives. The main audience persona for this project will be those directly involved with the development of our children, the teachers in the private school sector. These individuals are the greatest influence on our children and their learning process. The younger generations within our school systems are our next leaders of government and industry.   Layering sustainable ideas, processes, and thoughts is like building a base or frame to build upon later can help develop young minds into future sustainable leaders. The teachers are the ones affected immediately through program-based behavior changes but will also be the leading tip of the conversion. According to Hargreaves and Fink, "in education, the first principle of sustainability is to develop something that is itself sustaining. Sustaining learning is therefore learning that matters, that lasts and that engages students intellectually, socially, and emotionally. It is not achievement results, but the learning behind them that matters most. The prime responsibility of all educational leaders is to sustain learning" (Hargreaves and Fink p. 3). Constant pressure in the form of information through story will be important in filling the gaps that will come and go over time because of changing environment, changing technologies, and evolving lifestyles. "There is growing international recognition that education must include all of the elements needed for success in school and must refocus to prepare children for the tests of life, not for life of tests" (Elias, Zins, Graczyk, and Weissberg p. 303). This slight disruption of today's educational curriculum stems from the questions that we should have been asking ourselves for several decades now: What if? And Why not? These two questions come with the higher purpose of making things better now and to bring about a constant sustainable future.

This program is looking to connect to the private school system within central Texas. The project in generalities will align with any school. The project will adapt where needed to accommodate any charter rules or policies that vary between schools, specific terminologies, and flex in the delivery of the process with regards to agendas or locations. The team as of now is of one. A key component within each school will be to identify as the program overseer once the program is in full motion. This individual (teacher, counselor, principal, school board) will ensure that the program continues the course, with everyone serving as the liaison between the school and the program developer. The school will have an individual that needs to be in that role acting as a direct link to host program when changes need to occur, or the school is getting off track.

The project is one that will take one school at a time to total training before moving to the next school. Some barriers according to International Journal of Sustainability in Higher Education that may arise in the private school sector: "The freedom of individual faculty members, incentive structure that does not recognize faculty contributions to sustainable development, lack of desire to change and pressure from society. Unless society demands major changes in the desired characteristics may find little reason to make transformations and may continue with the status quo" (Balas, Adachi, Banas, Davidson, Hoshikoshi, Mishra, Motodoa, Onga, & Ostwald p. 297). Anticipated challenges may include scheduling, distance for face to face meetings, time investment in research of information for main body of project going forward, but none that are project killers. The strategy is to not to scale to quickly which is where other programs have lost some momentum or just faded away. The belief is in the ability of the program to impact global change and the power within others who connect with this program to ensure creation of a sustainable world is made through education.

Short-term success will be achieved when children who are going through the program are asking questions concerning the things they do now and how it will affect them, their communities and even the world in 10,15, 20 years. Another milestone will be when the children in this program start their own programs and begin to enhance the existing program to accommodate and incorporate changing generational styles. This program helps children realize that there needs to be a greater purpose with a distant future in mind. This program will not be an overnight success; however, it will get a strong foothold in communities throughout the state over several years then begin to compound over time. Empowering these children with the

power of relatable story and tools will bring to others exponential movement. The project is one that will take one school at a time to total training before moving to the next school. The voids that exist currently (lack of expertise) are ones that can be filled by research and experience through private school networking.   After x number of schools are up and running there is the potential to add additional personnel to maintain the monitoring process and potential process adjustments that may be needed. "Highlighted advantages of using an integrative teaching approach, which includes allowing teachers to plan for the development of key skills and understandings that transcend individual strands and subjects, while helping students to build on their diverse prior knowledge and experience, support their holistic view of the world, and ensure more meaningful learning" (Mwendwa p. 4). This paradigm shifts involves how children are taught in the first years of education and throughout the educational process and one that will require 1-2 years of lead time. Careful planning with the appropriate people coming together over time and through numerous phases.

"In our headlong rush for global competitiveness, preparing students for college, increased rigor, we've lost our balanced perspective on education for the head, hand and heart. It's all head, no hand and heart. But if we can keep their hands busy and make their hearts full, they'll be happier and smarter. It's time to revive the Pursuit of Happiness as an integral component of our national educational agenda" (Sobel p. 5).

Phases into Everyday Curriculum

"The politics of school board elections and tax levies, along with superintendent turnover, create pressure to show quickly that one's work is good. Long-term dangers accrue when one bypasses the front-end time needed to build constituencies committed to the goals and the process of change; to look honestly at the current state of conditions, services, and resources; and to establish management capacities that will allow change efforts to persist over time and through changes in leadership" (Elias et al., 2003).

Transformation Process

    Key Traits Needed for Program to Build Around

In the Journal of Sustainability in Higher Education 2008 there are (there are several others) key characteristics identified that are used at the university level that are transferable into the private primary school sector:

- The process must not be one directional but rather "interactive and learner-centric with a strong emphasis on critical thinking ability" (Balas et al., 2008).

- Problem-solving in a way that students must be able to deal with real world problems and unforeseen circumstances that will happen to future generations (Balas et al., 2008).

- "Networking of the entire school campus that allows tapping into all resources available" (Balas et al., 2008).

- "Leadership and vision that promotes needed change accompanied by proper assignment of responsibility and rewards, who are committed to a long-term transformation and are willing to be responsive to society's changing needs" (Balas et al., p. 296).

- "Societal problem-solving orientation in education and research through an interaction through multiple interfaces to be pertinent to societal goals. As a result, students must be able to deal with the complexities of real problems and the uncertainties associated with the future" (Balas et al., p. 296).

Mwendwa (2017) wrote that in an integrated teaching approach or sustainability through education within current subjects must bring as one the following areas: "knowledge, skills, attitudes and values from within or across subject areas to develop a more powerful understanding and linkages of key ideas" (p 4).

Phases of the Implementation Process

Strong sustainable programs do not just appear. There is a process and layering that must take shape in time. This program follows the outline below for implementation into private school curriculum.

School identification and buy-in

This program is targeting the private school sector within a 50-mile radius to ensure that the initial pilot program schools needs are met and given the proper attention needed to launch successfully. The mid-term goal is to launch in every county in the state. The private sector versus the public sector is to be used to solidify the program before scaling into the public-school systems. Private schools also offer more flexibility with introduction of new and sometimes considered "different" material for the students. Regardless of the school, contact with key personnel is needed. The key personnel individuals would include school administrators, principals, curriculum selection members and key school board members. The identification of key personnel is easily obtained from the school's web site. Initial contact with these individuals includes introductions, background of the program and how "sustainability is about engaging, learning, and teaching to create a positive, empowering future for our children and their children" (McKey p. 2). Within this initial contact it will be learned what types of attitude each school has towards the subject, levels of understanding and in some cases no response. There is an awareness within schools (varying degrees) of the need of teachings and better understandings. "Overall, it appears that today's students understand that there is a need for improved sustainability and waste control, and the need to reduce environmental impacts, but discrepancies arise regarding who should take responsibility for these actions, and how sustainable concepts should be implemented" (Rosentrater & Burke p. 3). Once interest from key school leaders develops a request to meet with all key personnel to provide a formal presentation of program to include where have we been, where we are now and what the future looks like on the current path. How the incorporation of this program can immediately benefit locally and at the same time build more of a global view of a more sustainable world and finally the impact on the school, teachers, and its administration. Once a school has bought into the program it is imperative to stress the on-going need for communication and support from the leaders of the administration. Adjustments to curriculum results in teachers working through phases until they are comfortable with the new subject matter.

Teacher phases of implementation

Many researchers that study school change have come to a common conclusion that teachers involved in change commonly go through four phases from start to finish of a new way

of teaching (Evans, 1996; Fullan, 2001,2007' Hall & Hord, 2006; Reeves, 2009). The phases include: "Phase 1: Non-Use","" Phase 2: Initial Use", "Phase 3: Routine Use", and "Phase 4 Refined Use" (Hall &Hord, 2006). Without complete understanding of each phase teachers will not receive the information and support they need to make a program successful and the ability to make needed changes along the way.

"Phase 1: Non-Use"

In this phase teachers need every detail of the program (how is it to be delivered to the students, the scale, training to be received, etc.). These needs can be met through workshops, one on one coaching and literary material from the hosting program. Success is measured in this phase with the teachers complete understanding of the program. Within this phase the entire teaching staff is brought together to identify any structural challenges and to set up outside training for those with the biggest needs depending on level of knowledge on the topic of sustainability and the comfort level of layering that information into everyday assignments. Outside training/coaching can be one on one with program experts (individuals who already know the material and understand the process from launching similar previous programs. Once a week or as needed meetings with staff to talk and work through some challenges they are facing and how other staff members are dealing with similar opportunities. Success in this phase will be represented when teachers begin to "possess means for representing and communication the knowledge and skills to the learners. Teachers must not only know the subject matter that they teach, but also the appropriate methods to transform it for the purpose of instruction" (Mwendwa p. 9).

"Phase 2: Initial Use"

The actual act of presenting the new program begins in this phase. The teachers work through practice lessons, become comfortable with the material, and then begin to interact with their instructional coach or enthusiasts of the new program (individuals who have quickly taken to program and content that are already on staff within the school, and/or an individual with a higher-level degree in pertinent subject matter) or others that have implemented the same or similar programs. Teachers should also observe fellow teachers and encourage constructive feedback of the material. This is the practical learning part where each week the teachers come

together to work through the roadblocks or areas that are not clear. Success in this phase is seen when the teachers have worked the program start to finish (understanding what sustainability from a personal level to the global level is, what it means to future generations and thinking local while having a global vision), understand all the aspects and are now just practicing their delivery (timing, animation, relational stories).

"Phase 3: Routine Use"

This phase brings back in the needed support from administration and peers. Teachers begin to feel confident in their understanding and delivery of the program, but they will have questions and issues that they are encountering and need to feel like the administration and the school itself is there to listen and work through any opportunities that arise. If there is lack of support from the school or the administration in this phase, the program becomes at risk of being modified or even stopped because of some sort of frustration. Administration is taught to open lines of communication and to continue to look at other avenues of keeping the school faculty engaged with potentially layering in a "green" campus, up to date recycling, water conservation through low water landscaping, etc. These types of initiatives create a sense of immersion surrounding the teaching of sustainability and those receiving the education.

"Phase 4: Refined Use"

This is the time when the program is understood and delivered the way it was intended to be delivered. Presentation and dialogue about the program are good. The refined use phase allows the teachers to adjust small areas of the program to meet the needs of the students. Teachers begin to look at data (test scores, pace of class, student interactions) since the inception of the program and then meet with department heads and instructional coaches to formalize the changes. Teachers have now been able to develop their individual classroom styles that meet their individual students and have begun incorporating current happenings locally and around the world as they pertain to sustainability.

These four phases simplify the implantation of the program. Within those phases "the expectation of the United Nations Educational, Scientific and Cultural Organization (UNESCO) promotes ESD [Education for Sustainable Development] for addressing current and future needs through education by harmonizing environmental, societal, cultural and economic considerations

in the pursuit of an enhanced quality of life" (Wolbring & Burke p. 2328). The expectations of these teachers going forward will be the layering in of the following information to ensure that the pupils in these private schools are receiving an "education for sustainable development [that includes]:

- is based on the principles and values that underlie sustainable development;
- deals with the well-being of all four dimensions of sustainability-environment, society, culture, and economy;
- uses a variety of pedagogical techniques that promote participatory learning and higher-order thinking skills;
- promotes lifelong learning;
- is locally relevant and culturally appropriate;
- is based on local needs, perceptions, and conditions, but acknowledges that fulfilling local needs often has international effects and consequences;
- engages formal, non-formal and informal education;
- accommodates the evolving nature of the concept of sustainability;
- addresses content, taking into account context, global issues and local priorities;
- builds civil capacity for community-based decision-making, social tolerance, environmental stewardship, an adaptable workforce, and a good quality of life;
- is interdisciplinary. No single discipline can claim ESD for itself; all disciplines can contribute to ESD" (UNESCO).

"Instead of quick 'check lists' of competences, we need a democratic, deliberative, and situated process of first specifying desirable competences (by asking whose needs and desires are being addressed for what purposes in what kinds of world) and then carefully articulating them in educational programmes" (Wolbring et al., p. 2336). Currently there are only guidelines with loose expectations that are left in many cases up for interpretation. The goal here is to initiate a change in the most efficient way possible. Teachers are encouraged to use free thinking as it relates to the bullet points of education

for sustainable development while encouraging those being taught to do the same to others to promote common thinking at a very young age.

Some examples of what that looks like layered into everyday subjects, would look like the following (provided by Mwendwa in the Journal of Sustainability Education 2017):

Subject	Class	Topic	Objectives
1. Biology	Form I	Safety in our environment	i. General concepts including, safety in home/schools, first aid, waste disposal. ii. Health, immunity and HIV/AIDS.
	Form II	Balance of nature	i. Concepts of natural environment, ii. Interactions of organisms, food chain and food web.
2. Geography	Form I	Climate	i. Concept of climate and its relationship to human activities
	Form II	Water management for economic development	i. Relationship between vegetation and water supply ii. Benefits of developing river basin. iii. Land reclamation and sustainable use of water resources. iv. Water pollution and conservation
		Sustainable use of forests	i. Types, distribution and importance of forestry resources in ecological and environmental balance. ii. Ways to address problems facing forests in the world
		Sustainable mining	i. The effects of mining on the environment and ways to minimize them
		Manufacturing Industry	i. Types of pollutants from manufacturing industry
	Form III	External forces that affects the earth mass wasting Weathering, erosion and deposition	i. Effects of external forces on the environment.
		Soil	i. Concept of soil formation, erosion control and conservation.
	Form IV	Climate and natural regions	i. To explain the relationship between human activities and climate.
		Environmental issues and management	i. Importance of environment ii. Environmental problems
		Environmental conservation	i. Cause, extent and effects of the loss of biodiversity. ii. Pollution and waste management. iii. Cause, extent, and impacts of fast rate of population growth, urban growth, and diversification. iv. Impact of poverty on environment. v. Environmental conservation and management at

Source: Secondary school syllabus (2005), Tanzania Institute of Education.

Today "there is increasing interest in the role that schools can play in promoting education for sustainable development (ESD), and evidence is emerging that schools can be influential in the emerging agenda around the ecological, ethical and social aspects. Research is

emerging that suggests that whole school approaches to ESD may be able to transcend the targets culture (where schools are driven to meet government targets at the expense of deeper learning) that has emerged in schools in recent years" (Weitkamp, Jones, Salmon, Kimberrlee and Orme p. 1128,1129).

Beyond implementation

The implementation process should run between 9-12 months depending of the level of knowledge and comfort at the initial start. In the final phase teachers should begin to make the program their own with personal touches to link the students with the subject matter. One way the program suggests helping students to truly grasp sustainability is putting them in direct connection with nature. "One of the main strategies commonly advocated for facilitating the needed reconnection with nature is of course environmental education, which, proponents argue, should consequently strive to provide participants with the direct exposure to 'natural' spaces that will ostensibly re-inspire their sense of affinity with and hence care for the nonhuman world" (Fletcher p. 1). Physical engagement with the outside is highly encouraged when available to the teacher and the students. Mwendwa et al., (2017) conducted focus groups to help understand students basic understanding of environmental issues. "Students had difficulties in conceptualizing specific areas outside the classroom where they should apply their environmental education. When asked the question, 'What are specific areas do you apply environmental education outside the classroom' during focus group discussion, no one volunteered to respond, after a thorough probing, four students managed to mention tree planting and agricultural activities as an area where they can apply the environmental knowledge they are learning. This signifies that either teachers have not done enough with environmental education at the school or there is a problem somewhere with the integration of environmental education in the school curriculum" (Mwendwa p. 7).

Assessment

Currently "there is a noticeable increase in interest with regards to sustainability in higher education. As institutions investigate, implement and market sustainability efforts, there is a myriad of sustainability assessment methodologies currently available" (Maragakis &

Dobbelsteen p. 1). These assessment tools (STARS, Princeton Review Green Rating and College Sustainability Report card) can later be used to assess individual levels of sustainability within the private schools once the programs are rolled out and established. The U.S. Department of Education also awards Green Ribbon Schools of which "reported evidence of ecological and democratic principles. Schools, school districts, and post-secondary institutions use the ED-GRS framework of the three pillars (1) reducing environmental impact and costs; (2) improving the health and wellness of schools, students, and staff; and (3) providing effective environmental and sustainability education to benchmark their progress in each of these areas" (McKey p. 3). This is an award's program to also build into the Sustainability Through Education program. Mckey et al., (2017) states that the benefits that have been noted surrounding the winners of the ED-GRS Award include: "(1) cost savings (2) improved student and staff productivity (3) increased student engagement (4) enhanced critical thinking, civic skills (5) preparation for green jobs of the future and (6) reduced behavioral problems" (p 3).

Sustaining Sustainability through Education

The sustainment level of any program is the most difficult, especially with a new and only somewhat socially backed program. Rosentrater et al., (2017) states that regardless of demographic, students appear to be interested in environmental topics, reducing their footprint, and improving the environment overall, but they did not necessarily want to pay more, nor did they fully embrace personal responsibility" (p. 2). This statement is from a study conducted at Iowa State University with college students. The target of the program discussed in this paper was not directed at students at higher education, but the statement shows how our children's mindset and views have evolved from the development taught in the formidable years. Sustainment begins and continues to layer upon layer when one is constantly emerged within it. Encouragements and processes that are currently in play within our schools can be easily modified to adjust and promote sustainable processes in and out of schools. The above statement reads somewhat differently if the individuals interviewed in the study had twelve years of experience and immersion in the promotion of a sustainable world. Individuals acquire information not only through the educational systems. Today's technology provides information through internet sites, family, friends, government reports TED talks to only name a few. All these other sources will always be readily available and cannot be prevented. To sustain

Sustainability Through Education the program can hope to establish a solid framework that will help to encourage and promote the understanding of all the other information that is taken in, in a way that is directed at local and global sustainability. Some keys to ensure there is growth going forward:

- "involvement of external experts and resources, possibly provided by specialist support agencies or as part of national schemes, such as the Eco-Schools initiative
- Highlight the importance of planning and support schools to identify ways to integrate these into the curriculum or other school activities
- Help schools to identify ways to facilitate the involvement of the wider community in the programme
- Facilitate sharing of good practice between schools, through partnership links and development of progressive skills-based learning approaches" (Weitkamp et al., p. 1138).

The planet will not be gone tomorrow or in a hundred years, but it will eventually be gone if it continues its current path of short sighted use of natural resources and overuse of products. Currently it is seen that large corporations and even some countries are taking sustainability seriously. As of now the current efforts are of little significance in relation to the vastness of the problem. Delivering sustainable teachings throughout the school years for students will inspire and enable the generations to come to correct our current path.

"Problems cannot be solved with the same thinking that created them." –Albert Einstein

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Appendix A

Supporting Web-Sites

Education for Sustainable Living?

"Students gain knowledge, skills, and values to address the environmental and social challenges of the coming decades.”

https://www.ecoliteracy.org/article/what-education-sustainable-living

Achieve Through Education!!

"Achieve through education is a non-profit 501(c) (3) organization that seeks to provide individuals from the underserved and underprivileged community quality educational opportunities in order to empower them to reach their goals and improve their quality of life. achieve through education believes that education is the key to achievement, success and emotional well-being in life."

http://www.achievethrougheducation.org/

Education for Sustainability: Some Questions for Reflection

"All persons and communities should be empowered to exercise responsibility for their own lives and for life on earth. thus, they must have full access to education, political enfranchisement and sustaining livelihoods; and they should be able to participate effectively in the decisions that most affect them."

http://www.bgci.org/education/article/0294/

Sustainable Development through Research and Higher Education in India

"Sustainable development policies highlight the role of education which has become the need of the day to create the awareness among the students, researchers and teachers as well as in local communities for environment protection."

http://pubs.sciepub.com/education/2/3/1/index.html

Education for Sustainable Development

"The process of equipping students with the knowledge and understanding, skills and attributes needed to work and live in a way that safeguards environmental, social and economic wellbeing both in the present and for future generations."

http://www.qaa.ac.uk/en/Publications/Documents/Education-sustainable-development-Guidance-June-14.pdf

Education for Sustainability

"This platform has been created to support learning, action and innovation for sustainability through formal and informal education. through this platform you can share the stories and resources for a sustainable and flourishing society."

http://educationforsustainability.info/

Ten Ways to Integrate Sustainability into the Curriculum

"Sustainability can be integrated into the curriculum to help build ecological awareness for students, staff, and faculty."

http://www.aashe.org/ten-ways-integrate-sustainability-curriculum/

Learning for Sustainability in Scotland.

"Scotland is unique internationally in having a requirement for all teachers and education professionals to address Learning for Sustainability (LfS) in their practice to conform to the GTCS Professional Standards."

https://www.ed.ac.uk/education/professional-learning/connecting-classrooms-learning-and-sustainability

Across the Pond Lies Sustainable Education.

"TEACHING AND LEARNING FOR A SUSTAINABLE FUTURE is a UNESCO program for the United Nations Decade of Education for Sustainable Development. It provides professional development for student teachers, teachers, curriculum developers, education policy makers, and authors of educational materials."

http://www.unesco.org/education/tlsf/

Classroom Tips for Sustainable Teachings

Stuck on how to appeal to your students in the classroom when it comes to teaching sustainability? Easy tips to get you and your students on the same page.

https://www.consumerclassroom.eu/content/5-tips-teach-sustainability