

SELF-EFFICACY AND SECONDARY SCHOOL TEACHERS' KNOWLEDGE OF ENVIRONMENTAL EDUCATION IN CROSS RIVER STATE, NIGERIA

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Abstract

This study ascertained the influence of teachers' self-efficacy on their knowledge of Environmental Education in secondary schools in Calabar Education Zone of Cross River State. A survey design was adopted for the study. Study's population was made up of all secondary school teachers in the study area. Sample was drawn through purposive sampling procedures with a sample of 769 respondents drawn for the study. A 32-item questionnaire tagged "Teachers' Variables and Knowledge of Environmental Education Questionnaire" (TVKEEQ) was utilized to collect data. Cronbach Alpha was used to estimate the reliability of the instrument. Data analysis was achieved using One-Way Analysis of Variance (ANOVA) and tested at .05 level of significance. The finding revealed that self-efficacy had a significant influence on teachers' knowledge of Environmental Education. Recommendations included that; workshops and conferences should be organized for secondary school teachers on the need for them to appreciate having appreciable knowledge of environmental education.

Key words: environmental education, secondary school teachers, self-efficacy

Introduction

There has been a tremendous shift in moves made towards protecting the environment in recent times to ensure sustainable environmental, social and economic development. This is due to the glaring fact of the fast rate at which Planet Earth is losing its physical, biological and chemical capabilities, a phenomenon generally known as environmental degradation. Man's desire to protect the earth and ensure its continuous existence vis-à-vis his continuous survival led to the conceptualization of an instrument which would enable such. The instrument, known as Environmental Education, was first brought to global notice in 1975 in Belgrade (in present day Serbia, Europe) during an international conference on Environmental Education.

Based on the pressing need to fast track the earth's protection, this conference was followed by another one organized by United Nations Educational, Scientific, Cultural Organisation and United Nations Educational Programme in 1977 in Tbilisi (in present day Georgia, Europe) where the goals, objectives and guiding principles of the discipline were designed for onward immediate implementation across schools at all levels and in all countries around the globe. The reason why the global society adopted the strategy of education in ameliorating the challenges faced by the earth is because it is a proven tool which can bring about desired behavioural changes in human beings.

In Nigeria, the desire to join the trend led to a series of events. It started with the founding of the National Conservation Foundation (NCF) in 1982. Next was the Baguada Conference of 1985 from which a platform was provided for the Nigeria Environmental Education Curriculum to spring up. Afterwards, the Nigeria Conservation Strategy was launched in 1986. The next event was the National Conservation Education Strategy (NCES) conference which took place at the Yankari Game Reserve in 1988, and lastly, an adoption of the NCES in 1990 as part of the National Policy on Education by the National Council on Education (Emmanuel & Ambe, 2014). Worthy of note is that between 1986 and 1988, NCF promoted conservation education in then Borno, Lagos, Bendel and Cross River States.

Without teachers' having adequate knowledge about environmental education concepts, much will certainly be left to be desired in achieving sustainable development (Agbor, 2016). This is because rather than have a citizenry equipped with knowledge, attitude and skills concerning exhibiting pro-environmental behaviours, there will rather be a citizenry who will be grossly ignorant towards environmental sustainability and sustainable development. In addition, without teachers' adequate knowledge of environmental education concepts, it will be a situation where most of the citizenry will be well equipped with environmental information and not environmental education. Being equipped with environmental information has a lower capability of enhancing an individual's problem-solving and decision-making skills while environmental education has a higher propensity of ensuring such (Agbor, 2016).

Many factors are connected with teachers' ability to deliver a curriculum. Studies have shown that their self-efficacy is among the factors which influence their ability to successfully deliver a curriculum to learners. It is a concept which is concerned with an individual either having extra psychological resources which enable him or her to have the ability or develop the capacity to be optimistic about any challenge to be faced, "bounce back" after seeming setbacks, and be very positive even in the face of negative circumstances (Shen, Yang, Wang, Liu, Wang & Wang, 2014). Generally, this variable encompasses an individual's capability to exhibit positive intrinsic motivational tendencies towards the successful completion of personal or organizational goals and objectives in a workplace environment.

It is an area of study which was conceptualized to counteract research into negative psychological outcomes of workplace environment such as burnout, exhaustion, stress, resistance to change, alienation, etc. Thus, to some researchers, it is conceptualized as positive psychological capital and its elements are seen as psychological qualities (Yalçın and İsgör, 2017). It is an area which has been mainly researched upon against teachers' stress levels in their workplace environment and not against their knowledge level of subject matter.

Based on the above stated evidences from researchers, teachers' knowledge of subject matter in a given area could be influenced by their self-efficacy. In line with the above premise, this study ascertained the influence of teachers' self-efficacy on their knowledge of environmental education in Calabar Education Zone of Cross River State.

Self-efficacy is a conceptualized dimension of learning which has attracted research attention because its features depict a set of characteristics which can be changed and developed by training, education or experience for enhanced development and direction of performance on either a personal or organizational level (Yalçın and İsgör, 2017). Its features are confidence, hope, optimism and resiliency (Hmieleski & Carr, 2007).

In an investigation carried out by Richardson (2011), it was found out that efficacious teachers usually go extra lengths to encourage and motivate their students to attain very high achievement levels in their academics. It was also revealed that efficacious teachers do not give room for ethnic/racial stereotypes, personal biases and other issues which would deter or demotivate a student when educating him/her. Lastly, the finding revealed efficacious teachers to be relentless, resolute and determined in their efforts to ensure students complete their homework on time, and participate fully in whatever academic exercise being undertaken in class. In a related study, Eberle (2011) revealed teachers' self-efficacy levels having a statistically significant and positive correlation with their math test scores. Thus, teachers with perceived higher self-efficacy levels could positively influence students' academic performance more than those with perceived lower self-efficacy levels.

Mojavezi and Tamiz (2012) reported teacher self-efficacy as being significantly and positively correlated to students' motivation. The finding was such that teachers with high levels of self-efficacy had the highest influence on student achievement, followed by those with moderate levels of self-efficacy, before those with low levels of self-efficacy. In a study, Alvarez-Nunez (2012) discovered a significant difference between students' scores based on those taught by teachers with perceived high efficacy levels and those with perceived low efficacy levels. Similar to findings of Richardson (2011) and Eberle (2011), they seemingly strengthen the assertion that teachers who perceive themselves as having high levels of efficacy are more capable of impacting more on student achievement as against teachers who perceive themselves as being low on self-efficacy levels.

Kurt, Güngör and Ekici (2014) assessed the correlations amongst teachers' self-efficacy, self-efficacy of teaching process and perception of responsibility for achievement of students and revealed positive correlations amongst the various investigated variables. Gowrie and Ramdass (2014) evaluated dimensions of teacher self-efficacy (student engagement, instructional strategies and classroom management) and students' achievement in schools. The finding revealed all the three aforementioned indicators serving as significant predictors. This finding is similar to that of Kurt *et al.* (2014) based on its assessment of the effect of teacher efficacies on aspects of the teaching-learning process which ultimately influences student achievement.

Alrefaei (2015) assessed teachers' self-efficacy senses as a correlate of high school students' achievement in mathematics and sciences and revealed teachers' efficacy levels having an insignificant correlation with achievement of students in the investigated subjects. Perhaps, the finding could be presumed to be limited by any or all of the following - dimension of teacher efficacy investigated, number of achievement tests used or even number of students whose results were used to investigate their teachers. Dybowski, Sehner and Harendza (2017) explored magnitude of relationship between teacher efficacy and teacher quality and revealed teacher efficacy serving as an insignificant correlate of teacher quality. This finding also seems to negate the findings of other studies which revealed teacher efficacy as a significant correlate of students' achievement. Presumably, the finding might have been so as a result of not using student results for investigating the effect of teacher efficacy on it.

Shahzad and Naureen (2017) examined teacher self-efficacy on achievement of students and discovered a significant and positive correlation between teacher self-efficacy and achievement of secondary school students. Ostensibly, this finding only serves to affirm teacher efficacy as a veritable indicator of student achievement. Sarac and Aslan-Tutak (2017) ascertained the correlates between teacher efficacy and students'

self-efficacy and achievement in trigonometry. Result revealed an insignificant relationship between teacher efficacy and achievement of students in trigonometry.

Statement of the problem

The multidisciplinary approach of environmental education in secondary schools implies that teachers use their various subject areas as a vehicle for discourse of environmental themes and content in class. This implies that usage of the various subject areas to discourse environmental education themes and content requires them having appreciable knowledge of environmental education. Yet, issues have continued to plague their knowledge levels of the discipline based on observations by researchers. First of all, most of them have been observed to have vague knowledge of the discipline's concepts. This has been inferred to depict the teachers' lack of substantial skills concerning the discipline's instructional delivery. Most of them have also been observed to have unsubstantial know-how levels concerning the subject. This has been hypothesized to suggest their unappreciable competence levels on how to implement environmental education's multidisciplinary approach.

Lastly, most of them have been observed to have a seeming lack of belief in line with how to teach the subject's concepts alongside their already designated subject areas. This can be presumed to imply their inadequacy of behavioural beliefs towards the subject, i.e., the development of an uncomfortable attitude toward the subject. The result of the scenario is that environmental education concepts are not effectively taught to students in schools. This sad situation is the issue facing the multitude of "supposed-to-be environmental literate" secondary school learners within the study area in this era of environmental sustainability and sustainable development. In addition, many other issues that are worrisome about the state of implementing environmental education curriculum in secondary schools remain unanswered. It is against this backdrop that this study inquired the influence of teachers' self-efficacy on their knowledge of environmental education in secondary schools in Calabar Education Zone of Cross River State.

Hypothesis

The following hypothesis was formulated for the study.

1. Teachers' self-efficacy has no significant influence on their knowledge of environmental education

Methodology

A survey design was utilized for the study. The study was conducted in Calabar Education Zone of Cross River State. All secondary school teachers in the area (2,213) served as the population. Purposive sampling technique was employed to select 769 respondents for the study. A questionnaire tagged "Teachers' Self-Efficacy and Knowledge of Environmental Education Questionnaire" (TSEKEEQ) was used for collecting data. The reliability estimate method used was Cronbach Alpha and the result revealed the consistency to be .82. After collecting copies of the questionnaire, a return rate of 91.94% (707 questionnaires) was attained. One-way ANOVA was used for data analysis. The assessed themes of teachers' knowledge of environmental education were sustainable development, human environment/development, environmental change/impact and ecological foundations, history, principles, methods and objectives.

Results

As presented in Table 1, the mean score obtained by the 707 subjects as regards to their self-efficacy was 21.56 with a standard deviation of 4.58 with the 313 males having a mean score of 22.37 with a standard deviation of 4.80 while the mean score obtained by the 394 females was 20.91 with standard deviation of 4.29. The result further revealed that the mean score of 43.41 with a standard deviation of 12.00 was obtained by the subjects as regards their knowledge of environmental education with the males having a mean score of 45.11 with a standard deviation of 12.18 while the mean score of 42.05 with a standard deviation of 11.70 was obtained by the females. The mean score of 43.41 as shown in Table 1 is lower than the reference mean of 60.00 for the 24 items that measured teachers' knowledge of environmental education thus implying that their knowledge of environmental education is low.

Table 1: Mean scores and standard deviations of subjects in the study variables across gender (N=707)

| Variables | Gender | N | Mean | SD |
|--------------------------------------|--------|-----|-------|-------|
| Self-efficacy | Male | 313 | 22.37 | 4.80 |
| | Female | 394 | 20.91 | 4.29 |
| | Total | 707 | 21.56 | 4.58 |
| Knowledge of environmental education | Male | 313 | 45.11 | 12.18 |
| | Female | 394 | 42.05 | 11.70 |
| | Total | 707 | 43.41 | 12.00 |

HO: Teachers' self-efficacy has no significant influence on their knowledge of environmental education

The hypothesis was analysed using one-way ANOVA and tested at .05 levels of significance. The result of the analysis is presented in Table 2.

Table 2: One-way ANOVA of teachers' self-efficacy and their knowledge of environmental education

| Teachers' self-efficacy | N | Mean | SD |
|-------------------------|-----|-------|-------|
| Low | 171 | 39.78 | 10.97 |
| Moderate | 398 | 42.78 | 10.94 |
| High | 138 | 49.71 | 13.75 |
| Total | 707 | 43.41 | 12.00 |

| Source of variance | Sum of Squares | df | Mean Square | F | Sig. |
|--------------------|----------------|-----|-------------|---------|------|
| Between Groups | 7872.139 | 2 | 3936.070 | 29.525* | .000 |
| Within Groups | 93852.356 | 704 | 1333.313 | | |
| Total | 101724.495 | 706 | | | |

* Significant at .05 alpha level; $p < .05$.

The result in Table 2 revealed that the mean score obtained by the 171 subjects who had low self-efficacy levels was 39.78 which is less than the mean score of 42.78 obtained by the 398 subjects who had moderate self-efficacy levels and this is also less than the mean score of 49.70 obtained by the 138 subjects who had high self-efficacy levels. This implies that the more the teachers' self-efficacy levels, the more their knowledge of

environmental education. The result further revealed that the calculated F-ratio obtained was 29.525 with a p-value of .000 at .05 level of significance with 2 and 704 degrees of freedom. With the obtained result, the F-ratio was statistically significant and the hypothesis which stated that teachers’ self-efficacy has no significant influence on their knowledge of environmental education was rejected.

Since teachers’ knowledge of environmental education was significantly influenced by their self-efficacy, the source of the difference was determined using a Post Hoc Test analysis. The result is presented in Table 3. An examination of the result in Table 3 show that, the subjects who had low self-efficacy levels had a significant lower mean score in absolute sense on knowledge of environmental education, when compared with those who had moderate self-efficacy levels and those who had high self-efficacy levels respectively (MD=-3.00; $p>.05$), and (MD=-9.92; $p>.05$). Other pair wise comparison show that the subjects who had moderate self-efficacy levels had a significant lower mean score in absolute sense on knowledge of environmental education, when compared with those who had high self-efficacy levels (MD=-6.92; $p<.05$). Based on these, it was concluded that, the source of the difference was basically from all the various levels of self-efficacy.

Table 3: Fisher’s Least Significance Difference (LSD) multi-comparison test analysis of the influence of self-efficacy on knowledge of environmental education among teachers

| (I) Self-efficacy | (J) Self-efficacy | Mean Difference (I-J) | p-level |
|-------------------|-------------------|-----------------------|---------|
| Low | Moderate | -2.99527* | .005 |
| | High | -9.91927* | .000 |
| Moderate | Low | 2.99527* | .005 |
| | High | -6.92400* | .000 |
| High | Low | 9.91927* | .000 |
| | Moderate | 6.92400* | .000 |

*The mean difference is significant at the .05 level.

Discussion

The study’s finding revealed a significant influence of teachers’ self-efficacy on their knowledge of environmental education in secondary schools with the result implying that the lower the self-efficacy level, the lower the knowledge of environmental education and vice versa. In order to verify the source of the difference between the various self-efficacy levels, a Post Hoc Test was conducted and it was revealed that the source of the difference was from all the various levels. This meaning that comparison of the means of the various self-efficacy levels was significantly different from each other.

Based on the finding, teachers with higher levels of cognitive processing stability under seeming pressure, higher levels of concentration and focus towards goal-attainment despite distractions, and higher levels of being optimally motivated in the quest for success despite challenges are said to be more knowledgeable in environmental education than those who are in short supply of the aforementioned self-efficacy resources. Perhaps, this could be attributed to the mediating factor of the professional workload of those in short supply of the investigated self-efficacy resources. This presumption is based on the

fact that the concept of self-efficacy was brought about to counteract scholarly investigations into negative psychological outcomes of a workplace environment.

The study's finding agrees with that of Richardson (2011) who revealed that self-efficacy was not only a statistically significant indicator of teachers' impact on students' academic performance but also found out that efficacious teachers mostly go extra lengths to encourage and inspire their students to attain very high performance levels in their academics. Eberle (2011) revealed teachers' self-efficacy levels as having a statistically significant and positive correlation with students' academic achievement in secondary schools with students of high self-efficacy teachers outscoring their counterparts from teachers of low self-efficacy. Alvarez-Nunez (2012) reported significant difference between students' academic performance in terms of those taught by teachers with perceived high efficacy levels and those taught by teachers with perceived low efficacy levels. In their study, Achurra and Villardón (2012) investigated teachers' self-efficacy and student learning and revealed students of teachers with perceived higher self-efficacy levels performing better than students of teachers with perceived lower self-efficacy levels.

Still on studies which are in support of this study's finding, Pan (2014) examined teachers' self-efficacy and secondary school students' motivation and revealed self-efficacy having statistically significant correlation with students' learning motivation. Gowrie and Ramdass (2014) also reported teacher self-efficacy serving as a statistically significant predictor of the following dimensions of students learning outcomes - student engagement, classroom management and instructional strategies. Shahzad and Naureen (2017) examined teacher self-efficacy on achievement of students and revealed a statistically significant and positive correlation between teacher self-efficacy and students' achievement.

The finding was not in agreement with that of Alrefaei (2015) who found out that teachers' efficacy levels had insignificant correlations with students' achievement in specified subjects. The finding also contradicted that of Dybowski *et al.* (2017) who explored self-efficacy and clinical educators' teaching quality and reported self-efficacy as an insignificant correlate of teacher quality. The finding also disagreed with that of Sarac and Aslan-Tutak (2017) who reported an insignificant relationship between self-efficacy of teachers and achievement of students in trigonometry.

Conclusion

In this era of environmental sustainability, knowledge of how to cater for the environment is an imperative for all and sundry. It is an imperative because from time immemorial, man has treated the environment as a liability which can be used and abused without care thus leading to some glaring environmental consequences in recent times. If not for any other glaring environmental consequence in recent times, the phenomenon of climate change due to global warming with its attendant academic, ecological, socio-cultural, economic and political implications is enough to give evidence that man might have to brace up for more reactions from the environment if we do not learn to appreciate that people need to be educated on how to develop a stewardship-like mentality towards the environment.

Appreciation of the need to have grounded knowledge of the concepts amongst teachers in secondary schools is even of more necessity without which there will be almost no hope of salvaging our environment as learners who go through schooling without environmental-based learning experiences could end up having little or no pro-environmental attitudes. In addition, in this era of increased school enrolment, if

advantage is not taken to ensure the implementation of environmental education learning experiences, it could serve to be a spanner in the works when the environment will bring about more reactions.

Recommendations

The following recommendations were made

1. Workshops and conferences should be organized for secondary school teachers on the need for them to appreciate having appreciable knowledge of environmental education for enhanced contribution towards sustainable development
2. Secondary school teachers should also be encouraged to develop the need to infuse environmental education based themes and content into their instructional delivery plans
3. Teachers of environmental education from tertiary institutions should see the need to organize conferences and workshops with the aim of pressing home the need for environmental education to be made part of the learning experiences for learners in secondary schools

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