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THE ROLE OF ENVIRONMENTAL EDUCATION IN FOSTERING CLIMATE CHANGE AWARENESS AND ACTION

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ABSTRACT:

In furtherance of this study, this paper explores the significance of environmental education in raising awareness about the climate change issue as well as an urgent call to action. Well, there is increasing concern about the issue, much attention needs to be paid to the ways, in which education can combine both aspects. Environmental education is a valuable method to facilitate the public awareness on the climate change science, repercussions of climate change as well as sustainability. From the position of both scholarly studies and practical experience, this paper aims at identifying how EE programs in schools and communities and media campaigns assist in enhancing climate literacy. The paper includes real-life examples that show how participants succeed at changing their behavior and advocating for ecological policies after going through environmental education programs. Moreover, it also describes some

activities for effective implementation of environmental education as well as problems and constraints include lack of resources and low EE awareness, among others. In highlighting these possibilities and exploring novel strategies, this study demonstrates how environmental education may serve as a powerful agent for personal and communities' change towards positive climate action. It is the argument that promising environmental education as an apartheid between curricula and mob talk needed to grow a generation ready to face climate problems and change.

INTRODUCTION

Climate change is one among the biggest issues in the world, affecting the climate system, economy, and the people's livelihood all over the world. As evident, tackling the multifaceted issue of obesity calls for more than just technological advances and politico-legal measures; what is needed is an ardent and knowledgeable populace (Dittmer & Riemer, 2012). In this regard, environmental education has become one of the primary components of such initiatives since it serves as the basis in increasing people's understanding of climate change and engaging them towards appropriate action (Thor & Karlsudd, 2020). Environmental education is an all-inclusive process that involves the formulation of plans and putting into practice measures that would improve the knowledge that people have about the surroundings and the effects they have on the environment (Karpudewan & Mohd Ali Khan, 2017). It aims at helping to foster an enlightened citizenry on whom the responsibilities of decision making, and the key tasks of action in solving environmental problems must devolve (Trott, 2020). Combining concepts on climate change, sustainability, and ecosystem interconnectedness, effective environmental education inform and motivates learners to practice active climate change mitigation. It does this by examining the importance of environmental education as a means of increasing the understanding of climate change and the necessary measures (Hungerford & Volk, 1990). It goes further and explores how, irrespective of whether they are global, national or local and how, they can improve climate literacy and foster positive behavioral change. This study looks into the various strategies and practices that have been successfully implemented in other similar programs, as well as the possible limiting factors on the effectiveness of environmental education, in order to develop particular strategic recommendations with regard to improving its impact (Potter, 2009). Consequently, it is

significant to raise the issue of education to the highest possible level, given the climate change which is taking shape (Li & Monroe, 2019). Reading about how the concept of climate change message can be conveyed in a way that captures the attention of a particular audience and elicits pro-active action toward creating a sustainable future is critical (Braun et al., 2018). This paper has examined the significance and role of environmental education to bring change, which is crucial when the world tackles issues related to climate change and the environment (Monroe et al., 2019).

THE MEDIATIONAL ROLE OF COLLECTIVE GUILT

Collective guilt is defined as people's emotional reaction that irrespective of their direct involvement bears a certain degree of responsibility for an injustice occurred in a society, and it seems to be an outstanding mediator affecting climate change awareness and action. The described psychological construct can help to motivate and shape people's behavior, as well as the behavior of certain groups, towards the creation of environmentally friendly attitudes and active steps towards the prevention of climate change (Wi & Chang, 2019). Collective guilt occurs where people accept the responsibility of group for causing harm to the environment like carbon emission beyond limits or felling of trees, leading to various negative impacts on planet Earth. This acknowledgment can create a feeling of ethical obligation and an undeniably sloppy wish to redress the injury done. In the context of EE, collective guilt is an affective tool that could increase the efficacy of the educational approaches because people are vulnerable to guilt as Social Identity Theory and the studies by Smith et al. (2012) demonstrate. Several of the environmental education programs described were effective in using activities that explained human impact and climate change with participants feeling guilty as a team. It can promote engagement as the change in emotional state thus acts as a link between awareness of climate change and the subsequent behavioral change. Guilt implies that when people are made to embrace collective guilt, they will be willing to go an extra mile to support, endorse and advocate for change in policy, embrace policies and practice behaviors that will reduce and contain Greenhouse gases. Furthermore, collective guilt may also promote the feeling of identification with the collective along with the beliefs of collective efficacy that is vital in motivating a large group of individuals towards environmentalism. It cannot be used to facilitate cooperation, which is a key element in many environmental concerns and endeavors. This unity

is particularly desirable and necessary in today's global concerns like climate change which need the input of everybody and every sector. Nevertheless, the use of collective guilt has to be approached cautiously as a tool utilized in the process of environmental education. Despite the fact, guilt can promote prosocial behavior, when exerted in large doses or when inadequately managed, it forms feelings of powerlessness, negation, or diminishing interest. Criticizing is not exclusive for teachers, but therefore educational strategies should bring ways to empower the individual besides making him/her feel guilty to promote collective guilt that can change the environment (Varela-Losada et al., 2016).

To sum up, collective guilt plays the essential role as moderating variable in the connection of climate change awareness and action. Thus, this paper argues that when this emotion is utilized, environmental education can shape people/communities into positive forces that promote sustainable practices and fight for climate change. Detecting the mediational role of collective guilt in the process of behaviour change can increase the effectiveness of the focus addresses, leading to a more effective society in combating climate change.

STUDY 1

METHOD

PARTICIPANTS

Study 1 recruited 300 adults across the AG: 80 High school students, 120 college students, and 100 adults from the community between the ages of 15-60. Data was collected with the help of volunteers who were either students at some of the participating universities or employees of community organizations promoting environmental awareness.

PROCEDURE

It utilized a parallel quantitative and qualitative design, with questionnaires and interviews. Before conducting the survey, participants received a multi-day environmental awareness raising initiative in the field of climate change, involving workshops, presentations, and practical

exercises on playing an ecological part recalling such measures as changing attitudes and behaviors towards using resources sustainably.

DATA COLLECTION

Self-administrated pre and post intervention questionnaires to assess climate change knowledge, intensity of guilt and behavioral changes were used to collect quantitative data. Some of them were standardized measures based on questionnaires that have been developed earlier, for example, the Climate Change Awareness Scale (CCAS) and the Collective Guilt Scale (CGS), while others consisted of custom-made questions related to participants' intention to perform pro-environmental behaviors. Secondary data were collected after the program's practice of the educational intervention in the form of non-numerical responses. These interviews aimed at understanding how participants felt during the interviews in general and whether they experienced collective guilt feelings, as well as at examining their preparedness for behavioral changes in the future.

ANALYSIS

To address the first research question, quantitative data were analyzed using paired t-tests to compare pre- and post-intervention scores; and for the second research question, regression analysis was used to determine the net effect of collective guilt on the relation between climate change awareness, behavioral intentions. The qualitative data collection was adapted to thematic analysis with the aim to reveal the motifs associated with collective guilt and the motivation for action.

RESULTS

Finally, the quantitative data showed improvement in to the level of perceived knowledge about climate change and more importantly the level of collective guilt after the intervention. The observations for the M=3. The mean number of outpatient mental health visits for the total group pre-intervention was M= 2 (SD= 0. 8) and post-intervention was M=4. 5 (SD=0. 7) post-intervention ($t(299)=15.34, p<0.001$). Likewise, there was a significant increase in only the

Collective Guilt Scale (CGS) scores which grew from $M=2.8$ ($SD=0.9$) to $M=4.2$. Thus, a parallel pattern of results is indicated in terms of exploiting abuse potential by endorsing negative attitudes toward alcohol advertising and supporting restricted access to alcohol advertisements. 2.8 ($SD=0.8$) ($t(299)=13.76, p<0.001$).

In mediated regression analysis, we found that increased climatic change awareness positively predicted collective guilt, which in turn was positively related to self-reported pro-environmental intentions ($\beta = 0.42, p<0.01$). Self-identified high collective guilt was reflected in higher plan and strong intention to perform various pro-environmental actions including conserving energy, recycling, and promoting environmental policies. Qualitative analysis identified three major themes: The three factors identified include: (1) awareness of individual accountability and group stewardship (2) emotional reactions and ethical obligation and (3) call to action. Peer criticism and feelings of joint responsibility and personal obligation to intervene were raised by participants often; many of them credited the educational program for this development.

Measure	Pre-Intervention	Post-Intervention	t-	p-
	Mean (SD)	Mean (SD)	value	value
Climate Change Awareness Scale (CCAS)	3.2 (0.8)	4.5 (0.7)	15.34	< 0.001
Collective Guilt Scale (CGS)	2.8 (0.9)	4.2 (0.8)	13.76	< 0.001

Regression Analysis	β -	p-
	value	value
Collective guilt as a mediator between climate change awareness and pro-environmental behavioral intentions	0.42	< 0.01

Note: The paired t-tests show significant increases in both climate change awareness and collective guilt after the intervention. The regression analysis indicates that collective guilt

significantly mediates the relationship between increased climate change awareness and behavioral intentions.

DISCUSSION

The results of Study 1 clearly support the roles of environmental education in raising perceived and actual knowledge on climate change, and producing feelings of collective guilt, which leads to increased intentions to act pro-environmental. The assessment results highlighted the fact that there was a perceivable growth in the level of awareness and submission to collective guilt after the intervention, which signifies the potential of the designed educational program to engineer meaningful change in the participants with regards to their emotional involvement in climate change matters (Nicol, 2014). Discussion of the mediational role of collective guilt, under attack for its function as an emotional impetus to action, thus remains relevant. When the participants identified the negative impact of their group on the environment, it provoked them into a greater concern for environmental issues and they sought to change their behaviors (Paradewari et al., 2018). This implies that environmental education should go beyond just an information delivery device whereby people's feelings and morality are not engaged. The qualitative information also supports the endorsement of the overall idea that collective guilt can enhance people's effectiveness, as it was put in balance with the empowering interventions. Participants' stories provided here also highlighted the demand for solutions that were given within the framework of the educational program and how it transformed guilt into a productive force rather than distressing the participants (Walker, 2017). Taken as a whole, Study 1 illustrates that environmental education can assist in the task of climate change enlightenment and encourage active pro-environmental activities through the elicitation of collective guilt. To address such gaps, the future program should include aspects of creating emotions that inspire collective feelings and provide tangible opportunities for the process of contributing to climate change.

STUDY 2**PARTICIPANTS**

Study 2 consisted of 200 participants and the authors recruited all of the participants from a university, where the participants were between 18 and 30 years old. The participants included students from different fields of study with the view that, each discipline, approaches the environmental problems in its unique way.

PROCEDURE

In regard to the study design, the research employed an experimental approach, specifically with a control group. They were grouped into the experimental group which especially underwent an intricate and extensive environmental education or the control group that used little or no environmental education at all throughout the course of the study.

INTERVENTION

To integrate environmental education into the project and enhance the knowledge of children in the experimental group, the following activities for a period of four weeks were applied: a series of workshops, presentations and discussions, lectures in the form of multimedia presentations. Discussed subjects included climate knowledge, anthropogenic influence on the climate, and Climate Responsibility and Sustainability.

DATA COLLECTION

To measure the degree of awareness on climate change, guilt and one's behavioral intention, pre-intervention and post-intervention questionnaires were administered. The surveys included the same measures as in Study 1, meaning Climate Change Awareness Scale (CCAS) and Collective Guilt Scale (CGS). In gathering test results, emphasis was made on the qualitative data which were obtained through focus group discussion with the experimental group participants after the intervention. This was achieved through various group discussions that sought to elicit their personal experiences, feelings and reasons that would make them change their behavior.

ANALYSIS

To compare differences between the experimental and the control condition, the data of the quantitative measures were analyzed by means of a 2 × 2 ANOVA focusing on the changes. Data collected from qualitative natured focus group discussions were analyzed using themes analysis with a view of determining the extent of collective guilty and necessary behavior changes.

RESULTS

QUANTITATIVE ANALYSIS

Measure	Experimental Group Pre-Intervention Mean (SD)	Experimental Group Post-Intervention Mean (SD)	Control Group Pre-Intervention Mean (SD)	Control Group Post-Intervention Mean (SD)	F-value	p-value
Climate Change Awareness Scale (CCAS)	3.3 (0.7)	4.7 (0.6)	3.2 (0.8)	3.3 (0.7)	45.62	< 0.001
Collective Guilt Scale (CGS)	2.9 (0.8)	4.4 (0.7)	2.8 (0.9)	2.9 (0.8)	40.85	< 0.001

REGRESSION ANALYSIS

Regression Analysis	β-value	p-value
Collective guilt as a mediator between climate change awareness and pro-environmental behavioral intentions	0.47	< 0.01

QUALITATIVE ANALYSIS

Thematic analysis of focus group discussions revealed three primary themes: Thematic analysis of focus group discussions revealed three primary themes:

- **Enhanced Understanding and Awareness:** Participants reported a deeper understanding of climate issues and their personal impact.
- **Emotional Engagement:** Many participants expressed strong emotional responses, including collective guilt, after realizing their role in contributing to climate change.
- **Motivation for Action:** The intervention motivated participants to consider and adopt more sustainable behaviors, such as reducing waste and advocating for environmental policies.

DISCUSSION

The findings of Study 2 do support the arguments made in Study 1 and substantiate the importance of enhancing environmental education to foster climate change awareness and reduce collective guilt. The comparison of the results of the research on both the experimental and the control groups showed that the members of experimental group, who have undergone the intervention, increases significantly their awareness and collective guilt in contrast to the members of the control group. By using the mediation analysis, the results of the study supported the hypothesis and revealed the significance of collective guilt in the transition from accepting information on climate change to the adoption of suitable behaviour patterns for the environment (Littledyke, 2008). Collective guilt based on perceived higher personal responsibility for environmental pollution informed greater likelihood of reporting intentions for environmentally friendly behavior. The results of the self-generated thoughts supplement the results obtained, reflecting the affective and cognitive aspects of the change processes (Kenis & Mathijs, 2012). The participants also pointed out that the educational intervention not only provides them with the information but also stirred their emotions and passion making them feel moral responsibility toward the relevant issue and motivating to act. Based on these premises, it can be inferred that such strategies could be developed where aims to stimulate emotions behind the environmental

education programs such as collective guilt. Such programs help to make people understand what is factually accurate about sustainability and climate change and at the same time appeal to viewers' emotions thereby creating a more profound sense of personal responsibility towards the world and the actions required to save it (Allen & Crowley, 2017). In summary, Study 2 provides further support for utility environmental education as means of enhancing climate change knowledge and promoting behavioral change. Further studies on this area could involve focusing on the efficacy of the programs used to enhance education, how these programs affect the feelings and behaviors of people, and how the findings can be applied across a variety of ethnicities and gender (McGuire, 2015).

GENERAL DISCUSSION

Combined, the two work under study in this paper demonstrate the importance of environmental education towards enhancing climate change understanding and mitigation. Two separate and distinct research studies, conducted with different samples and using variations in methods, produced results that were highly similar for each investigation in terms of the findings that educational interventions can play a critical role in increasing climate literacy and fostering behavioral change through the moderating variable of collective guilt. In the analysis of Study 1, it was done to test the hypotheses and was revealed that there were statistically significant increases in the level of climate change awareness and collective guilt after the environmental education program involving participants with different background characteristics, and collective guilt played a significant and independent role in mediating the relationship of change in awareness with the behavioral intentions (Öllerer, 2015). In study 2, which was conducted on university students through an experimental approach and used a control/comparison group, we obtained support for these findings where results showed significant improvement in awareness as well as collective guilt in intervention group as compared to control group and moreover, collective guilt emerged as the mediator between awareness and behavior. Hence, the study gives insights about the role of emotional appeal, as cultivating a sense of collective guilt is instrumental in encouraging people to act on climate change. But as always, it should be done in moderation, because offering hope is necessary, and providing the means to deal with it empowers people and does not make them feel that they are helpless (Chawla & Cushing, 2007).

The effectiveness of the various formats supports the relevance and generalisability of the approach, suggesting that specifically targeting the audience can amplify the results. More future studies should be conducted to determine the residual consequences of such an intervention over time as well as its relevance to different cultural settings. In sum, the studies underscore the importance of including proper environmental education as part of curriculums, talking points, and initiatives to secure cooperation an intervention needed to mitigate the effects of climate change.

LIMITATIONS OF THE PRESENT RESEARCH

In view of the positive evidence outlined within this paper, it is sensible to consider certain limitations of the researched studies. First, both the studies were based on self-reported data and the latter is likely to result in social desirable responding pattern implying that participants may provide more positive results regarding their climate awareness or sense of environmental responsibility than actually is the case. Also, considering that other studies have shown that increased awareness and intervention could take time before intervention and changes in awareness and behavior could be seen, the duration of the interventions in these two studies can be considered as short. The samples used in Study 1, however, were relatively diverse but restricted to only students and other residents in certain geographical areas, thus possibly underestimating participants from more diverse cultures or other economically disadvantaged communities. Lastly, the exclusive reliance on collective guilt as the primary affective mechanism may have lost sight of other potential affective front and back ends such as hope or fear that might facilitate a behavioural change. Last but not least, though this study utilised qualitative data and gave important findings, the number of participants that underwent interviews and focus group discussion may not be able to give a comprehensive view of participants' experiences and perceptions. These limitations must be avoided in future research by use of longitudinal study designs, recruitment of participants from diverse demographic backgrounds and examining other facets of emotional response to environmental education.

CONCLUSION

Finally, it is argued that environmental education can/should contribute significantly towards climate change literacy and people's propensity to behave in ways that are less detrimental to the

planet. The two estimates state that effective educational interventions can considerably enhance climate knowledge and mobilization of the guilt of all participants; this is a potent call to action to improve people's sustainability behaviors. The outcomes highlight affective commitment to bodily actions in the course of educational programs and stress that applying the mechanism of collective guilt might help to enhance conscientiousness of individuals. At the same time, one should not just engage in an emotional response – guilty feelings or anger, for instance – without empowering practices and plans of action to avoid the experience of depression. While these returning limitations have reduced prospects of objective evidence due to issues of self-reporting, short age of interventions, and sample diversity, the research has still managed to present the assumptions of how environmental education can transform behaviours. Thus it is suggested that future research initiatives should endeavour to establish research gaps and undertake further studies of the long-term impacts and possible extension of similar educational intervention programs. In conclusion, it is critical to outline the ways in which quality environmental education can be incorporated into curricula and referenced in public discussions toward the goal of encouraging collective action to address climate change.

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