

Primary and Secondary School Teachers' Conception of Environmental Education in the English and French Speaking Subsystems of Education in Cameroon

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Abstract

Cameroon is considered Africa in miniature because of its diversified ecological zones, linguistic and sociocultural background with two subsystems of education inherited from France and Great Britain. We intend to evaluate the efficiency of government's policy for environmental education for sustainable development in this diversified context. Teachers' conception of environmental education (EE) was investigated using questionnaire created and validated by the Biohead-Citizen research project. The Principal component analysis (PCA) global results revealed three poles: ecocentric, anthropocentric and sentimentocentric, with some correlation between preservation (A28, A22) and anti-GMO opinions (A13, A47), and between utilization (A23, A32) and pro-GMO opinions (A12, A39). Between-class analyses showed that these conceptions were determined by language and groups of teachers rather than by age, religion, gender or level of education. In-service and pre-service primary schools teachers differed from their secondary school colleagues in being more anthropocentric and less ecocentric. English-speaking teachers' conceptions are more anthropocentric and less ecocentric than their French-speaking counterparts. English-speaking teachers also think the main goal of environmental education (EE) is more of knowledge provision than developing responsible behaviour. An orthogonal Principal component analysis based on instrumental variables (PCAIV) showed persistence of the differences observed at $p = 0.001$, thus effect of language and group of teachers are mutually exclusive. These results show that the different educational subsystems within Cameroon have resulted in different attitudes related to environmental education. This highlights the need for harmonising the two systems for common citizenship values. In perspective it would be interesting to compare these results with those of France and Britain to establish the impact of colonialism on such conceptions, as well as to develop didactic strategies to overcome identified obstacles towards conceptual change.

Keywords: Environmental Education; Teachers' conceptions; Cameroon; Anthropocentric attitudes; Ecocentric attitudes; Multivariate Analyses.

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Introduction and research question

Cameroon is located in the Central African, sub-region between latitudes 2° and 12° North and longitudes 3° and 16° East. This accounts for her diversified climatic and ecological zones, with a very humid equatorial south to a dry and almost desert north. Such contrast has made most researchers to refer to it as “Africa-in-miniature” because almost every climatic and ecological zone found in Africa is represented in Cameroon. Additionally, Cameroon has a diversity of ethnic and linguistic background, with English and French as official languages and two educational subsystems inherited from her colonial masters (Britain and France). The two subsystems are different in structure, content and certification (Fokeng, 2012).

Just like any other country, her environment is experiencing changes due to human related activities with consequent problems including biodiversity loss, land degradation, deforestation, etc, all requiring appropriate interventions. In line with UNESCO policy on Education for Sustainable Development (ESD) (UNESCO, 2009a, 2009b), the Cameroon government through the Ministries of Environment and Nature Protection, Forestry and Wildlife, Basic and Secondary Educations has introduced EE in her education policy (1998) to enhance critical thinking, problem-solving, and effective decision-making skills, for informed and responsible decisions towards natural resources conservation.

Several researchers have analysed teachers' conceptions of environment in several countries (Munoz et al, 2009; Clément & Caravita, 2012) and demonstrated significance differences among countries. These conceptions are generally characterised by two poles: anthropocentrism and ecocentrism. Anthropocentrism is “human-centred”. Ecocentrism is ‘ecosphere-centred’, emphasising the intrinsic value of the interrelated ecological systems of which humans are a part, (Callicott, 1984; Larrère, 1987; Plumwood, 1996). These two poles are respectively called “Utilization” and “Preservation” in the 2-MEV model (Wiseman & Bogner, 2003; Bogner & Wiseman, 2004; Munoz et al, 2009; Milfont & Duckitt, 2010).

To these are added a third pole - “anthropomorphism” (Quinn, Castéra & Clément, 2015), initially referred to as “sentimento-centred” attitude (Khalil et al, 2007), - belief that animals can feel and think like Humans.

Hence this study sets out to attempt to answer the questions: Are there significant differences between the conceptions of teachers of the English and French-speaking subsystems of education in Cameroon? Which other parameters influence teachers' conceptions of EE in Cameroon?

Methodology

This study is a non-interventional descriptive and analytical cross sectional study. Research instrument used to collect data is a questionnaire designed and validated by the Biohead-Citizen project (Carvalho, Clément, Bogner & Caravita, 2008). Twenty three variables related to EE were selected:

Two parallel independent translations of the questionnaire were made into French from the original English, and compared with another by a third person. A back-translation by an independent person from the translated French version was compared to the original English version to ensure homogeneity. A purposive sampling was used to sample 523 teachers representing in-service (In) and pre-serve (Pre) Primary (P), Biology (B), and Language (L) teachers from both the French- and English-speaking subsystems of education, as in Table 1.

Table 1: Distribution of respondents according to groups and subsystem in Cameroon

	1= English-speaking	2= French-speaking	TOTAL
InB	41	52	93
InL	36	35	71
InP	34	22	56
PreB	46	47	93
PreL	37	37	74
PreP	69	67	136
TOTAL	263	260	523

Different groups filled out the questionnaire anonymously in the presence of a researcher, who immediately collected them to ensure high returns.

The questionnaire were coded in an excel file and a multivariate analysis for differences in conception was performed using the statistical software “R”(Munoz et al, 2009) We further performed a between-group analysis (age, language, gender, religions and groups of teachers) to complement the initial PCA which differentiates everybody. Each between-group analysis was completed by a Monte Carlo randomisation test to determine whether the differences observed were significant or not. An orthogonal PCAIV was used to suppress the interaction effect when two variables were suspected to interact.

Results and discussion

Three major groups of teachers were distinguished from the PCA result. In Figure 1 the vertical axis differentiates the ecocentric or preservation poles, from the upper anthropocentric or utilization pole of the environment, and perpendicular to these two poles is a third pole which is related to the "feelings" of animals, being

sentimentocentric (A45, A29, A10). This group of teachers think that snails, flies and frogs are or are not able to feel happy.

Figure 1 reveals some correlation between:

- preservation (A28, A22) and anti-GMO opinions (A13, A47), and
- utilization (A23, A32) and pro-GMO opinions (A12, A39).

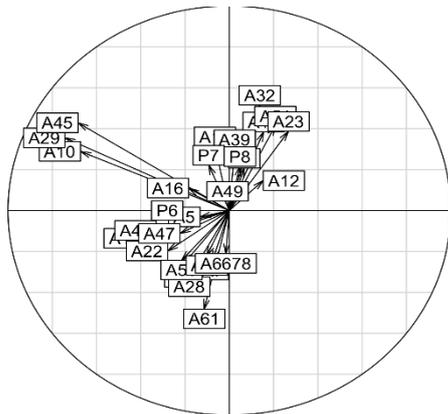


Figure 1: Correlation Circle, plan 1-2 – PCA EE
76% of respondents think the main goal of EE (A61) is to promote responsible behaviour rather than provide knowledge.

More than 85% perceived the notion of environment as beautiful (A69), pleasant (A72), good (A76) and pure (A74) with 70% of the opinion that the environment should be preserved (A70).

PCAIV and between-class analysis showed statistically significant differences in teachers' conceptions of EE for two parameters - group of teachers (Figure. 3) and language (Figure. 4). No significant statistical differences were noticed for gender, religion, age, and qualification.

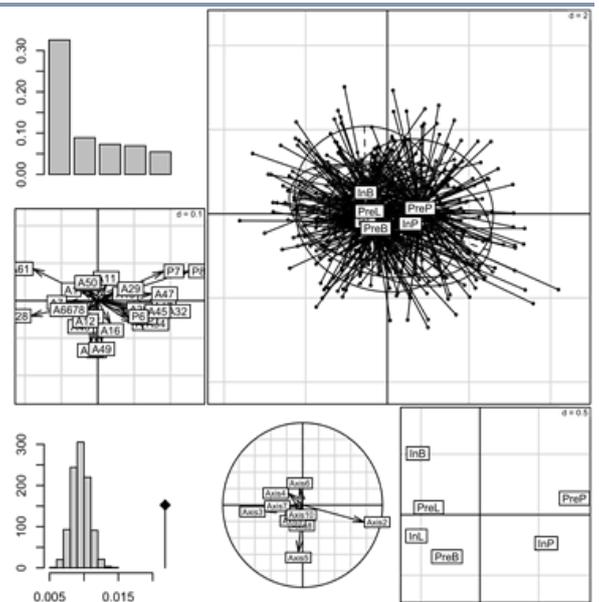


Figure 2: Between-class analysis on groups of teachers after PCAIV on language.

Results show a statistically significant effect ($p < 0.001$).

Figure 2 reveals that the InP and PreP are less ecocentric (e.g. disagreeing more with A28 “It makes me sad to see the countryside taken over by building sites”), and more anthropocentric (e.g. agreeing more with A32: “Humans have the right to change nature as they see fit”); and less “professionally involved in activities pertaining to environmental conservation and/or sustainable development” (P8) than their colleagues of secondary school. This indicates an obstacle to overcome to effectively implement EE in primary schools. The Primary school teachers also think that the main goal of EE should be knowledge provision rather than conservation and sustainable exploitation of resources (A61) as well as having less scientific knowledge on GMO (A49).

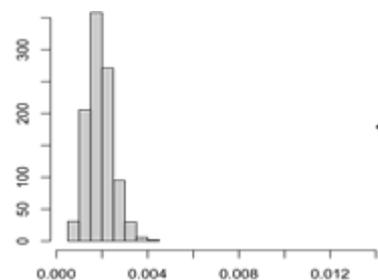


Figure 3: Between-class analysis on language after PCAIV on groups of teachers.

Results show a statistically significant effect ($p < 0.001$).

The stacked bar charts (Figure 4) further reveals that English-speaking teachers are less ecocentric (A32), more utilitarian (A4), and agree less with the

goal of EE (P8) than their French-speaking counterparts.

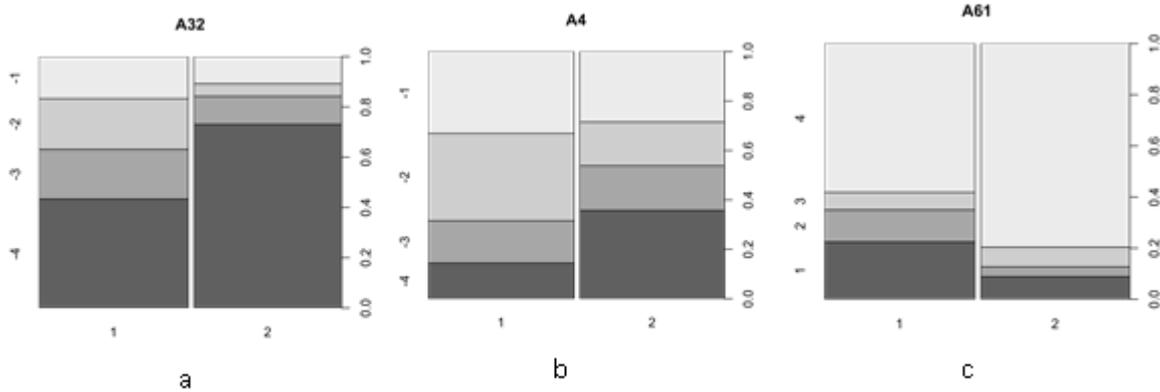


Figure 4. Comparison of English-speaking and French-speaking teachers' conceptions of environment in Cameroon.

(1=English-speaking, 2=French-speaking responses to propositions A32 A4 and A61 from "I agree": pale gray; to "I don't agree": black).

Only 62% of English-speaking respondents disagree with A32 compared to 85% of their French-speaking counterparts who are more ecocentric. 70% of English-speaking teachers compared to 45% of French-speaking teachers agree with A4 indicating their anthropocentric views. This is further buttressed by the fact that 65% of English-speaking teachers compared to 85% of their French-speaking counterparts support the opinion expressed in P8 and A61 about the goal of EE.

Figure 4 therefore shows clearly that English-speaking teachers are significantly more

anthropocentric and less ecocentric than their French-speaking colleagues. They also consider more than their French-speaking counterparts that the main goal of EE is to provide knowledge. Nevertheless, to test if these differences are not a single consequence of the effect differentiating the six groups (Table 1), a PCAIV between the six samples and the subsequent between-class analysis showed a clear persistence of the differences observed between English-speaking and French-speaking teachers' conceptions.

Furthermore a between-class analysis for religion, gender, qualification and age showed no significant difference - Figure 5 (a, b, c, d).

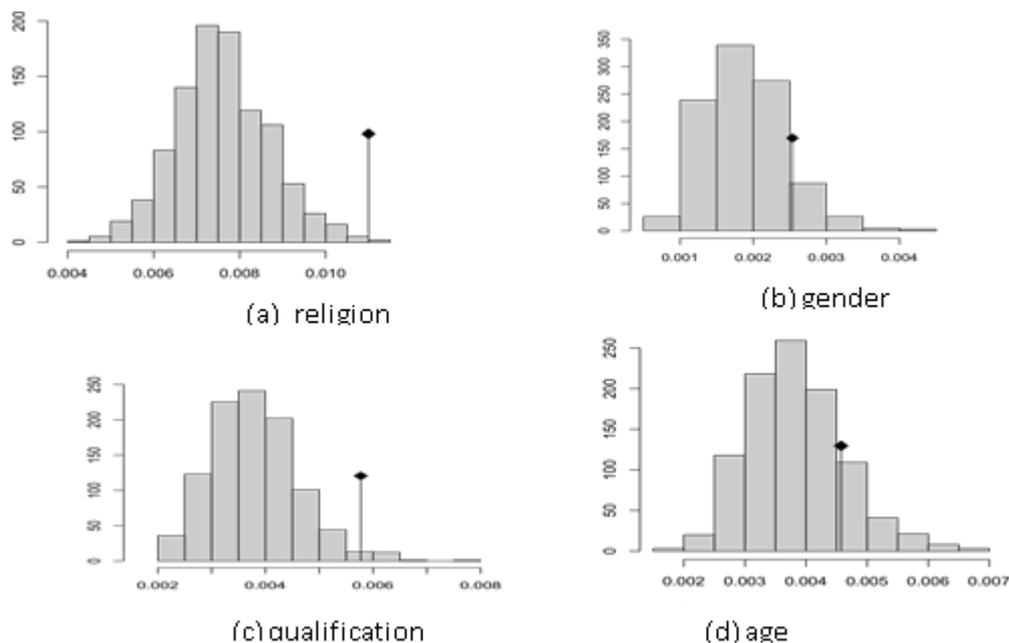


Figure 5: Between-class Monte-Carlo test showing no significance

Conclusion and perspectives

These results clearly show that in Cameroon, teachers' conceptions of the environment and EE are not the same among English-speaking and French-speaking teachers, suggesting a clear influence of the British or French systems of education on these teachers.

In perspectives it would be interesting to find out if a similar difference occurs between the French and British teachers. The results presented by Clément and Caravita (2012) related to 24 countries (including France and Great Britain) are too global to immediately answer this question.

In conclusion, our results show that different educational systems of teacher training, even within the same country, can result in different attitudes related to environment and environmental education. The differences between these two educational systems merit further and deeper analyses.

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