



Influence of Teachers' Belief on Competence for the Implementation of Environmental Education Curriculum

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Authors' contributions

This work was carried out in collaboration between all authors. Author ACO designed the study, wrote the protocol and supervised the work. Authors RMO, GCD and UNO carried out all laboratories work and performed the statistical analysis. Author AOO managed the analyses of the study. Authors ACO and RMO wrote the first draft of the manuscript. All the Authors contributed to the literature searches and edited the manuscript. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/BJESBS/2016/26259

Editor(s):

(1) Alina Georgeta Mag, Department of Private Law and Educational Science, University of Sibiu, Romania.

Reviewers:

(1) Salvador Peiró i Gregòri, Universidad de Alicante, Spain.

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(3) I. Wayan Sukarjita, University of Nusa Cendana, Indonesia.

Complete Peer review History: <http://sciencedomain.org/review-history/15209>

Original Research Article

Received 7th April 2016
Accepted 22nd June 2016
Published 29th June 2016

ABSTRACT

The purpose of this study was to examine Influence of Teachers' belief on competence for the implementation of environmental education curriculum in secondary schools in Calabar Education Zone of Cross River State, Nigeria. Ex-Post facto research design was adopted for the study. A sample of 417 respondents was randomly selected for the study through stratified and simple random sampling technique. The questionnaire with 0.78 reliability index was the instrument used for data collection. The Independent t- test was the statistical tools used to test the hypothesis formulated for the study at 0.05 significance level. The mean scores of 2.87, 2.84, 2.88, 3.05, 2.91, 2.72, 2.94, and 3.32 were obtained for items 1 to 8 respectively. The result of the analysis showed a

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cal-r to be .581 and the critical -r is .113 with df of 415. This revealed that there is a significant relationship between teachers' belief and their competency in the implementation of Environmental Education curriculum. There is need to consider teachers beliefs as a critical factor in teachers professional development. What a teacher hold as a belief influences classroom practices and by extension, curriculum implementation. On a general note, knowledge of content of subject matter and pedagogical skills are hitherto the key emphasis on teachers competencies. This study showed that these important attributes can be significantly influenced by what the teacher holds as his belief. Teacher Education preparation programmes as well as in- service training programmes should aim at improving teachers belief on the need to promote environmental sustainability while improving on their knowledge based concept of EE and developing their competencies in the cross curricula implementation of Environmental Education curriculum.

Keywords: Environmental education; curriculum; teachers' belief; competence needs.

1. INTRODUCTION AND BACKGROUND TO THE STUDY

Environmental issues have never in the history of human kind, received so much attention than at present. Environmental matters such as pollution, climate change, loss of biodiversity and the extinction of biodiversity, the depletion of the ozone layer, deforestation, desertification, drought, rise in sea level and flooding, population surge as a result of the unsustainable use of environmental resources are some of the issues which have had and continue to have negative effect on the environment. The 21st century is characterized with technological advancement and increased consumption which pose serious constraints on the world's natural resources.

As [1] aptly stated, anthropocentric activities are largely responsible for environmental change and degradation. There is virtually no one single area of the planet no matter how remote that is untouched by human activities. According to [2], the root of Environmental problems lie in human behaviour. To solve environmental problems, human current behaviour pattern towards the environment must be altered. Environmental education has been recognized to bring a change in behaviour.

Environmental education is concerned with teaching conceptual knowledge and skills for monitoring and measuring environmental quality, and also the development of values and attribute which will motivate and empower individuals and groups to work and promote the sustainability of natural and social environments. Thus, the important attributes of environmental education include the creation of environmental awareness, strong concern for the environment and active participation in promoting environmental conservation. The international conferences on

environmental education that took place in 1975 in Belgrade and the intergovernmental environmental education conference held in 1977 in Tbilisi recommended that environmental education should be taught using the multidisciplinary approach. According to the Belgrade Charter environmental education should:

Develop a world population that is aware of, and concerns about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations, and commitment to work toward solutions of current problems and the prevention of new ones [3].

In furtherance of the UNESCO/UNEP 1977 recommendations, the Nigerian Education Research and Development Council [NERDC] developed the Environmental Education curriculum for all the tiers of the Nigeria education system; primary, junior secondary and senior secondary schools including non- formal education [4]. The council has appropriately identified the contents to include four broad areas namely: Ecological foundation, human environment, environmental change and sustainable development. The multidisciplinary approach, the approach in which environmental education is taught in two or more disciplines expressed in terms of interrelationship regarding environmental education issues, has been adopted for the teaching of environmental education. This is usually with modification of the subject matters in the traditional school in-line with the scope, aims, objectives, strategies and guiding principles of environmental education [5].

At the center of any curriculum implementation is the teacher who ultimately is the implementer of the curriculum and the disposition of the teacher

is very essential in the implementation of any curriculum. The Tbilisi intergovernmental conference in Paris in 1977 proposed that the future of the global environment depends on the incorporation of EEC into teacher education programmes by nations [6]. Specifically, UNESCO states it is obvious that even the best cannot have the desired effect if those with responsibility for them have not fully understood the objectives of they are not capable of directing the learning activities and experiments comprising such education or of effectively using the materials available to them.

UNESCO declared that the inclusion of environmental education in teacher education is the priority of priorities. Several researchers expressed the same sentiment that the implementation of Environmental education depends on the extent to which teachers are equipped to teach it [7,8,9].

As [10] asserted, that divergence in the perception of teachers towards various subjects in school is the basis for the formation of their belief system. An individual's belief to a large extent influences his/her behaviour and subsequent action. To a large extent, a teacher's belief towards environmental conservation has potentials to shape his or her value orientation and judgment towards environmental education. Generally, belief is said to dispose or guide people's thinking and action [11]. As the British education theorist Pajares [12] asserts, the teachers beliefs have a greater influence than the teachers knowledge. Teachers' beliefs are central to determine their actual behaviour towards students, the kinds of decision they make and their general classroom practices and the way they plan their lessons. For example [13] noted that teachers who are effective, believe that students can learn, teachers can intervene to meet the needs of diverse learners. Those that have interventionist beliefs have positive classroom practices that leads to improved student achievement. Preparing environmentally literate citizens is very crucial for sustainable living and environmental sustainability. Emphasis on environmental literacy was pervasive in many curricula in developed and developing countries after the UNESCO/UNEP conference in Tbilisi. With the upsurge in climate change and its attendant consequences due to human activities, it is more apt to expand EE in the school curricula.

Studies [14,15,16] found that teachers beliefs influence their classroom practices. As teachers

belief influences their behaviour, so will teachers beliefs also influence student behaviour. As a model, many students do as their teachers. According to [17] beliefs serve as a guide for interpretation of situations, setting of goals and standards and help teachers to make sense of what they experience in the classroom as well as creating and clarifying meanings for teachers. As [18] clearly summarized, teachers beliefs influence teacher consciousness, teaching attitude, teaching methods and teaching policy. However, [19] argued that teachers beliefs and practices are not necessarily aligned as it depends on the context in which teaching takes place.

While there are several researches on teachers beliefs, there are very few ones that relate to teachers beliefs and their various practices in Environmental education. Many of these researchers focused on an aspect of the environment, for example, climate change and not an Environmental education curriculum. Essentially, how teachers belief influenced their competence in environmental education curriculum implementation is an important area that have not been well researched. This research work is therefore focused this important area. Basically, the main thrust of this research is to determine the influence of teachers' beliefs on their competence needs in the implementation of Environmental education curriculum.

It has been observed that since the commencement of the implementation of environmental education in secondary schools in 1998, students of the programme are yet to portray environmental awareness as stated in the objectives of EE. This has become a source of concern to various stakeholders in environmental education including policy makers, curriculum designers, and environmental educators, who have partly attributed these shortcomings in implementation of environmental education curriculum in secondary schools to some defining characteristics within the teacher. These stakeholders seem to closely associate certain components of the teachers' personality and professional competence to the implementation of environmental education curriculum in secondary schools.

2. TEACHERS' BELIEF AND COMPETENCE IN IMPLEMENTATION OF EEC

Belief has been defined as a proposition which may be consciously or unconsciously held, is

evaluative in that it is accepted as true by the individual and subsequently serves as a guide to thought and behaviour [20]. Teachers' beliefs and knowledge and their practices outside the classroom, for example in their lesson planning, will all inform and influence lessons [21]. However, it is the interactions between teachers and pupils as they occur in lessons that will be the most significant influence that a teacher has on pupils' learning. It has been observed that implicit *beliefs* or theories that teachers have, together with their *knowledge*, themselves influence the way that teachers interpret classroom events. For example, if a teacher believes that the major factor in learning mathematics is the rote memorization of routines, then pupil errors are more likely to be interpreted as the result of pupil carelessness or lack of attention. On the other hand, a teacher who believes that pupils are trying to make sense of information may interpret errors as arising from a misunderstanding rather than carelessness.

In an article summarizing research on teacher beliefs and practices, [22] indicated that teacher education research over nearly two decade elucidated the association between classroom practices of teachers and their beliefs regarding students, teaching, and learning. His meta-analysis reveals multiple sources illustrating that a teacher's implicit theory (beliefs) about the nature of knowledge acquisition can also affect his/her behaviours and, ultimately, his/her students' learning. Fang also indicated that teachers' thinking about their roles and the beliefs and values they hold help shape their pedagogy, even though his review does show that contextual restrictions can cause incongruities between belief and practice. If the beliefs of teachers affect learning among students, identifying those beliefs that result in a greater likelihood of creating more and/or better student learning is one step toward ultimately helping teachers improve their teaching. [23] has articulated this linearity in the following phrase: "Teacher beliefs are related to student learning through something that the teacher does in the classroom". [24] statement that teachers' "beliefs about teaching is linked to their instructional decisions" and [25]'s assertion that what teachers do generally reflects what teachers believe are good demonstration of the linearity. [26] also support this concept: "Beliefs are usually influential in judgments about a course of action".

Importantly, [17,15,16] have found that teachers beliefs influence their classroom practices. As

teachers belief influences their behaviour, so will teachers beliefs also influence student behaviour. As a model, many students do as their teachers. When teachers promote a behaviour that they belief in, such behaviour may be transmitted inadvertently to the student. This means that if teachers have a friendly disposition to the environment based on their belief, such behaviour will be imitated by the students. This very common in lower level of the education system. As mentors to the growing mind, teachers are important influence in learners behaviour and belief. The impact of teachers disbelief about environmental problems and the need for its pedagogy in the classroom will not only compromise students ecological knowledge and skills but neglect participation in solving global environmental issues. The need to value the environment and its rich capitals will be diminished from one generation to another.

When we are confronted with new ideas or issues, beliefs serve as a guide for interpretation of situations, setting of goals and standards and help teachers to make sense of what they experience in the classroom as well as creating and clarifying meanings for teachers [27]. As [19] clearly summarized, teachers beliefs influence teacher consciousness, teaching attitude, teaching methods and teaching policy.

Again, teachers' beliefs appear to reflect longstanding attitudes, "common sense," and their experiences in education rather than research-based knowledge about learning and motivation [28]. Essentially, teachers' beliefs play a significant role in shaping their instructional behaviours, and thus what students learn, While there are several researches on teachers beliefs, there are very few ones that death with teachers, beliefs and their various practices in Environmental education. Many of these researchers focused on an aspect of the environment of climate change and not an Environmental education curriculum. Essentially, how teachers belief influenced their competence in environmental education curriculum implementation is an important area that has not been well researched.

2.1 Research Objectives

The main trust of this research is to determine the influence of teachers' beliefs on their competence in the implementation of Environmental education curriculum.

2.2 Research Hypothesis

To guide the study, we hypothesised that there is no significance influence of teachers belief on the implementation of environmental education curriculum.

2.3 Study Area

This study was based in Calabar Education Zone located in cross river state and in the southern part of Nigeria. The study area has a total population of 1,877,554. This zone consists of 197 education wards from seven local government area Akamkpa, Akpabuyo, Bakassi, Biase, Calabar Municipality, Calabar south and Odukpani. It lies within the tropical region of Nigeria and has both dry and wet season essentially a rainforest vegetation with fresh water swamps in the fringes.

The area is made up of two urban towns Calabar and Akamkpa and several communities that are semi- urban and rural in nature. However, only Calabar that is the state capital is developed and have facilities like an international airport, two resorts, a millennium park, two universities and a school of health technology.

3. METHODS

The Ex-Post facto research design was considered appropriate for the study.

The researchers adopted the stratified random sampling technique to select the Local Government Areas used for the study. In each of the local government areas used for the study, the researchers selected 30% of the total number of schools in these areas. The total number of public secondary schools used for the study was 21. To select the sample used for the study, the proportional simple random sampling technique was also used. Only 30% of the teachers in each of the 21 selected secondary schools were used as the sample for the study.

The sample consisted of 417 secondary school teachers selected from 21 public secondary schools in Calabar Education Zone of Cross River State. The sample consisted of 133 male and 284 female teachers.

The instrument used for data collection in the study was a structured questionnaire developed by the researchers with a reliability index of ranged between .66 and .75. The researchers visited all the 21 public secondary schools selected for the study for the administration of the instrument. In each of the selected schools, the researchers obtained permission from the school principal before administering the instrument. All the administered copies of the questionnaire were retrieved from the respondents.

4. RESULTS

We tested the hypothesis that teachers' belief does not significantly relate with their competence in the implementation of environmental education curriculum. The result of this analysis is presented in Tables 1 and 2.

Table 1. Mean and standard Deviation of competence of teachers in EE implementation

Items	N	\bar{x}	SD
1	417	2.889	0.839
2	417	2.837	0.725
3	417	2.878	0.789
4	417	3.305	0.766
5	417	2.914	0.842
6	417	2.719	0.747
7	417	2.942	1.01
8	417	3.321	0.816

The result of the analysis presented in the Table 2 shows that the calculated r-value of .581 is higher than the critical r-value of .113 at .05 level of significance with 415 degree of freedom.

Table 2. Pearson product moment correlation analysis of the relationship between teacher belief and competence in the implementation of Environmental Education curriculum [EEC]

N = 417				
Variables	\bar{x}	SD	Cal-r	Sig
Teacher belief	23.81	2.86	.581*	.000
Competence Implementation	44.11	4.36		

*Significant at .05; df = 415; Critical r-value = .113

This reveals that the null hypothesis is rejected. This implies that there is a significant relationship between teacher belief and implementation of Environmental Education in public secondary schools in Calabar Education Zone of Cross River State.

5. DISCUSSION

The result of the analysis and testing of hypothesis revealed that the null hypothesis which states that there is no significance influence of teachers belief on the implementation of environmental education curriculum was rejected. This result implies that teachers' belief significantly influence the implementation of Environmental Education curriculum in public secondary schools in Calabar Education Zone of Cross River State. The result of this hypothesis testing is in agreement with the findings of many researchers [24,25,26,16,15,17,22]. Basically, beliefs about teaching are linked to their instructional decisions since beliefs are usually influential in judgments about a course of action the teacher will likely take. Competence needs are such judgment that are determine by the teachers belief. What the teacher is required to know in terms of EE and its effective pedagogy constitute the competence needs and the teacher belief is the strong determinant of such needs. Teachers with forward looking belief are more engaging and positively enthusiastic in what the think they required to implement EEC. As [22] indicated that teachers' thinking about their roles and the beliefs and values they hold help shape their pedagogy. Identifying those beliefs that result in a greater likelihood of creating environmentally friendly behaviour and including them in teachers professional development is very crucial and is a necessary step that will ultimately help teachers to improve their teaching.

6. CONCLUSION AND RECOMMENDATIONS

The implementation of environmental education in the school curriculum in the education enterprise is anchored on the teachers. What the teacher belief or does not belief is brought to bear on classroom practices. The making of an effective teacher requires a deep understanding of the objectives of Environmental Education and the expected roles of teachers in the attainment the goals and objectives. Hence, competence in the implementation of Environmental Education

demands commitment through adequate preparation and developing of relevant skills and knowledge that would promote the effectiveness of teaching and learning outcomes in schools especially at the secondary school level. In order to implement any new curriculum or to improve on the existing one, teacher belief must be taken into account. If the teacher has a static belief, no innovation in the curriculum will appeal to him or her. On the contrary, if the teacher has a progressive and forward looking type of belief, the teacher will embrace any renew curricula.

Since teachers are the key to change in the educational system, implementation of EEC not only depend on the teachers' competence in the subject matter and pedagogies relevant to EE, but most importantly their personal disposition towards issue in environmental sustainability. All these influences their function as role model [29,30,31,32]. Teacher education institutions identified as crucial agents in transforming education and society must play the lead role in ensuring that a sustainable future is attainable [29,7,30,33,34]. As [29] recommended, there is need to reorient the curriculum to include a comprehensive environmental perspective and infuse environmental values education, in addition to content knowledge, explicitly stated within curricular goals of teacher-training programmes. The teachers knowledge play a significant role in shaping their beliefs. The adoption of the multidisciplinary approach to implement environmental education requires adequate preparation and basic competency in cross curricula approaches and interdisciplinary teaching. Teachers beliefs are built on what they know about the environment and how we diminish its resources and the backlashes in the form of climate change, pollution, biodiversity loss, etc. Environmental issues must be part of teacher education curriculum. The extent of environmental awareness of teachers will influence their action and their environmental practices. If they see the environment as the only hospitable planet to life that needs be protected, they will promote positive beliefs on the need to save the resources.

Education through its relevant agencies should encourage teachers to participate in in-service training programmes that would help improve their competence in the implementation of Environmental Education curriculum. Such professional programme should promote new innovation in the school curriculum that promote sustainable living. This will in turn enhance

teachers beliefs and practices in promoting environmental issues.

Teachers should be regularly and adequately sensitized on the need to develop process type belief about new development in education as a veritable tool for sustained human resource development and progress through regular workshops and seminars on multidisciplinary approaches to contemporary issues in sustainable development. As UNESCO aptly recommended, the inclusion of EE in teacher education should be the priority of priorities.

Further research on what methodologies are available to teacher educators for changing their beliefs, what factors come into play concerning changing the beliefs and what beliefs should we teach and the problems posed for changing beliefs are suggested.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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QUESTIONNAIRE

Teachers' Variables and Competence in Implementation of Environmental Education Curriculum Questionnaire (TVCIEECQ)

Dear Respondent,

The researchers are conducting a study on Teachers' belief and competence in the implementation of environmental education curriculum in secondary schools in Calabar Education Zone of Cross River State.

Please kindly tick (√) the option that best represent your view on each item in the questionnaire.

- SA** = Strongly Agree
- A** = Agree
- D** = Disagree
- SD** = Strongly Disagree

Teachers' Beliefs and Competence in Implementation of Environmental Education Curriculum Questionnaire (TVCIEECQ)

Dear Respondent,

The researchers are conducting a study on Teachers' belief and competence in the implementation of environmental education curriculum in secondary schools in Calabar Education Zone of Cross River State.

Please kindly tick (√) the option that best represent your view on each item in the questionnaire.

- SA** = Strongly Agree
- A** = Agree
- D** = Disagree
- SD** = Strongly Disagree

SN	Items	SA	A	A	SD
1	Education can be used to change people's level of understanding in the society				
2	I belief that effective teaching can promote students' efficiency in the classroom				
3	Teacher can add value to an individual's life for functional living				
4	Education can add value to an individual's life for functional living				
5	Education can create environmental awareness in the society				
6	Negative attitude can be changed through acquisition of relevant knowledge in school				
7	Effective teaching can bring out the best in a learner				
8	Inculcating the right values in a learner can be achieved by a good teacher				
9	Environmental issues can be taught in all subjects				
10	Environmental issues are easy to teach				
11	I possess adequate knowledge of environmental issues				
12	I have the skills to teach environmental issues				
13	I participate in environmental discourse				
14	Skills for teaching sustainability is easy				
15	I promote environmentally friendly behaviour among my students				

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Peer-review history:
 The peer review history for this paper can be accessed here:
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