Abstract

Garden Based Learning – Moving the classroom outdoors- An investigation into the concerns of three teachers regarding the use of GBL as a strategy for teaching and learning at Green Thumb Primary in North East Trinidad.

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The potential for Garden Based Learning to contribute to a greater appreciation for food security and ecological literacy in Trinidad and Tobago seems to be significant. This qualitative study sought to investigate the concerns of three teachers regarding the use of GBL as a strategy for teaching and learning at Green Thumb Primary in North East Trinidad. Three teachers, purposefully selected for this study, were interviewed during the month of March 2013. The views expressed by the teachers were summarized and discussed under the stages of concerns identified in the Concerns Based Adoption Model (CBAM). The results indicated that teachers generally possessed deep personal concerns about the GBL innovation and the consequences it held for them on a personal level. Teachers were also concerned about how the changes necessary to accommodate the implementation of the innovation will be managed in practice, that is, the group as a whole, shared concerns about issues of time, availability and distribution of resources and other general management issues. From a concerns perspective, administration must work together with teachers to design strategies to address lower-level concerns such as informational and personal concerns, in order to allow teachers who serve the vital role of implementers of the GBL innovation to focus on higher-level concerns of management, consequence, and collaboration.

Future research is needed to understand what aspects of Garden Based Learning experiences can be used to supplement teachers' cadre of approaches to effective curriculum enactment.

Key words: Garden Based Learning, GBL, Concerns, The Concerns Based Adoption Model, CBAM, Stages of Concern.

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CHAPTER ONE

Introduction

Background

Garden Based Learning (GBL) is by no means a new approach to curriculum enactment. Grounded in experiential education, this approach seeks to link curricula objectives with gardening and ecological awareness. Historically, school garden programs have developed in tandem with the economic and social needs in many countries. For example, during the last world war, many countries encouraged school gardening as a means of national security as it contributed to their food supply. Also, during the 1970's, when the impact of industrialization and population growth on the natural environment were given significant credence in the United States, school gardens were identified as an obvious way to link children with nature and promote an environmentally conscious populace. Currently, GBL projects in the United States such as Learning Through Landscapes (LTL) have attempted to move the outdoor classroom to the top of the educational agenda. Germane to the goals of LTL is immersion in the school garden which, for students, brings about a better understanding between town and country, and a keen power of observation in all things alive. The LTL initiative recognized the importance of gardening through which children gained first-hand experiences with the seed-to-seed cycle; the joy of the harvest; the taste, touch, and smell of fruit, vegetables, and flowers (Lucas, 1995). The present thrust in the school garden movement in many parts of the United States has been largely influenced by the collective discourse of educators, environmentalists, and agricultural reformists.

In 1995, California's State School Superintendent, Delaine Eastin, mandated that every school must have a garden to create better opportunities for children make healthier food choices, and become better nourished. Though this aim was not fully realized, Eastin's vision gave impetus to the development of gardens in other states as well. Orr (1994) opined that children raised in ecologically barren environments are robbed of the sensory stimuli and the kind of imaginative experience that can only come from biological richness. Moore (1995) suggested that children's gardening can be introduced within the broader frame of reference of sustainable development, regenerative design, and bio-design. He argued that children, the future leaders and participants in the democratic process, must interact daily with an educational environment containing a diversity of living ecosystems. According to him, gardening in the primary schools is the most feasible pedagogical approach for ensuring this type of daily learning experience as well as for reversing a worrisome trend in the opposite direction.

Studies conducted in some schools in Africa revealed that current curricular emphasis in most countries in the Sub Sahara region have focused less on practical skills in learning, and more on theoretical understandings (Horst, Jonah & Morna 1990). However, in Sierra Leone 80% of all schools have hands-on gardening classes. Their research also revealed that after gardening in schools, children in this region were more likely to help their parents' farm at home, eager to show them what they have learned. This was seen to develop prestige for farming in the minds of children and a love and passion for the land while promoting food security and eco-literacy.

In Bolivia, the Schoolyard Ecology program conducted by Audubon, an organization committed to ecological conservation, utilized the schoolyard as an extension of the classroom. In this

hands-on laboratory, children learned about their physical and biological surroundings through exercises that also allowed them to develop basic academic skills. According to the Audubon organization, this form of education shifts the educational paradigm from the standard curriculum of rote recitation of multiplication and vocabulary, towards hands on participatory, student-centered pedagogical practices.

Cornell University's GBL program educator, Christine Hadekel, conducted a GBL workshop in Bridgetown, Barbados in 2009. The event, entitled "Linking Health, Nutrition, and Agriculture by Integrating School Garden-Based Learning through 4-H", was organized by the United Nations Food and Agriculture Organization (FAO). Among the 60 workshop participants who represented more than a dozen Caribbean countries, were primary and secondary school teachers, principals, 4-H leaders, and officials from Ministries of Health, Education, and Agriculture. Two school garden educators from Louisiana State also attended the event. Participants discussed the common challenges they faced with their school garden programs and brainstormed creative ways to overcome them. A group strategic plan was developed to provide each of the countries with a model for moving forward with the long-term planning of their school garden initiatives.

Haynesley Benn, the Minister of Agriculture for Barbados, demonstrated his full support for school GBL in his opening remarks for the workshop, noting that:

> "Several subjects can be integrated into the garden curriculum, including mathematics, language arts, geography, entomology, botany, landscaping, drawing, arts and crafts, music, manual training, physical education, home economics, nutrition and health promotion, small business and entrepreneurship and communication."

However, to date, there is little evidence that any of the ideas proposed in this regional workshop were adopted locally. Further, no significant effort was placed in integrating the Caribbean GBL group strategic plan into the national primary school curriculum of Trinidad and Tobago.

In Trinidad and Tobago, there have been previous attempts to introduce GBL in Primary schools. The Community Level Food Security and Nutrition Enhancement Programme funded by the Food and Agriculture Organization (FAO) was established in 1996 to heighten awareness of the linkages among agricultural production decisions, food choices and health outcomes, through the establishment of school-gardening programmes. This program funded school projects supporting garden-based learning in Trinidad and Tobago, including technical and financial support for the organization of initial planning meetings and national consultations. These activities were all geared towards the development of project proposals on Garden Based Learning.

To date, while some primary schools in the country, including the institution under study, received funding to construct buildings and purchase materials through this initiative, there has been little follow-through where implementation of a school GBL plan is concerned. Also, as part of the Bachelors in Education programme offered by the University of Trinidad and Tobago, teachers who pursue agricultural science and primary education specialization courses are currently exposed to curricula that contains principles and practices of GBL and how such an instructional strategy can be used to enhance teaching and learning at the primary school level. However lecturers who supervise student teachers on practicum for the University of Trinidad and Tobago have indicated to this researcher that most of these trained teachers are not afforded the opportunity to implement GBL programmes in the schools in which they are placed which may be due to the lack of resources and time to do so.

School Context

The institute under study was a denominational primary school in North-eastern Trinidad. Historically, the students were always encouraged to plant crops in the school garden merely as a part of the agricultural science syllabus. Consequently, emphasis was placed on simply the cultural practices involved in growing the crops and not the educational potential the garden experience may have on teaching and learning curricular concepts outside of the agricultural science curriculum. The former Principal received a grant from the Inter-American Development Bank (IDB) in 2006 to upgrade the school garden and farm, but to date, it is the opinion of the current Principal that these valuable assets remain underutilized by teachers. Recently, with the advent of the Continuous Assessment Component of the SEA, primarily the Agricultural Science component, teachers have shown a renewed interest in the garden. However, they are still hesitant to try new strategies that incorporate Garden Based Learning into their cadre of approaches to curricula enactment. Although teachers are aware of the school's administration support of the use of GBL, they believe the support still remains mainly at the level of talk.

While it is not completely clear why teachers remain hesitant to use GBL, through casual conversation, this researcher observed that teachers possessed a myriad of concerns relating to the use of this curriculum innovation. Some were hesitant to use the strategy mainly because they did not know how to effectively utilize GBL to deliver concepts from various subject areas, while others simply did not buy into its effectiveness. It is necessary to comprehend teachers' concerns about an innovation as their perceptions and feelings about it will determine their

reaction to the educational change. Consequently, this will influence the implementation of the innovation as teachers are, in fact, the true implementers of this change.

Justification of Study

Generally, the majority of school gardens around the country are in a dire state of disrepair and neglect. Although efforts are being made to encourage the use of GBL at Green Thumb Primary, teachers remained hesitant to try this approach in a more formal way, resulting in the underutilization of the school's significant investments in agricultural resources. The potential for GBL to contribute to a greater appreciation for food security and ecological literacy seems to be significant. If teachers concerns about the utilization of the GBL approach can be determined through this research, future efforts to implement such an innovation will be better informed.

Statement of Problem

Facing a global food crisis, many countries are re-evaluating their food security policies. Consequently, efforts in promoting sustainable development, ecological literacy and food security have impacted on all sectors of their societies, including education. Although our country shares similar aspirations, the enactment of our national primary school curriculum does not mirror these goals in most cases. The school under investigation has made significant investments in upgrading the school garden facilities; however, these facilities remain underutilized by teachers although many teachers were exposed to GBL as a teaching strategy and the Administration fully supports its use.

Purpose of the Study

There is a need to determine why teachers at Green Thumb Primary are not using the available resources to implement the GBL innovation by assessing their stages of concern in order to gain insights into the true nature of these concerns. As the nature of these concerns is not known by administration, the precise nature of support or structures to aid or hasten its adoption is not known.

Research Questions

Overarching

At what Stages of concern are teachers at Green Thumb Primary, with respect to the implementation of the GBL innovation as a strategy to support curriculum delivery and promote ecoliteracy?

Sub questions

1. How conversant are teachers about the application of the GBL innovation in their classroom?
2. What are teachers' perceptions about the use of GBL as a strategy to support curriculum delivery and promote ecoliteracy?
3. What are the challenges that teachers' perceive will inhibit the implementation of the GBL innovation at Green Thumb Primary?

Challenges to the conduct of the study

Limitation and Risk

Due to the researcher's immersion in the research environment, reporting bias-free information was a challenge. Consequently, the researcher was cognizant of the importance of acknowledging the values he brought to the study as he interpreted the concerns of the participants.

Delimitations

This study was restricted to one rural primary school in North East Trinidad. Consequently it explored a single case bounded by time and context. Consequently, generalizability was severely limited in this research. However, Erickson (1986) posits that generalizability of findings is not a suitable objective for interpretive research (cited in Merriam, 1998, p. 210). Instead, qualitative researchers should strive for the transferability of findings to comparable situations and context.

Significance of the Study

To date, the researcher has not found any study in Trinidad and Tobago that has examined the concerns of primary school teachers with respect to the implementation of Garden Based Learning using the Hall and Hord's (2006) Concerns Based Adoption Model. In fact, this researcher has observed that there is paucity in the research annals in the Latin American and Caribbean region with respect to Garden Based Learning, even though the potential for this curriculum innovation to promote food security and ecological literacy in the developing world

seems to be quite significant. The study will provide the school's administration with invaluable information about the possible reasons why school resources, primarily the agricultural infrastructure were underutilized by teachers. Since concerns and perceptions of key stakeholders are significant to the effective implementation of a curriculum innovation, it is imperative to ascertain how teachers perceive this innovation and what strategies can be used to promote its use at this school. It is also hoped that this study will contribute to the limited knowledge-base regarding the use of Garden Based Learning in education in the Caribbean Region.

The study will also be significant in providing the school's administration with information to determine who is ready for the change that this innovation will bring to the institution since it is unclear to the school's administration why teachers have not embraced the use of GBL- what teachers perceive may have hampered their adoption of it, and the supports they believe are necessary to enable its use. The study also highlighted teachers' concerns that, if not addressed may hinder the successful implementation of a formal GBL approach at the school in the foreseeable future.

Operational Definitions

Garden Based Learning

Garden-based learning is an educational strategy that utilizes school gardens to supplement instruction in a variety of disciplines. GBL provides an atmosphere that incorporates hands-on activities and strengthens academic, personal, and social skills allowing children to develop life skills in areas such as nutrition, leadership, and decision making.

Concerns

The composite representation of the feelings, preoccupation, thought, and consideration given to a particular issue or task (Hall, George & Rutherford, 1979 cited in Hall & Hord, 2006, p. 139)

Experiential Education

A process through which a learner constructs knowledge, skill and value from direct experiences. (AEE, 2002 cited in Desmond, Grieshop & Subramaniam, 2004 p.22).

Ecological literacy

Ecological literacy (also referred to as eco literacy) is the ability to understand the natural systems that make life on earth possible. To be ecoliterate means understanding the principles of organization of ecological communities (i.e. ecosystems) and using those principles for creating sustainable human communities (Capra 2001).

Organization of the Report

The following is a synopsis of how the succeeding chapters of the paper are organized. A brief synopsis of the existing research findings on the effects of GBL on teaching and learning as well as a brief examination of the factors that affect GBL integration in the classroom is presented in Chapter Two. Chapter Three presents a comprehensive outline of the methods that were utilized to collect and analyse the data. The analysis of the data and the discussion of findings are presented in Chapter Four and the final conclusion and recommendations are presented in Chapter Five.

CHAPTER TWO

Literature Review

This study sought to investigate the concerns of three teachers regarding the use of GBL as a strategy for teaching and learning at Green Thumb Primary in North East Trinidad. It is generally believed that the use of GBL in contemporary educational practice has the potential to enrich basic education in all cultural settings (Desmond, Grieshop & Subramanian, 2004). Desmond et al. (2004) posited that GBL is much more than an instructional strategy that utilizes a garden as a teaching tool. They asserted that GBL has the potential to transform contemporary education from a sedentary, sterile experience to one that is more engaging of the whole child. Over the years, many studies were conducted to examine the effect of GBL on the teaching and learning discourse as well as its invaluable contribution to the inculcation of ecoliteracy and nutritional awareness in the minds of young children. At the heart of the implementation of this innovation in the local educational landscape are teachers and their concerns. The current literature on GBL as well as studies on teachers concerns will be reviewed and discussed under the following themes: (a) Foundations of GBL (b) Benefits of using GBL in Primary education (c) Impact of GBL on the ecological literacy of students (d) Contemporary concerns about GBL (e) Assessment of teachers' concerns about GBL using the Concerns Based Adoption Model (CBAM).

Foundations of GBL

Bailey (1909) contends that education should open a child's mind to his natural existence, foster his sense of responsibility and independence, guide him to respect the earth and its limited resources, teach him the responsibilities of citizenship, interest him empathetically in the professions of men, touch his connection to human life in general, and touch his imagination with the spiritual forces of the world. These early twentieth-century words were articulated with the aim of studying nature in mind. It is evident therefore, the idea of incorporating the natural environment as an essential part of the child's educational curriculum is not new. The philosophy that underpins garden-based learning is actually an amalgamation of the philosophies underlying experiential education, ecological literacy, agricultural literacy and environmental awareness. Consequently, it includes teaching children by a method where they learn and explore through personal discovery, teaching them in a natural setting such as the school garden where they acquire knowledge about ecological principles that govern all life. These experiences can inculcate an awareness and appreciation of the physical environment, and nurturing within them a sense of connectedness with their environment and all that grows and flourishes within it.

Benefits of using GBL in Primary Education

The popularity of GBL programmes has been steadily increasing in the global educational landscape. Numerous programmes in both formal as well as informal educational settings with a myriad of strategies and evaluated impact studies exist. While much of the literature on garden-based programmes has placed emphasis on practical approaches for starting and managing school gardens, advocates of children's garden programmes elucidated on the multiple

developmental benefits that school gardens can have on children – mainly, emotional, aesthetic and even spiritual, in addition to the more evident social and intellectual benefits.

Sealy (2001) cited the following four reasons to justify the use of GBL as a teaching method:

> "*High retention rate:* When children work in gardens, 90 % of their experience may be classified as 'hands-on'. In a study conducted by Bethel Learning Institute on student retention in 2001, it was found that learning by doing produced 75 % retention rate and 90 % retention rate if the student teaches another student, as opposed to 11% for lectures.
>
> *Empowerment:* A connection to the earth gives students a sense of achievement and motivation. Also, by providing students with real-life results, school garden instruction promotes a sense of personal achievement and pride that motivates the thirst for greater knowledge.
>
> *Academics:* Science, maths, social studies, art, language and any other subject can be taught as life skills using nature as the learning laboratory, making these concepts more meaningful.
>
> *Teamwork:* Facilitating co-operation and communication in a real-world setting rather than a classroom, makes learning teamwork possible, as does the class goal of a successful garden become more significant than individual achievement."

Studies done on the psychological development of young children by Sobel (1996) yielded the following framework for introducing GBL to an elementary school curriculum:

> 1. Development of Empathy: Empathy development between the child and the natural world was the objective for children ages 3 to 7. This connectedness to the natural world provided the foundation to the understanding that everything is interrelated. Stories,

songs, close encounters with plants and animals, and seasonal celebrations were suggested.

2. Facilitating Exploration: Exploration was the primary focus for students from ages 7-11. This was the time to immerse children in the physical and natural world. Constructing forts, creating small imaginary worlds, hunting and gathering, following streams and pathways, making maps, gardening, and shaping the earth were all recommended activities during this stage.

3. Advocacy: Social Action was recommended for students from age eleven and extended beyond age fourteen. While woods, parks and playgrounds were the landscapes of middle childhood, adolescents wanted to engage with the larger community. Curricula that focused on environmental problems was most successful when it started in fifth and sixth grade, however, the fact it should be grounded in the local context is heavily emphasized.

In summary, it is evident that garden based learning has been viewed as contributing to all aspects of primary education, including academic skills, personal empowerment, and team building. The impact of GBL on student awareness of the wider community and environment has also been revealed by the literature. This form of ecological literacy augers well with environmental mandates outlined by many developing nations that place sustainable development at the top of their environmental agendas.

Impact of GBL on the ecological literacy of students

Smoak and Williamson (1999) noted that the GBL approach has also been shown to promote ecological literacy and the teaching of scientific concepts. Their award-winning Down-to-Earth programme in North Carolina for example, aims to provide this approach to learning with the help of school gardens as a knowledge building tool. The main purpose of the Down-to-Earth programme was to introduce youth to sustainable agriculture and environmental education using the scientific method as a conceptual and hands-on learning process that stressed critical thinking, reasoning and problem-solving. Youth educators drew on rich mixture of multidisciplinary topics such as agriculture, natural resources, environmental management, health and human safety, and horticulture. The impact of the Down-to-Earth programme was evident through increased knowledge of scientific methods, plants, fertilizer and pests, as well as positive attitudinal and behavioural changes, increased awareness and facilitation of higher order thinking processes.

With similar goals of achieving an interdisciplinary approach to environmental education, Project Green incorporated the school garden and gardening activity into all disciplines, including maths, science, English, history, social studies, and art (Skelly & Zajiceck, 1998). An evaluation of the project which brought together schools and communities across the United States, comparing experimental and control groups found that children in the experimental group, who participated in the garden programme, had more positive environmental attitudes, with second graders showing higher scores than fourth graders. More specifically, it was found that the more out-door related activities a child experienced, the more positive environmental score they recorded.

School gardens have been used to teach children about nutrition and how to make healthier food choices (Lineberger & Zajiceck, 2000). In a garden project entitled Nutrition in the Garden, teachers were guided to integrate nutrition education as it relates to fruits and vegetables. Evaluations of students participating in the programme showed that their attitudes towards fruit and vegetables had become more favourable, and they were also more likely to choose fruit or vegetables as snacks than before they participated in the gardening programme.

In a garden project with similar goals described by Canaris (1995) the impacts of the garden led to more benefits than the original aim of improving nutrition and nutritional awareness in children. The gardening activities enhanced the quality and meaningfulness of their learning on a wider level, with children communicating with their communities and parents as well as learning mathematical and scientific principles in the garden.

Contemporary concerns about GBL

Many contemporary authors suggest GBL can have a significant positive influences on the student (Desmond, Grieshop & Subramanian, 2004). However, critics of the innovation continue to ask why greater institutionalization of the pedagogy in mainstream education has yet to be realized. Desmond et al. (2004) provided several possible elucidations on this issue. First of all, they posit that the pedagogy has not been fully examined from a critical perspective or endorsed by educational researchers and practitioners. Teachers may not use the GBL approach because there is paucity in empirical data to support its effectiveness. Secondly, they contend there is no established discipline in GBL that links it to Problem Based Learning, effective experiential education, and improvement in academic performance. Akin to that inadequacy is the lack of infrastructural support for school gardens or related GBL efforts. Finally, strategies to sustain the physical garden site as a permanent part of the school's physical and educational landscape seem to be lacking in most schools in the United States. They argue that while school athletic programmes often receive major school and community investment there are limited examples of comparable support in the fields of environmental education or GBL.

From a concerns perspective, only a few studies in school garden and agricultural education have embraced CBAM as a conceptual framework for the study of curriculum innovations (Bellah & Dyer 2009). Petrea (1994) stated that agriculture teachers in Illinois voiced intense concerns about the significance of an agricultural science curriculum for students and how the innovation would influence student outcomes (impact concerns). In that study, teachers' second highest level of concern was related to the demands of the innovation and the instructor's role with the innovation (personal concerns). Ohene-Adjei (1995) described similar concerns from Illinois

teachers using new agricultural science curricula, indicating that those concerns (personal and impact) may have implications for teacher buy-in in the long term.

In another study, the concerns of science teachers using a constructivist approach to teaching science with real-life experiences as the context for teaching were examined. Dass (1997) identified concerns ranging from initiation of the approach to misconceptions about the terms "constructivist" and "module" (awareness and informational stages). Further, concerns about the reward structure of the school equating the level of work required (personal concerns) to concerns about deviating from the standard sequence of the grade level approach (management) were also identified. Some teachers concerns moved into the higher levels of consequence and collaboration stages (impact concerns), explicitly noting their intense feelings about the innovation's effects on student test scores. The author provided critical research analyses by underscoring the concept that fundamental reform at the classroom level is intimately connected to reform of professional development at broader levels (Dass, 1997).

Educational innovation developers commonly place substantial emphasis and resources on the development of an educational innovation (Hall & Hord, 2001).Conversely, resources for introduction, implementation, and sustained adoption of such innovations are inexplicably disproportionate. Consequently, teachers regularly find themselves personally struggling to understand and adopt newly introduced educational innovations. Traditional educational evaluative measures, when performed, serve simply to assess *if* a teacher is using an innovation. If data reveals nonuse, the innovation is deemed unsuccessful. If data indicate teacher use, the innovation is reasoned to be a success (Hall & Hord, 2001).The problem with traditional educational evaluative measures is that teacher concerns, personal or otherwise, are infrequently

considered in agricultural education curricular implementation assessments. This leaves paucity in the body of knowledge as to the nature and complexity behind innovation success or failure.

Assessing teachers' concerns about GBL using CBAM

In this study, a model of change referred to as the Concerns-Based Adoption Model or CBAM (Hall & Hord, 2006; Hall & Loucks, 1978) was used to examine three primary school teachers' concerns, feelings, and perceptions as they seek to adopt Garden Based Learning , an inquiry-based approach to teaching and learning in their cadre of approaches to curriculum implementation. In particular, one aspect of the model was used, stages of concern, to analyse the nature of concerns expressed by the teacher participants at the initial stage of the adoption process.

The Concerns-Based Adoption Model

Hall and Hord (2006), borrowing from earlier work, define a concern as "the composite representation of the feelings, preoccupation, thought, and consideration given to a particular issue or task . . .[and includes] the mental activity composed of questioning, analysing, re-analysing, considering alternative actions and reactions, and anticipating consequences" (Hall, George, & Rutherford, 1979, p. 5). Researchers at the Research and Development Centre for Teacher Education of the University of Texas at Austin revealed that educators, who were involved in innovation processes, expressed particular concerns about adopting various educational innovations. These concerns were equated to those noted by Frances Fuller (1969). She advanced that one's feelings and perceptions about an innovation could be viewed as concerns which move through four levels: unrelated, self, task and impact (Hall & Hord, 2006).

These levels were later developed into what is now known as the Stages of Concern (SoC). Although there are three analytic instruments of the CBAM user system (Stages of Concern, Levels of Use and Innovation Configurations), this study only incorporated the SoC and as such, only this tool will be discussed.

Within the SoC framework, seven stages of user categories can be identified. They range from stage 0 to 6. The stages and concerns are summarized in Figure 1.

Figure 1. Stages of Concern. This figure illustrates typical expressions of concern about an Innovation

IMPACT	6	Refocusing	I have some ideas about something that would work even better
	5	Collaboration	I am concerned about relating what I am doing with what my co-workers are doing
	4	Consequence	How is my use affecting clients?
TASK	3	Management	I seem to be spending all of my time getting materials ready
SELF	2	Personal	How will using it affect me?
	1	Informational	I would like to know more about it
UNRELATED	0	Awareness	I am not concerned about it

(Adapted from Hall & Hord (2006), p. 139).

In a study conducted by Kelly and Staver (2005) the SoCQ was utilized in order to understanding the process of implementing a new K-6 science curriculum. The results indicated that after two years of implementation of the new program, teachers still possessed personal concerns while there was a decrease in teachers' management concerns. Teachers also continued to have high refocusing concerns (Kaplan, 2011). This suggests that teachers had high self-concerns that needed to be addressed.

By formally assessing the stage(s) of concern of individuals, major implications for curriculum implementation can be identified. Hall and Hord (2006) posit that interventions executed in an attempt to facilitate the change process need to be aligned with the concerns of those who are a part of the change process. Consequently, evaluating their stage(s) of concern is imperative. Further, they go on to say that, assessing the Stages of Concern and using the techniques of assessment outlined in the CBAM framework can lead to significantly more effective individual to individual training sessions, more pertinent workshops and strategic plans that take into consideration the personal side of the change process.

In another study, the SoCQ developed by Hall and Loucks (1979) was used to determine how public school teachers felt about the implementation of a new 4/4 block scheduling program in schools in certain districts in the state of North Carolina. SoC questionnaires, attached to cover letters that included researcher-addressed stamped envelopes, were mailed to each participating school and distributed by an identified person attached to the specific school. This approach achieved a 71 % return rate. The data collected revealed that "consequence was the peak stage of

concern for the largest percentage of responders, and collaboration was the peak for the second-largest percentage" (Williams 2001, p 2.). Her research went on to show that teachers who possess less work experience had higher informational concerns compared to their peers with more years of teaching experience. This information proposes that teachers were active change implementers, simultaneously sharing information with each other that would work in the best interest of their students.

Determining teachers' stage (s) of concern may be valuable during the implementation of any innovation in education. The information obtained can determine the necessary interventions that are required for a successful process. In fact, Hall and Hord (2006) pointed out that the architects of CBAM declared that if individuals are provided support based on their particular Stage of Concerns and Levels of Use, the change process can be led and guided in ways that personalizes the experience. They further stated that if the change-facilitating interventions are appropriate, timely and address the client's particular concerns, the process can be successful for all.

CBAM allows change facilitators—those who provide assistance in the adoption process—to probe the innovation users and nonusers with three key diagnostic tools. Those tools relate to user stages of concern, levels of use, and innovation configurations as measures to match resources with the needs of the users (Hall & Hord, 2001). Although studies may be carried out with all the diagnostic tools together, the tools may also be used individually or in various combinations. This study utilizes the Stages of Concern (SoC) component of CBAM as teachers' concerns are at the core of this research.

The stages of concern component of CBAM relates directly to how teachers perceive the educational innovation they are asked to implement (Willis, 1992). CBAM's seven stages of concern include awareness, informational, personal, management, consequence, collaboration,

and refocusing. These stages span the areas of little concern, knowledge, or involvement in an innovation to a teacher's focus on further exploration of more universal benefits or alternative forms of the innovation (Hall & Hord, 2001).Contrary to other, more linear views of change concerns, CBAM recognizes that although a person's focus of concern may shift from one stage to another, it does not indicate that the previous stage of concern is alleviated (Willis, 1992).

There are three techniques for assessing the SoC of the user of an innovation; they are: i) one-legged interview, ii) open-ended concerns statement and iii) Stages of Concerns Questionnaire (SoCQ). This study utilizes one-legged interviews and the Stages of Concerns Questionnaire (SoCQ).

CHAPTER THREE

Methodology

The current study sought to determine teachers' concerns regarding the use of GBL as a strategy for teaching and learning. The study adopted a qualitative research design in the form of a case study and its focus was three teachers from a denominational primary school in north east Trinidad.

Rationale for Qualitative Approach

For the purpose of this research, an exploratory case study methodology as outlined by Yin (1993) was utilized. Consequently, this study attempted to explain why certain behaviours occurred by determining the causes and effects. This approach, within the qualitative paradigm, has certain underlying philosophical assumptions that implicitly guided every aspect of this study. These were the ontological, epistemological, axiological and rhetorical assumptions which formed the basis of this study.

First of all, this case study explored the interplay of all possible variables in order to provide as comprehensive an understanding of the situation as possible. To gain an in-depth understanding of the myriad of possible concerns teachers may possess about the use of GBL, the idea of multiple realities was embraced. Pring (2000) noted that the language/voice of the participants must be used to describe their situation otherwise it would not be their situation that is being investigated. In other words, the reality of the inquiry has to be the reality as it is determined

by the participants in their contexts. Consequently, this research was predicated upon an interpretivist paradigm (Guba & Lincoln, 1994) which supports the notion that there are multiple realities, not single realities of phenomena, and that these realities can differ across time and place. The ontological assumption here was that different teachers at various levels will have individual stories based on their unique realities resulting in different perspectives being presented from each participant. Teachers' personal and professional experiences in Garden Based Learning as well as their individual philosophies on teaching using the school garden as a classroom all contributed to rich and diverse and personal perspectives, leading to a more comprehensive understanding of their concerns.

Secondly, the epistemological assumption within this discourse was predicated on the notion that the researcher will attempt to lessen distance between him and the issue being researched. Conducting research in Green Thumb Primary placed the researcher in the field where the participants work and interact. This allowed the researcher to acquire a deeper knowledge base of the participants from a first-hand perspective. This immersion in the field allowed the researcher to observe the teacher's levels of use of the Agriculture infrastructure and conduct interviews with teachers both with the view of identifying possible themes that may emerge from this exploration. A myriad of data sources allowed for deeper exploration and unlike more statistically-based studies which search for quantifiable data, the goal of this case study was to offer new variables and questions for further research into the implementation of the GBL innovation. According to Hammersley (1995), while statistical methods are concerned with the distribution of a particular trait, or a small number of traits, in a population, the case study is concerned with the whole variety of traits to be found in a particular instance.

Thirdly, it was acknowledged that this case study was value-laden. As such, the axiological assumption here was that the researcher must position himself to actively report his values and biases as well as the value laden nature of the data gathered in the field (Creswell, 2007). Having an Agricultural Science background and frequently using GBL lessons in my classes, this researcher was aware of and reported on the biases he brought to this research. Similarly, each participant possessed their own value system, beliefs and opinions on the utility of GBL in the classroom.

Finally, this case study embraced the rhetorical assumption that the writing will be personal and literary in form instead of using quantitative terms such as "internal validity", "external validity", "generalizability", and "objectivity", the researcher writing this case study employed terms such as "credibility", "transferability", "dependability", and "confirmability" (Guba & Lincoln 1985).

According to Creswell (2007), seldom does one see an extensive "Definition of Terms" section in a qualitative study, because the terms as defined by participants are of primary importance. This researcher believed that the language of the research had to be personal, literary and predicated on the evolution of definitions by the participants over the period of the study, rather than being determined by the researcher.

Data Collection Strategy

Research Design

This exploratory case study sought to assess the concerns three teachers possess with regard to the use of GBL as a strategy for teaching and learning. A Case study was an ideal methodology when a holistic, in-depth investigation was needed (Feagin, Orum, & Sjoberg, 1991). Since this study sought to garner teachers' concerns about this innovation an exploratory case study was the most appropriate research design. The study employed the Stages of Concern questionnaire (see Appendix B) as well as one-legged semi-structured interviews. According to Hall and Hord (2001), determining a person's stage of concern can be as simple as asking questions. Educators can be approached informally during a chance meeting in the corridor or lunchroom, in what Hall and Hord referred to as a "one-legged interview." The informal questions of one-legged interviews are the most productive. It was recommended that the questions should be fairly specific: *How do your students respond to lessons taught in the garden setting*? It is believed that this method will facilitate more rich description of the teachers' concerns and experiences of the phenomenon and their views on the GBL innovation where implementation is concerned.

Data collection instruments

The Stages of Concern (SoC) Questionnaire (Hall, George & Rutherford, 1979) was the main instrument of data collection. One-legged, semi-structured interviews were conducted over a period of two weeks and the average length for each interview was 20 to 25 minutes. The

interview protocol was derived from the SoC questionnaire so both worked in tandem. Each interview was audio-taped and transcribed.

Sampling Design and Procedure

As espoused by Patton (2001), criterion sampling, which involves selecting cases that meet some predetermined criterion of importance, was used to select participants for the study. Sampling, as it relates to the research process, deals with the selection of individuals, units, and/or settings to be studied. While quantitative studies aim for random sampling, qualitative studies such as this research, used purposeful or criterion-based sampling, that is, a sample that had the characteristics relevant to the operationalization of the research question(s) (Nastasi, 1998).The sample consisted of three teachers from the school who were selected based on the criteria that they teach at different levels at the school, have prior knowledge of the GBL innovation and were willing to participate in the study. It is believed that participants with these characteristics will be able to purposefully inform an understanding of the research problem and central phenomenon in the study (Creswell, 2007).

Procedure for Data Analysis

Stages of Concern Questionnaire

The Stages of Concern Questionnaire (SoCQ) utilized a Likert scale format to measure seven hypothesized stages of concerns the respondents have toward change associated with the implementation of an innovation. The questionnaire contained 35 statements (five statements for each stage) that allowed respondents to describe a concern they possess on a scale of 0 to 6. A

response of 0 indicated a very low concern; a response of 6 indicated a very high concern. The SoCQ instrument is illustrated in Figure 2 with the statements categorized by stages with the accompanying item number on the instrument as presented to respondents. The Stages of Concern Quick Scoring Device (Griffin & Parker, 1998) (see Appendix F) was used to hand score the Stages of Concern Questionnaire (SoCQ) responses and to plot an individual profile. This device is particularly useful when only a small number of questionnaires need to be managed or when computer processing is not accessible. By following the step-by-step instructions, responses from the SoCQ were transferred to the device, entered into seven scales, and each scale was subsequently totalled. Then the seven raw scale score totals were translated into percentile scores and plotted on a grid that produced the individual's SoCQ profile (see Appendix F). This profile was analysed on different levels and compared with a typical non-user profile as espoused by Hall and Hord (2001) for further analysis.

Figure 2. A Table showing Stages of Concern Questionnaire items, grouped by stages.

Stage 0 - Awareness	
Item #	Statement
3	I don't even know what is.
12	I am not concerned about this innovation.
21	I am completely occupied with other things.
23	Although I don't know about this innovation, I am concerned about things in the area.
30	At this time, I am not interested in learning about this innovation.
Stage 1 - Informational	
6	I have a very limited knowledge about the innovation.
14	I would like to discuss the possibility of using the innovation.
15	I would like to know what resources are available if we decide to adopt this innovation.
26	I would like to know what the use of the innovation will require in the immediate future.
35	I would like to know how this innovation is better than what we have now.
Stage 2 - Personal	
7	I would like to know the effect of reorganization on my professional status.
13	I would like to know who will make the decisions in the new system.
17	I would like to know how my teaching or administration is supposed to change.
28	I would like to have more information on time and energy commitments required by this innovation.
33	I would like to know how my role will change when I am using the innovation.
Stage 3 - Management	
4	I am concerned about not having enough time to organize myself each day.
8	I am concerned about conflict between my interests and my responsibilities.
16	I am concerned about my inability to manage all the innovation requires.
25	I am concerned about time spent working with nonacademic problems related to this innovation.
34	Coordination of tasks and people is taking too much of my time.

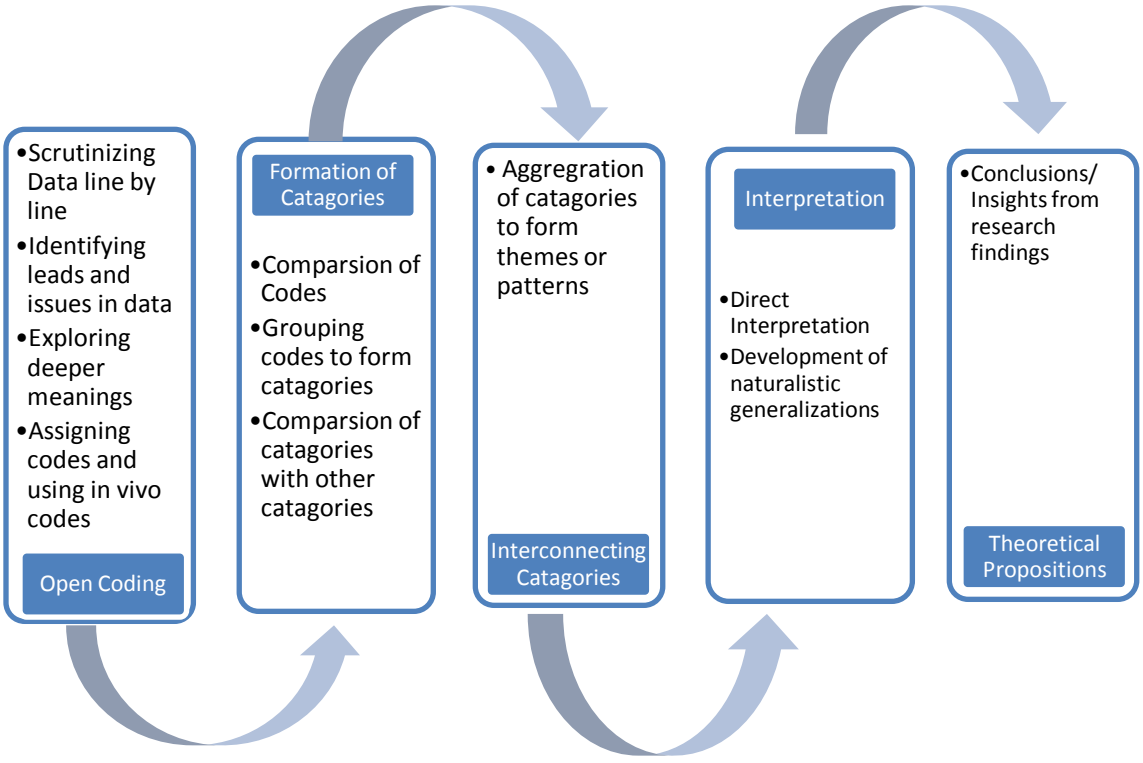
Stage 4 - Consequence	
1	I am concerned about students' attitudes toward this innovation.
11	I am concerned about how the innovation affects students.
19	I am concerned about evaluating my impact on students.
24	I would like to excite my students about their part in this approach.
32	I would like to use feedback from students to change the program.
Stage 5 - Collaboration	
5	I would like to help other faculty in their use of the innovation.
10	I would like to develop working relationships with both our faculty and outside faculty using this innovation.
18	I would like to familiarize other departments or persons with the progress of this new approach.
27	I would like to coordinate my effort with others to maximize the innovation's effects.
29	I would like to know what other faculty are doing in this area.
Stage 6 - Refocusing	
2	I now know of some other approaches that might work better.
9	I am concerned about revising my use of the innovation.
20	I would like to revise the innovation's instructional approach.
22	I would like to modify our use of the innovation based on the experiences of our students.
31	I would like to determine how to supplement, enhance, or replace the innovation.

Source: Hall, G. E., George, A.A., and Rutherford, W. A. (1998). Measuring stages of concern about the innovation: A manual for use of the SoC questionnaire (p. 25).

Interview Data

For this case study the Constant Comparative method of data analysis, as outlined by Glaser and Strauss (1967) was used. The following flow diagram illustrates the various steps that were adopted in the data analysis process:

Figure 3. Diagram illustrating the Constant Comparative approach to data analysis used in this case study.



Throughout the entire process, a constant comparative method was employed where data was compared with data, data was compared with a category and a category was compared with other categories. Peer coding was also utilized as a form of triangulation.

Procedure for Ensuring Validity and Reliability

To ensure the credibility of the study, school's administration was approached for permission to conduct the study and contact was made with the potential participants to acquaint them with the nature and purpose of the study (see Appendix A). Once participants were identified, dates for the conduct of the interviews were discussed and confirmed and all interviews were conducted over a three-week period. Subsequent interviews were conducted for confirmation of the data obtained during the initial interviews as well as for clarification of any issues identified during the transcription and initial analysis of the data. Peers at the School of Education were also approached to review the transcripts and initial analysis of the data to ensure that all interpretations remain true to the specified views of the participants. Thus, member-checking and peer review were employed to enrich the credibility of the process. It was believed these facilitated objectivity, ethical diligence and rigor (Camara, Drummond & Jackson, 2007).

CHAPTER 4

Data Analysis and Interpretation

Methods of Data Collection

This study sought to investigate the concerns of three teachers regarding the use of GBL as a strategy for teaching and learning at Green Thumb Primary in North East Trinidad. By drawing on data collected from the SoC questionnaire and interviews with participating teachers, data was collected over a three week period during the month of March 2013. Data collection took the form of one-legged semi-structured interviews each lasting approximately 30 minutes as well as via the distribution of the SoC questionnaire. Participants were again reminded of the nature and purpose of the study and offered the option of withdrawal at any time. The interview questions were framed to elicit data on teachers concerns regarding the use of GBL as a strategy for teaching and learning. All interviews were digitally recorded and were transcribed verbatim as it is believed that this method of transcription provides the ideal database for analysis (Merriam, 1998). Preliminary analysis of the data began during the interview with the researcher making brief memos and narratives as the data was being transcribed. Each participant was given the opportunity to fully review the transcript of the interview data in order to verify the accuracy of the content to ensure that it was reflective of what they intended to say. Subsequent follow-up interviews, each lasting no more than five minutes, were conducted during the second week of April 2013 in order to verify the data obtained in the initial interview as well as to give participants the opportunity to adjust or add to that data if they so desired.

The second interview was also used to seek further clarification and deeper elucidations of issues that emerged during the transcription and preliminary analysis.

The participants

The sample for this study consisted of three teachers from the selected institution. All three participants are tertiary trained teachers each with over five years teaching experience at the institution under study. One of the teachers was a past student of the institution under study and as such has a working knowledge of the history and culture of the school. All teachers have had exposure and training related to the use of student centred pedagogical practices such as Garden Based Learning in the delivery of the curriculum for the various levels and subject areas they teach. The following provides a brief description of the teachers who participated in the study.

Mrs R has been a teacher at the institution for eight years and has been growing crops with her students every year at the school. She encourages her students to plant vegetables that they can use in their homes in order to supplement their family's diet and limited household incomes in most instances. She uses the process of growing crops to teach Science, Agricultural science, Mathematics and Social Studies by linking the gardening process to curricula objectives. She also uses the school pond and animals in her teaching to expose students in an authentic way to food chains and environmental awareness. She also relates her assessments and evaluations to the experiences the students had in the garden. She is currently a standard three teacher and previously taught infants and standard one.

Mr P has been a teacher at Green Thumb primary for thirty two years. For the past five years he has been assigned to the position of 'Agricultural Science' teacher. His classroom is located in the newly built agriculture building. He has a timetable which includes all classes at least once a week. During his class, students are exposed to the agricultural science syllabus as well as practical activities which include the growing of crops in beds and in self-watering containers (a

compulsory part of the CAC) as well as the rearing of animals (Rabbits) and aquaculture (Tilapia). As a specialist teacher, Mr P is not assigned to one class. With over thirty years of experience as a primary school teacher, Mr P has used various methods including GBL to deliver the curriculum to his students. Apart from the agricultural science curriculum, Mr P is also approached by teachers to teach Science and Social Studies content in the garden setting.

Miss C is the newest member of staff. She has been teaching at the standard four level for the past three years. Her major focus has been preparing students for the SEA examinations. Her students are rarely exposed to the garden experience except when they participate in fund raisers. Last term her students grew lettuce and sold them to raise funds for the graduating class. Miss C used this exercise to reinforce some mathematics and science concepts and revealed that the students scored well in these areas in their end of term examinations. Some of her students work with the Agricultural Science teacher during the lunch time to assist with various tasks on the farm such as weed control, feeding animals and selling fruits and vegetables when they are harvested.

All the teachers in this study have used various facets of Garden Based Learning in their classes but in a very limited way. They have indicated a desire to expand its use in a more structured and cohesive manner with each other. In addition, all teachers continue to receive support and encouragement for the schools' administration to make better use of the agricultural resources available to them as students are seen to show a great interest in activities involving the school garden.

Ethical Considerations

Both the participants and the administration were informed as to the nature and purpose of the study. From inception, written informed consent was obtained from selected participants as well as the administration of the institution prior to the collection of data. Participants were assured that the identities of both the institution and the teachers will be held in the strictest confidence and that the data obtained from the study will be used exclusively for the specified purpose. Convenient dates and times were agreed on for the conduct of the interviews so as to prevent significant disruption of the teachers' timetabled classes. All participants were assured of confidentiality and anonymity and were given the opportunity to withdraw from the study at any time. Permission to utilize the actual words of participants in the presentation of the findings was also requested.

Strategies to Ensure the Trustworthiness of the Data

Although the trustworthiness of qualitative research is often questioned by positivist researchers, various strategies were embraced to ensure the credibility and dependability of the findings (Shenton, 2004). First of all, the researcher adopted some of the strategies proposed by Creswell (2007) to ensure the trustworthiness of the data collected. As suggested by Guba and Lincoln (1981), the adoption of well-established research methods both in qualitative investigation in general and in information science in particular ensures that specific procedures employed, such as the line of questioning pursued in the data gathering sessions and the methods of data analysis are derived, as close as possible from those that have been successfully utilised in previous

comparable projects. Yin (1994) recognises the importance of incorporating correct operational measures for the concepts being studied. Consequently, using the CBAM framework the researcher employed specific procedures and instruments such as the Stages of Concerns Questionnaire for data collection and procedures outlined in the CBAM model to analyse the data obtained. Secondly, triangulation was also employed to ensure the validity of information being provided by participants. Data from the SoC questionnaire was compared with interview data and member-checking was used to triangulate the data. According to Guba (1981) as well as Brewer and Hunter (1989) the use of different methods in concert compensates for their individual limitations and exploits their respective benefits. Thirdly, Iterative questioning as proposed by Shenton (2004) was also utilized as a means of verifying the information being provided by participants. Questions were rephrased and re-presented so that responses could be equated for consistency. Generally, the researcher utilized the actual words of the participants when analysing and coding the data in order to ensure that the meanings obtained remained true to the voice of the participants. Renner and Taylor-Powell (2003) posit that this allows the themes and categories to emerge from the data rather than having the researcher impose preconceived notions on the data. Member checking of interview transcripts, emergent codes and preliminary findings was used as a means of ensuring the credibility of the findings. Lincoln and Guba (as cited in Creswell, 2007, p. 208) argue that this is "the most critical technique for establishing credibility". Finally, peer review, which provides an external check on the research process (Merriam, 1998), was also used to ensure the credibility and trustworthiness of the findings. Codes and categories that emerged during the analysis as well as the initial interpretations were given to peers from the School of Education for critique and comments.

Data Analysis Strategy

Analysis of data obtained from SoC Questionnaire

The Analysis of data obtained from SoC Questionnaire was built on procedures outlined in Measuring Stages of Concern about the Innovation: A Manual For Use of the SoC Questionnaire (George, Hall, & Stiegelbauer, 2006). Data obtained from each SoC Questionnaire was entered into an Excel spread sheet to obtain raw scores that were specifically representative of concerns that were prominent at a specific level of concern. The raw scores for the seven levels of the SoC Questionnaire were converted to normed percentiles. The SoC Questionnaire has predetermined normed percentiles as a feature of the questionnaire. The percentiles were used to build and compare the profiles of the individual participants. After the data was collected and processed, the data was interpreted at several different levels of detail and abstraction using the manual for SoC Questionnaire (George et al, 2006). A rich clinical picture of each of the three participants was obtained by examining the percentile scores for all seven stages and interpreting the significance of the highs and lows and their inter-relationships. The interpretations were compared with the interviews conducted for increased validity.

Analysis of data obtained from interviews

Interviews were conducted to gain a better understanding of the deeper concerns that led to each of the participant's concerns profile. The interview was structured to focus more on stages zero to six since the GBL curriculum was still being developed and has not been formally institutionalized at the school under study. Data transcription began with the first interview and the transcripts were subsequently reviewed by the participants and validation of the accuracy of the content was sought. Participants were free to make changes to the transcripts if they believed what was recorded was not an accurate account their thoughts.

Content analysis of the combined interviews was executed sentence by sentence in order to determine what the data was revealing and to identify themes and patterns in the data which reflected the various concerns of the participants. During the preliminary stage of analysis coding was done using QSR NVIVO 10 software. These initial codes were reviewed and refined constantly. Emergent codes were subsequently organized and grouped according to the various stages of concerns outlined in the CBAM framework (see Appendix D).

During the second phase of analysis, axial coding was carried out by constantly comparing and contrasting the initial codes and grouping those that were similar in nature to form categories (Strauss & Corbin, 1990). The emergent data was then aggregated into twenty two categories and later collapsed into six stages of concerns. Within the stages, some overlapping themes emerged that will be used to plan future change strategies. Respondent quotations from the interviews were used to support and illustrate the findings. The findings were presented and discussed based

on the group SoC profile of the participants that reflected the relative intensity of their stages of concerns (George, Hall, & Stiegelbauer, 2006) and corresponding themes identified from the interviews.

Presentation of Findings

The interpretation of the SoC scores of participants was built on procedures outlined by George, Hall, and Stiegelbauer, (2006). For the purposes of this research paper, group data were analysed on three different levels to facilitate three types of interpretations, namely: the peak stage score, the first and second highest stage score, and profile interpretations. This facilitated greater sensitivity toward the interpretation of respondents' concerns, while simultaneously presented a rich clinical picture of how some teachers as a group react to innovation and change (Holloway, 2003).

Peak Stage Score Interpretation

Figure 4 below shows a table that illustrates the peak stage scores (*) for each of the three teachers in the sample and the corresponding composite group peak stage score (average for the group). The group peak score of 94 (on the percentile scale) proposed that this group of teachers were primarily at a personal stage of concern at this point in time in the innovation implementation process. The concern that possessed the second highest level of relative intensity was revealed to be management concerns with a mean group score of 88. This pattern of relative intensity of concerns (personal followed by management) was reflected by two out of three teachers.

Figure 4. Listing of Stages of Concern Individual and Group Percentile Scores

	Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
	Awareness	Informational	Personal	Management	Consequence	Collaboration	Refocusing
Mrs. R	72	80	94*	90	76	76	57
Ms. C	72	80	92*	90	82	68	52
Mr. P	84	91	95*	85	82	72	47
Average (group)	**76**	**84**	**94***	**88**	**80**	**72**	**52**

The relative intensity of a concern was measured by the percentile ranking of the particular stage of concern. Consequently, the higher the intensity of a concern the greater was its percentile score. Hence a percentile score of 94 illustrated a high intensity of personal concerns. The score of 94 proposed that the respondents had deep personal concerns about the innovation and its consequences for them, that is, they wanted to know the personal impact of the change (Holloway, 2003).

First and Second Highest Stage Scores Interpretation

Utilizing the second highest stage of concern in the data analysis process had several merits. First of all, the main reason for including it was to determine if a general pattern was present in the data. Secondly, ―due to the developmental nature of concerns, the second highest stage of concern will be, in most instances adjacent to the highest concern (George, Hall, & Stiegelbauer,

2006, p. 34). This pattern emerged from the data, and was supported by the themes generated from the interviews. Consequently, the researcher had greater confidence in the suggested pattern. Finally, as the number of respondents in this study was only three individuals, an analysis of the second highest stage scores for such a small group was reasonably straightforward. While the group profile obtained added credence to the validity of the patterns obtained in the results above, the findings were interpreted considering assumptions about the validity and authenticity of responses to a paper-pencil questionnaire from a sample of only three respondents.

Figure 4 illustrates the group as scoring highest on Stage 2 (94) and second highest on Stage 3 (88). This proposed that the teachers had deep personal concerns about this innovation and its impact on their personal life. The data revealed that the second highest Stage 3 concerns suggested that the teachers also shared intense concerns about how the changes brought about by the implementation of the innovation will be managed when it is put into practice, that is, the group had concerns about resource availability and allocation, scheduling, time and other management issues. According to George, Hall, and Stiegelbauer (2006) it is a common occurrence for groups to have this adjacent combination of highest score on Stage 2 and second highest score on Stage 3. They posited that this arrangement might have indicated that respondents had feelings of uncertainty and doubt about whether they can master the innovation.

Profile Interpretation

Figure 5 shows the profile of the group Stages of Concerns. The profile showed a gradual increase in the intensity of the Stages of Concerns from Stage 0 through Stage 2 where the relative intensity peaked, followed by a dip in intensity at Stage 3, followed by a gradual decline in intensity through stage 5, then a sharp dip to stage 6. This pattern illustrated similarity to a nonuser SoCQ profile. Nonusers' concerns normally are highest on Stages 0, 1, and 2, and lowest on Stages 4, 5, and 6 (George, Hall, & Stiegelbauer, 2006, p. 37).

Figure 5 Profile of the group Stages of Concerns

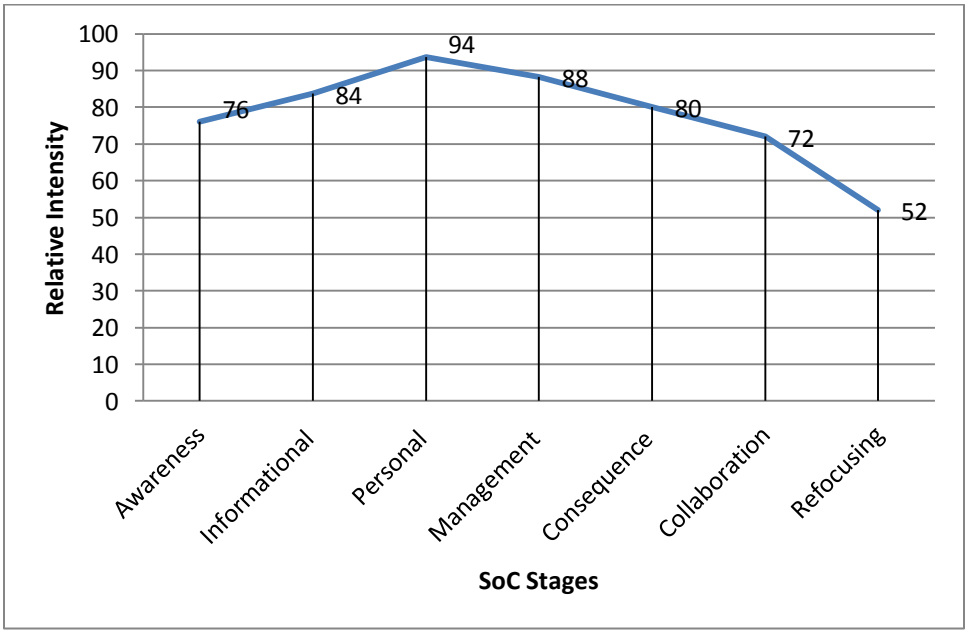


Figure 6. Table Listing of Stages of Concern Group Percentile Scores

	Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
	Awareness	Informational	Personal	Management	Consequence	Collaboration	Refocusing
Average (group)	**76**	**84**	**94***	**88**	**80**	**72**	**52**

To acquire a greater understanding of the variation illustrated in the group profile, the relative positions of Stages 1 and 2 and also the relative position of Stage 6 were examined in more detail.

Figure 6 illustrates that the Stage 2 score (94) was higher than the Stage 1 score (84).When Stage 2 concerns are more intense than Stage 1 concerns, as revealed by this sample, personal concerns seem to override concerns about acquiring a greater understanding or more information about the innovation. Even when attempts were made to engage in a discussion about the innovation with a person with this profile, the high Stage 2 concerns are intensified and the Stage 1 concerns were reduced (Hall, George, & Rutherford, 1998). In this situation, Stage 2 concerns typically must be lowered before the individual can look at the innovation with any degree of objectivity (Hall et al. 1998). This scenario revealed that the respondents' concerns about an innovation's influence on their personal position outweighed their desire to learn more about the innovation. Further analysis of the group percentile scores showed a sharp tailing-down (52 percentile score) of Stage 6 (refocusing concerns). This pattern, which is typical of a non-user profile, offered further insights about the attitude of the respondents towards the innovation. According to George, Hall,

& Stiegelbauer (2006), when Stage 6 tails down at end of a nonuser's profile, it usually means that the respondents did not have ideas that would potentially compete with the innovation.

Discussion of Findings

The concerns of three teachers from Green Thumb Primary with respect to the implementation of the Garden Based Learning innovation have been proposed within the parameters of their combined responses to both the SoCQ, and the one-legged, semi-structured interviews. Findings relating to the major concerns of the three teachers identified under the groups' peak stage scores (94 percentile Stage 2 personal concern), first and second highest stage scores (personal and management concerns respectively) and profile interpretation, will be discussed.

Peak Stage Score

From the group profile (Figure 5) it was evident that the highest stage of concern for the group was stage 2. A high stage two indicated deep personal concerns about the GBL innovation and the consequences it held for the participants on a personal level. Personal and informational concerns are what Fuller (1969) refers to as 'self' concerns where the teachers possessed an ego-centric approach to the innovation, being more concerned about what the experience of the innovation will be like for 'I' or 'me'. According to Hall et al. (1979), personal concerns are dominant when the teachers were uncertain about the demands of the innovation, their inability to meet those demands and the role they played with the innovation. While all of these concerns dwell in the 'self' area, they represented two component parts. Firstly the individual knew a little and possessed the desire to learn more about the information (stage 1 informational) and secondly, the individual was concerned about where he or she stood in relation to the Principal's

knowledge and position and the sacrifices he or she will have to make when the innovation is implemented (Stage 2, Personal). This was revealed to be a major concern for Mrs R who said that

> *"I think it's a great idea but teachers need more information and updated training if they are to implement it with some degree of success"*.

This perspective was also shared by Miss C who noted that,

> *"I know that there is a lot on information out there about GBL and we as teachers need to edify ourselves and seek new ways to bring the curriculum to life"*

This stage also encompassed a personal analysis of the individual's role in relation to the reward structures that exist within the organization, decision making and concern about possible conflicts with current structures and personal commitments. Mrs. R highlighted this concern saying that,

> *"I know that I will have to work with my students more closely as well as the agri teacher to make sure the students do what they are required to do. Because I live far from here, I know I would have to leave home a little earlier and work on some weekends, like I do now when we have to water plants and spray insecticides. And because these children come from a low socio-economic area, their parents would find it hard to put out any extra money for them to come in on weekends or make copies of worksheets and so on. I usually stand those costs for my students so I know it would be more pressure on my pocket too"*

As illustrated by Mrs R comments, the financial implications of the innovation were also a major personal factor considered by the participants. Mr P reiterated this concern by saying

> *"it's harder on me when they doing more work in the garden because although the school does give us money for some of the materials, I still have to spend my money to buy things when the crops are growing".*

A stage two peak concern also showed that the teachers were concerned about the impact of the innovation on status of self or colleagues (Hall & Hord, 2001). This was revealed by Miss C who saw her role changing with the implementation of the GBL innovation

> *"For teachers, it means adopting the role of the facilitator in more meaningful lessons and becoming more resourceful educators".*

Another theme that recurred throughout the interview process and mirrored in the SoC questionnaire was a deep concern with personal time in terms of being compensated for it and its value as a key component in making the implementation of the GBL innovation a success. Teachers devoted some of their personal time to doing projects that were based in the garden. Although they were concerned about the additional time they would have to dedicate to the innovation, they expressed a willingness to do so. Mr P reported,

> *"As it is now, I spend a lot of my personal time and energy behind garden projects. Nobody compensates me for that but I don't mind'*

He also indicated that when crops are ready to harvest he devoted more time to monitoring the garden because of issues of larceny. This was revealed in the interview when he said that

> *"We use to have a problem with some characters coming over the weekend and stealing the crops but since they build the fence and when I know it has crops ready to harvest I come in on weekends to check, the problem ease up. My time on weekends is a sacrifice*

but I put it aside because I know when the pupils don't get to harvest their crops, they get really disappointed"

The data revealed that helping teachers work through these personal concerns was crucial in ensuring that the intended changes occur, since being aware of the concerns allowed those in charge of the innovation to tailor aid given to individuals (Holloway, 2003).

First and Second Highest Stage Scores

Because of the developmental nature of concerns, the second highest Stage of Concern often will be adjacent to the highest one (George, Hall, & Stiegelbauer, 2006). As such, it was somewhat predictable that the second highest stage of concern for this group of teachers was Stage 3 (management concerns), because their highest stage of concern was Stage 2 (personal concerns). The second highest Stage 3 concerns indicated that the respondents were concerned about how the changes necessary to accommodate the implementation of the innovation will be managed in practice, that is, the group as whole also had concerns about issues of time, availability and distribution of resources and other general management issues. It is common for groups to have this adjacent combination of highest score on Stage 2 and second highest score on Stage 3. George et al. (2006) suggested that this arrangement might indicate that respondents had a level of uncertainty and doubt about whether they can master the innovation. The more notable of these management issues were concerns about administrative support of innovation and the availability of resources and time.

Administrative support of innovation

The question of management brought to light concerns about administrative support. All teachers expressed concerns about the level of administrative support that will be required for the successful implementation of the GBL innovation. Teachers recommended that the Principal should facilitate more updated training that focused on the preparation of thematic lessons that cover the primary school curriculum with GBL activities. Also, they proposed that administration allocated sufficient time in the school day for additional activities and provided relevant resources to support the implementation process. Teachers reflected on the positive attitude the former Principal had towards student involvement in garden based activities. However this attitude remained, to a large extent at the level of talk. Once the resources were made available to the teachers, the previous Principal did not provide any relevant training or support facilities that dealt with using the resources to enhance pedagogical practices by the teachers. Teachers also indicated that the present Principal has shown a similar interest and passion for the school garden. Mrs R noted that

> *"When I now started teaching here, the former Principal showed a lot of enthusiasm when it came to Agriculture and the school garden. It was she who got the funding for the agri building and the tools and fertilizers and so on. So she always encouraged us to use it (the agriculture resources) so students can do agricultural science. So when the new Principal came and kind of showed similar enthusiasm towards using the garden with the students, I was glad"*

However, it was evident that the teachers who were interviewed agreed that although the current Principal expressed a willingness to support the innovation through workshops and time table

allocation for GBL activities , they believed that teacher by in must be achieved before any support from the Principal can translate into GBL instruction at the class level. Mr P indicated this concern when he said that

> *"At the school level, the Principal shows a lot of support for this programme but the teachers must come on board."*

The Principal has also indicated to the researcher that the majority of the resources available in the school garden remain severely underutilized. However, she indicated to the researcher that she was willing to set aside time for developmental workshops geared towards the use of GBL as a strategy for curriculum implementation.

Also linked to management concerns was the need for up to date teacher training in GBL so that teachers can implement the innovation with more confidence. Teachers revealed that challenge of implementing the GBL innovation was seen as an opportunity for staff development. One respondent explained that although she received training in the principles of GBL, he still required some updated training. This was made evident when Mrs R stated that

> *"Although I know about the GBL innovation, I have used it with my students but not in any formal way and I don't think that I will do the correct thing if it becomes part of the school's curriculum if I am not given some kind of re-training."*

Lack of sufficient training was seen as a major factor influencing the level of support offered by Mr P who said that

> *"Personally if I'm not trained to do a programme with my pupils, I will not lend all my support."*

Teachers concerns about Garden Based Learning (GBL) as a strategy for teaching and learning

Availability of resources and time

All teachers were concerned about resources needed to support the successful implementation of the GBL innovation. Most notably limited land space available at the school was a major resource issue. Miss C commented,

> *"Even here, although we have all this space in the school garden, sometimes there isn't enough space for everyone to do a crop for the term."*

Teachers were also intensely concerned about the additional time needed during the school day to facilitate implementation of the GBL innovation. What seemed to intensify this concern was the additional teacher workload resulting from the introduction of the Continuous Assessment Component (CAC) of the Secondary Entrance Examination (SEA). As a solution to the time management issue, Integration of both innovations was suggested by a respondent who said that:

> *"With the introduction of the CAC agricultural science component as well, I think it will be difficult to manage both projects at the same time unless there is a way to integrate both."*

Summary of Findings

Finding revealed that the highest stage of concern for the group was stage two. This translated into deep personal concerns about the teachers' role in relation to the reward structures that exist within the organization, decision making and concern about possible conflicts with current structures and personal commitments. A high stage two also indicated teachers held deep personal concerns about the GBL innovation, the consequences it held for them on a personal level and the impact of the innovation on the status structures in the school. The second highest Stage of concern identified was stage 3, a predictable outcome based on the developmental nature of concerns as delineated by George, Hall, and Stiegelbauer, (2006). These secondary management concerns indicated that the teachers were also concerned about how the changes necessary to accommodate the implementation of the innovation will be managed in practice. In essence, the group shared concerns about the issues of time, availability and distribution of resources and other general management issues. Management concerns brought to light issues with administrative support and the level of support from administration that will be required for the successful implementation of the GBL innovation. Also, the need for up to date teacher training in GBL was also a major concern and teachers were also intensely concerned about the additional time needed during the school day to facilitate implementation of the GBL innovation.

CHAPTER FIVE

Conclusion and Recommendations

The SoC questionnaire and the one-legged, semi-structured interviews were a two-pronged approach to assessing the stages of concerns of teachers at Green thumb Primary with respect to the implementation of the GBL innovation. Coming out of the interviews were themes that provided more credence to the SoC Questionnaire data. The questionnaire revealed a profile very similar to the typical non-user; therefore, this study provides a suitable baseline for future evaluations.

A misconception seems to exist in the school context in which Agricultural Science and Garden Based Learning are essentially the same. Establishing a successful GBL programme at Green Thumb Primary can be achieved by first negating the effects of this misconception by providing suitable information and training in order to increase awareness. The first step in the establishment of effective programmes in GBL is the development of an understanding, appreciation and acceptance of the pedagogy. From a concerns perspective, administration must work together with teachers to design strategies to address lower-level concerns such as informational and personal concerns, in order to allow teachers who serve that vital role of implementers of the GBL innovation to focus on higher-level concerns of management, consequence, and collaboration.

For educators, administrators and parents this requires an introduction to the philosophy and history of GBL along with an explanation of how this innovation fits into effective contemporary education. These strategies may treat with the lack of adoption of the GBL innovation in contemporary education as indicated by Desmond et al. (2004) which may lead to greater institutionalization of the pedagogy in mainstream education. Consequently, these strategies may treat with awareness and informational concerns that tend to magnify personal concerns about the innovation (George, Hall, & Stiegelbauer, 2006). According to Hall and Hord (2006), systems and organizations adopt change, but individuals implement change. Attending to the needs of individuals and supporting them at all stages of adoption needs to be paramount.

The implementation of a formal Garden Based Learning programme will place demands on many facets of teachers' pedagogical content knowledge (Shulman, 1986). Consequently, teachers need to pay attention to the understanding and application of curriculum outcomes, how to connect their personal beliefs about student learning to the philosophical underpinnings of GBL, how to observe grouping exercises and scaffold effective group work, how to appropriately assess learning through GBL, and how to structure the learning environment to meet the needs of all students in the outdoor classroom. These strategies mirror those of Smoak and Williamson (1999) whose Down to Earth programme was implemented with a high degree of success. As revealed by their study, educators drew on rich mixture of multidisciplinary topics such as agriculture, natural resources, environmental management, health and human safety, and horticulture. The impact of the Down-to-Earth programme was evident through increased

knowledge of scientific methods, plants, fertilizer and pests, as well as positive attitudinal and behavioural changes, increased awareness and facilitation of higher order thinking processes.

Similar outcomes may be achieved at Green Thumb Primary by first addressing teachers' 'self' concerns through the provision of if appropriate support, guidance and training on an individual level. Through this research it was evident that a school's administration cannot simply manipulate higher level concerns development without identifying and treating with lover level concerns that are more entrenched on a personal level. However, provision of experiences and resources in a timely manner can assist with the identification and resolution of these personal concerns, thereby facilitating the development of higher level concerns later on. It is critical to note that the provision of training or other interventions that are not geared towards the appropriate concerns (e.g., trying to force high level concerns) may certainly lead to an increase the intensity of lower, less desirable stages concerns. The importance of this type of support for successful implementation and use of GBL reinforces the findings of many researchers who concluded that appropriate training, sufficient time, and attention to teacher concerns result in a shift from lower self concerns to higher intense task and impact concerns (Atkins & Vasu, 2000; Casey & Rakes, (2002); Goldsmith, 1997; Hope, 1997; Vaughan, 1997; Wells & Anderson, 1995). Consequently, training must target the individual concerns of teachers before moving on to concerns of how others, even their own students, will embrace and use the GBL innovation. Facilitating and supporting professional development opportunities at Green Thumb Primary can be informed by continued monitoring of teacher concerns. The CBAM model identified the importance of focusing attention to implementation for several years, because, according to Hall and Hord (2006) it takes at least three years for early concerns to be resolved and later ones to emerge. It was evident from this research that teachers need to have their self-concerns addressed

before they are ready to treat with collaboration concerns. Findings were cogent in agreement with the literature which revealed that management concerns may last at least one year, especially when teachers are implementing an academic year's worth of new curricula and also when new approaches to teaching such as the Continuous Assessment Component of the SEA. This requires additional teacher training, resources and practice. Facilitating change over a period of time is necessary to work out teething issues and issues that may arise as well as to reinforce good pedagogical practices once the implementation begins to run smoother. With all the demands placed on primary school teachers, their practice becomes routine in most cases, and they never possess sufficient time and space to focus on what and how students are learning. This evaluation of learning outcomes usually requires some organizational priority setting, as well as inspiring interest and concern about these outcomes relating to specific student learning. This research reinforced the fact that everyone in the educational landscape has concerns. For example, teachers, administrators, parents, students and policy makers. Consequently, recognizing these concerns and addressing them are critical to achieving progress in the implementation of a curriculum innovation.

Several recommendations for practitioners, researchers, and other educators that need to be considered during the adoption of GBL or any other educational innovation are suggested by the research. The more poignant suggestions for the education landscape in this study include firstly, the establishment of collaborative learning communities during the adoption of an innovation and secondly, providing teachers with a supportive context for engaging in information exchange, training and shared meaning-making. These were identified as critical aspects of this study in terms of establishing a learning environment in which individuals' awareness and informational needs could be met during all stages of the adoption process. Secondly, those who

facilitate the adoption of PBL (and other innovations) may use the CBAM framework to inform their choices regarding the types of supports and interventions needed by individuals at each stage of the adoption process. The information garnered from the CBAM framework can be used to facilitate different types and levels of support at various stages of concerns (e.g. resources, encouragement, and critical feedback).

Hall and Hord (2006) opined that the change agent who possesses an informed understanding of the stages of concerns has a much better chance of tailoring guidance and training to meet the needs of the individual, based on his or her specific concerns. Consequently, the ultimate goal of these efforts is to move individuals toward Stages 4 and 5. However, Stage 6 (Refocusing) is typically not desirable because individuals in this stage seek alternatives to the innovation rather than focusing their efforts on high-order usage of the innovation.

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APPENDICES

Appendix A

Letters to the Principal and Participants

The Principal
[redacted]

March 25th 2013

Dear Madam,

In partial fulfilment of the requirements for the completion of the Masters in Education degree at the University of the West Indies, I am conducting a qualitative study on the concerns of teachers regarding the implementation of the Garden Based Learning Innovation. To this end, I am welcoming teachers who possess over two years of training and experience using this innovation to participate in a questionnaire and face-to-face interviews on the issue.

I am, therefore, seeking your permission to conduct this study with three teachers from your school. You have my assurance that the information obtained in this interview will be kept in the strictest confidence and will only be used for the specified purpose. The identity of the school as well as the teachers involved in the study will be kept in the strictest confidence.

It is hoped that this study will contribute to the limited body of knowledge in the Caribbean which speaks to the benefits of using Garden Based Learning in developing nations such as our beloved Trinidad and Tobago.

Thank you for your kindest consideration.

Respectfully yours,

_____

Vishal Ramjattan

Teachers concerns about Garden Based Learning (GBL) as a strategy for teaching and learning

Dear Participant,

In partial fulfilment of the requirements for the completion of the Masters in Education degree at the University of the West Indies, I am conducting a qualitative study on the concerns of teachers regarding the implementation of the Garden Based Learning Innovation. To this end, I am welcoming teachers who possess training and experience using this innovation for more than three years to participate in a questionnaire and face-to-face interviews on the issue.

The interview will be done in two parts. The first will be conducted in the second week of March, and a follow-up interview for validation of the information collected will be carried out in April.

You have my assurance that the information obtained in this interview will be kept in the strictest confidence and will only be used for the specified purpose. No personal data about you is required and as such your anonymity is assured.

It is hoped that this study will contribute to the limited body of knowledge in the Caribbean which speaks to the benefits of using Garden Based Learning in developing nations such as our beloved Trinidad and Tobago. Please be assured that you are free to withdraw your participation in this study at any time if necessary.

Thank you for your willing participation.

Respectfully yours,

_____

Vishal Ramjattan

Appendix B

Stages of Concern Questionnaire

Appendix C

Interview Protocol
General Questions Used to Guide Semi-Structured One-legged Interviews

1. When you think about the GBL innovation being implemented as part of your school's curriculum, what were your feelings and concerns about the initiative?
2. How have you been using the GBL innovation with your pupils?
3. Have the changes in the education system affected your use of GBL in any positive or negative way?
4. What systems do you think can be put in place to facilitate greater support and use of the GBL innovation?
5. Are the positive responses only for the pure agricultural science lessons or the other subjects you teach with the GBL strategy?
6. Do teachers share with you similar stories about their experiences in the garden with their pupils?
7. Is there any collaboration between yourself and your colleagues when it comes to implementing lessons that uses the garden as the classroom?
8. Any other concerns you wish to mention?
9. Do you know of any other school that uses the GBL innovation?
10. What do you envision as the future of this GBL innovation?

Appendix D

Analysis Stage 2 – Emergent Themes by Research Questions compared to relative intensity of concerns derived from SoC questionnaire

Research Question	**Stage of Concern**	**Emergent Theme from one-legged, semi-structured interviews**	**Stages of Concern Group Percentile Scores** **Relative Intensity of Concern from SoC Questionnaire**
At what Stages of concern are teachers at Green Thumb Primary, with respect to the implementation of the GBL innovation as a strategy to support curriculum delivery and promote ecoliteracy?	**Stage 0– Awareness**	**1. Need for more information about innovation.** **2. Need for updated Training** **3. Curriculum integration**	**76**
	Stage 1 – Informational		**84**
	Stage 2 Personal	**4. Teacher effectiveness to enact GBL innovation.** **5. Personal time and resources** **6. Need for updated training** **7. Additional teacher workload** **8. Teacher motivation**	**94**
	Stage 3 Management	**9. Administrative Support of Innovation** **10. Planning for innovation** **11. Availability of resources** **12. Availability of time** **13. Teacher workload** **14. Curriculum integration** **15. Parental Support of innovation**	**88**

	Stage 4 **Consequence**	**16. Impact on students** **17. Impact on school** **18. Impact on Community**	**80**
	Stage 5 **Collaboration**	**19. Teacher buy-in** **20. Resistance to innovation** **21. Teacher collaboration** **22. Communication among staff**	**72**

Appendix E

Summary of Axial Coding by Nodes using QSR NVIVO 10 software

Appendix F

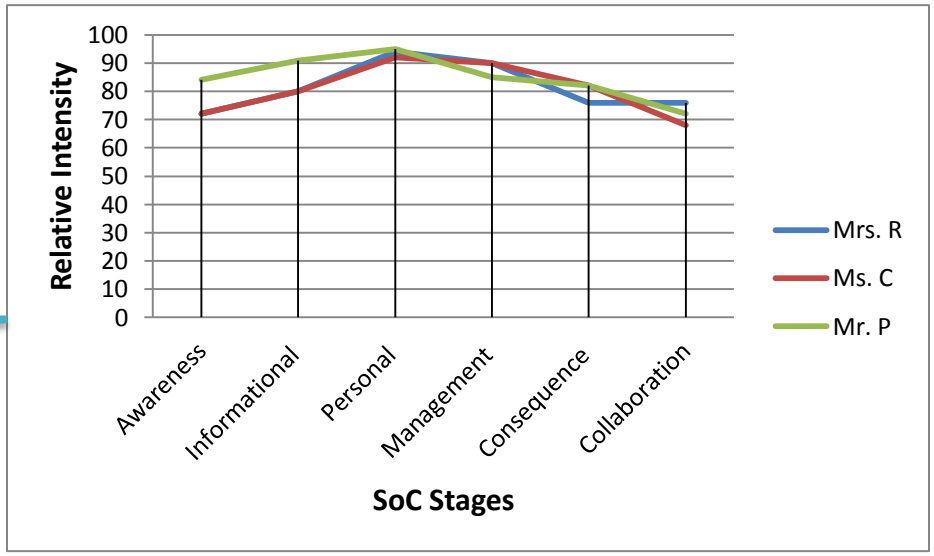
Stages of Concerns Quick Scoring Device for individual Stages of Concern Questionnaire Data

Appendix G

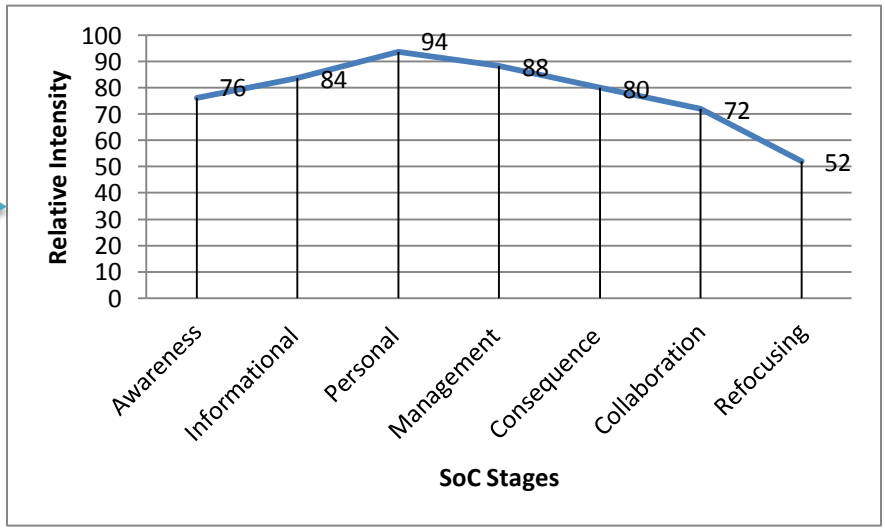
Development of Stages of Concern Group profile for Green Thumb Primary

	Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
	Awareness	Informational	Personal	Management	Consequence	Collaboration	Refocusing
Mrs. R	72	80	94	90	76	76	57
Ms. C	72	80	92	90	82	68	52
Mr. P	84	91	95	85	82	72	47
Average (group)	**76**	**84**	**94**	**88**	**80**	**72**	**52**

Individual



Aggregate



Appendix H

In Vivo Coded Interviews