



Impact of environmental education Programme on Learners attitude in the selected schools of North West Province of South Africa

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Abstract

The implementation of environmental education programme within North West Province has a history of over a decade. It is at the backdrop of accountability that a systematic and sound, programme evaluation was initiated through the current study. Hence, the current study primary research problem is to investigate the impact of the environmental education (EE) on attitude towards the environment of youth participating within EE. The qualitative search methodology approach was used with the use of standardized questionnaires. The sampling was done through same focus group using local vernaculars applicable within North West Province. Independent t-test and one way ANOVA was computed. The findings revealed a comparatively high mean score ($M = 49.93$, $SD = 6.98$) attitude towards the environment of youth. The overall mean attitude ($M = 2.83$, and $SD = 0.36$) towards the environment was slightly lower compared to post-exposure results from other studies. No significant difference in mean attitude toward the environment as a result of gender and age groups was found. However, a statistical significant difference was found as a result of residential district municipality, with youth from Dr Ruth Segomotsi Mompati District Municipality ($M = 3.02$, $SD = 0.41$) having a much higher attitude towards the environment than that of Bojanala Platinum District Municipality ($M = 2.80$, $SD = 0.34$). No significant different between Dr Kenneth Kaunda District Municipality ($M = 2.83$, $SD = 0.38$) and Ngaka Modiri Molema District Municipality ($M = 2.79$, $SD = 0.34$) and Bojanala Platinum District Municipality ($M = 2.80$, $SD = 0.34$). In conclusion the current finds were comparable with post exposure mean scores attitude toward the environment studies, which suggest EE programme impact in attitude towards the environment on youth. It is therefore recommend that a pre- and post-exposure studies be conducted in order to credit impact from the EE programme.

Keywords: environmental attitude; environmental awareness, environmental education

A. Introduction

This study looks at the impact of EE on learners attitude towards the environment of selected school within four districts in North West Province. The contextual approach of the study is guided by the need to provide credible scientific evaluation of EE. The paper provides literature review on EE and similar studies elsewhere as basis of the study. The section that follow provide research methodology, which outline how study was conducted. Results were outlined and presented using descriptive and inferential statistics. The similar studies were used to compare the findings after which conclusions and recommendation were drawn.

The purpose of the study was to evaluate the impact of EE programme on attitude of selected learners within North West Province. This was then used to assess the effectiveness of the EE programme initiated by North West Provincial Government. This was viewed to be important in that if positive attitude towards the environment is instilled at tender age environmental activism can be carried over to adulthood. Furthermore, youth as future generation will be able to make an informed and meaningful contribution toward the environment. The research objectives covered by the current study were to determine demographic characteristics of EE youth club respondents; and to evaluate the level of attitude of learners towards the environment. This study address the following research questions: what is the level of attitude towards the environment of the learners exposed to EE and does demographic variables have influence on the levels of attitude towards the environment among learners participating in environmental education.

Hart and Nolan (1999:1), as early as late 90's globally EE has already been a focus of several studies, evident by the large number of research publications. The importance of high-quality EE programme are their ability to create environmental awareness, environmental consciousness and change values, attitudes and behaviour towards sustainable environmental conservation within the community as stated by Bentley (2000:23), Power (2004:28), and Walsh-Daneshmandi and Maclanchlan (2006:16). As stated by Carleton-Hug and Hug (2010:159), the consistency and systematic evaluation of such programme can provide a powerful baseline for improvement and enable programme to achieve more of their objectives and goals.

The top five major challenges and risks facing global economic development are related to the environment with recorded average likelihood and impacts being in the range between 4.4 - 5 and 4.6 - 5.7 respectively (WEF, 2016:13). The first Intergovernmental Conference on EE organized by United Nations Educational, Scientific and Cultural Organization (UNESCO) in cooperation with United Nations Environmental Programme (UNEP) held in Tbilisi from the 14th to 26th of October 1997 lead to global appreciation of the need to have EE programme strategies that are coherent internationally nationally and regionally. According to Nath (2016:2); Newman and Fernandes (2016:154); UNESCO (1997), the agreed purpose of the outcome of the conference were seen as a vehicle to shape behaviour, change attitudes, encourage problem solving, protect and rehabilitate the environment, improve the health of the world's ecosystems, prepare and promote active involvement of communities in their surroundings.

The overall number of organizations that are directly interested in environmental issued in South Africa are more than 300, ranging from state and semi-state institution, profit and non-governmental organization as reported by Cornwell (2009:82). As stated by Rego and Muthoka (1990:22) education is a critical process in development. Reddy et al. (2004) stated that EE as a practice is as old as human existence. The main aim of EE programs is to enhance knowledge, literacy, and general understanding of the environment and promote citizenship (Carleton-Hug & William, 2009; Reddy et al., 2004:111; Stern et al., 2008:31). It is from that basis that general environmental attitudes and behaviour, concern and awareness pertaining to the environmental condition is raised and commitment is gained (Bogner, 1998). The need to create environmental aware is as a result of substantial studies that has

shown that human activities have a negative impact on the environment. The general approach for youth EE is through outdoor education or camps (Arnold et al., 2009; Christensen, 1993:41), which are designed such that there is integration of theoretical and practical learning by exposing youth to environment at first-hand (Chawla & Cushing, 2007; Stern et al., 2008); exposed to adventure-based challenges e.g. poaching, hiking trail, and flora and fauna identification. As summarised by Cornwell (2009:83) EE institutions and project within South African are extremely diverse.

It is encouraging that there is scientifically supported evidence of preschool (Musser & Diamond, 1999:29), primary school (Bergman, 2016:480; Shay-Margalit & Rubin, 2017:112), secondary school (Christensen, 1993:152; Kefela and Rena, 2008; Cruz & Tantengco, 2017:49; Jackson et al., 2016:70; Komane, 2005:55; Kumar et al., 2016:820; Malkus & Musser, 1997:4; Olufemi et al., 2016:56; Ozdemir, 2016:161), and university students (Kney et al., 2016:3; Prati et al., 2017:176; Richards et al., 2017:117; Schultz & Zelezny, 1999:263) showing awareness, knowledge, attitude and behavioural change towards environment as a result of their exposure to EE. As observed previously, youth can serve as a strong voice in calling political heads to account for environmental decisions. As stated by Driskell (2002:134) EE is one of the ways through which youth's cognitive skills can be targeted. It is logical for countries to streamline resources that will develop capacity for youth to be actively involved in local and global environmental issues (Kefela and Rena, 2008; Bergman, 2016:497; Erhabor & Don, 2016:5367). Within South African context the EE program initiatives are in line with principle 4(q) of the NEMA (Van der Linde, 2010:38) which is to empower youth so that they can have a meaningful participation and make an informed decision regarding environmental issues.

As mentioned by Kil (2016); Thompson et al. (2002:6); Thomson and Hoffman (2010), there is an increasing need globally for accountability and performance measure both from public and private funders and the EE programme is not excluded. The statement by Cooke et al. (2016:159) supported this; "measuring of environmental awareness based on scientific criteria is becoming increasingly interesting to scientists working in different disciplines; only things that can be measured can actually be managed. Globally the tendency is to ensure that there is value for money. Within the South African context, because of accountability and limited financial resources, government has put more emphasis on monitoring and evaluation; this has been more apparent by the establishment of a monitoring and evaluation portfolio within the presidency office (Ramafolo, 2012:13).

Systematic evaluation of EE programme has direct benefits by improving the programme as stated by Salvatierra da Silva et al. (2016:322), which can be linked to teaching or delivery approach, learning activities and instruction resources as per findings by Christensen (1993:78). EE programme evaluation can also assist a programme to see if objectives and goals are met, and provide a mechanism for improvement and achieving goals such as growth in participants learning by improving learner's knowledge, change in attitude and behaviour (Christensen, 1993:79; Grúňová et al., 2017:14); (Kefela and Rena, 2008); (Johnson & Činčera, 2016:97); Thomson and Hoffman (2010). It can also assist in identifying participants' learning needs and measuring participants' achievements, improve environmental management according to Carleton-Hug and Hug (2010:121) and Christensen (1993:79). Furthermore, EE evaluation can greatly assist in the improvement of logistic support of the entire programme e.g. planning, implementing the plan, communication, marketing and getting funding, reporting and monitoring and evaluation. As stated by Christensen (1993:27) and Salvatierra da Silva et al. (2016:312) it can importantly increase EE programme credibility.

B. Methodology

1. Research Design

The present study used the quantitative research design, Bryman and Bell (2015:382) define a research design as framework for collection and analysis of data. Furthermore as stated by Ndebele and Lavhelani (2017:345), it serves as a blueprint guiding study collection, measurement and analysis of data.

2. Population and Sampling

Population is defined as units from which a research sample is to be collected (Bryman & Bell, 2015:381; Gomez & Gomez, 1984:533; Levin & Rubin, 1981:9; Sheldon, 2005:5; Weiss, 2012:4). The targeted population included a total of one thousands one hundred and four registered EE youth club members according to 2013 database. The study unit of analysis consisted of selected learners from four districts within North West Province. For the purpose of statistical power and standardization, the criteria followed when selecting respondents was EE enrolment data base provided by the responsible institution. The unit of analysis was sampled such that fair representative of targeted first unit of study was achieved with at least 3% margin of error at 95 confidence. However at the time of sampling which was done during camp at least 100% of youth who participated in the EE youth camp that was held at Borakalalo Nature Reserve were sampled, whereas only 89% of participants during Provincial camp at Rustenburg were sampled. The unequal representation of district municipality was because of logistic arrangements of transporting EE youth club members to camping areas. The second attend of getting more participants from other three district municipality could not yield desired results. However at the time of sampling which was done during camp at least 100% of youth who participated in the EE youth camp that was held at Borakalalo Nature Reserve were sampled, whereas only 89% of participants during Provincial camp at Rustenburg were sampled. The unequal representation of district municipality was because of logistic arrangements of transporting EE youth club members to camping areas. The second attend of getting more participants from other three district municipality could not yield desired results.

The distribution of questioners was done by the researcher with the assistance of officials who are responsible for implementing the EE program within North West Province during EE camps at Bojanala District Municipality in a similar approach to focus group. The semi focus group was constituted of ± 15 learners. The questions were read by respondents and interpreted by peer together with researcher, were necessary further explanation was done in using Setswana which is a local language. Another set of questionnaire was distributed during the EE youth club camp that was held in Rustenburg.

3. Instrument and Data Collection

The data collection method used in the survey study was a valid and reliable self-administered questioners collected through standardised questionnaires. The questionnaire had two sections (a) details of the EE youth club, demographic age and gender, residential area and name of district; and (b) attitude scale. The first sets of questioner was a 2-page structured survey constituted of twenty (20) likert-type scale closed ended questions addressing Children's Attitude Towards the Environment Scale (CATES) adapted from similar study conducted by Musser and Malkus (1994:23). The standardised Likert-type scale closed-ended questionnaire were administered to selected EE youth club leaners. Leaners responded voluntarily and were not compensated for their participation.

4. Data Analysis

All participants received the similar questionnaire with the same and equal number of items. Completed questionnaires were collected immediately. Data was captured on Microsoft Excel data sheet and exported to IBM's SPSS version 25 for further analysis.

C. Findings and Discussion

1. Findings

Biographical Data

There were 426 respondents, of which 53.0% (N = 226) were females, 43.7% (N = 186) were males and 3.3% (N = 14) did not indicate their gender as shown by pie chart Figure 1.

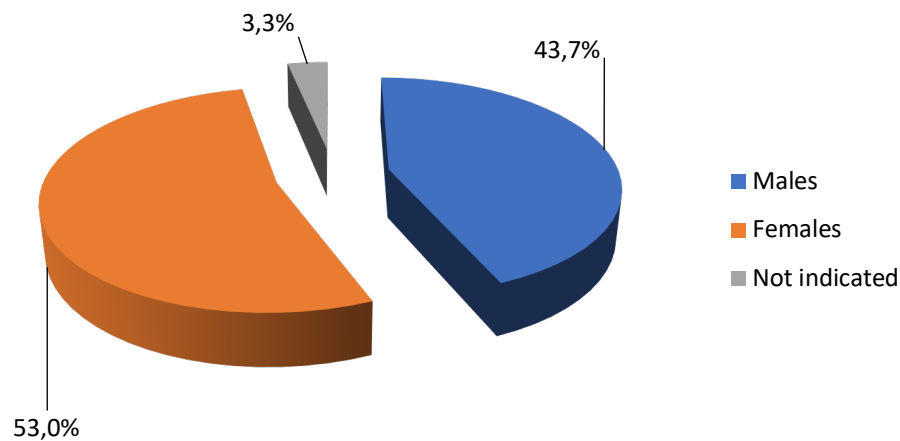


Figure 1. Pie chart indicating gender profile of respondents in percentage (n = 426/)

The respondents age ranged between 8 and 32 years (M = 13.6 years; SD = 3.92). As indicated by the Table 1, respondents were grouped into five age groups, with the highest number 48.8% (n = 208) of respondents constituted of the age group 8-12 years, followed by age group 13-17 years with 31.5% (n = 134) respondents. The lowest number of respondents were of the age group 28-32 years with 1.4% (n = 6).

Table 1. Five Age groups of respondents

Age in years Groups	N	%
8-12	208	48.8
13-17	134	31.5
18-22	39	9.2
23-27	11	2.6
28-32	6	1.4

As shown by the pie chart in (Figure 2), the highest number of respondents were from Bojanala District Municipality followed by Dr Kenneth Kaunda District Municipality with 60.8% (N = 259) and 19.0% (N = 81). The lowest number of respondents were recorded from Dr Ruth Segomotsi Mompati and Nyaka Modiri Molema District Municipalities with 12.2% (N = 52) and 7.7% (N = 33) respectively.

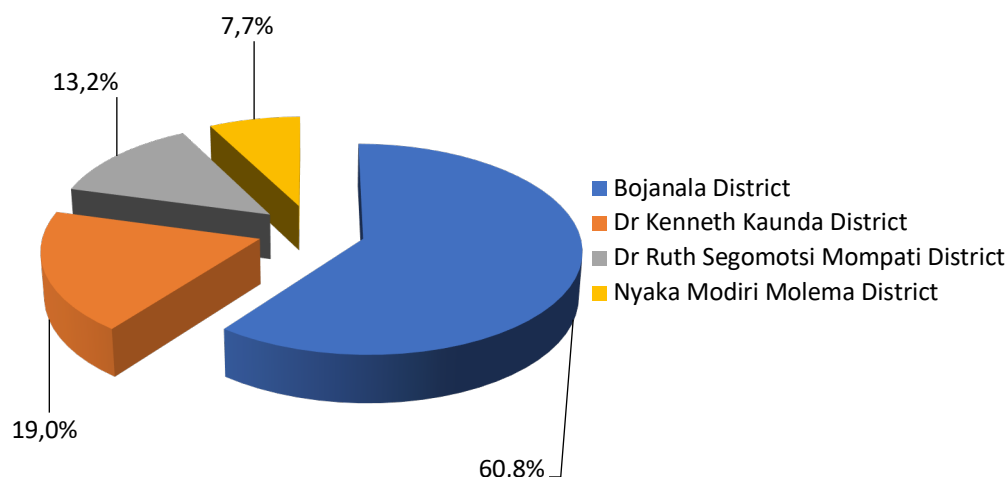


Figure 2. The demographic information of respondents per four district municipalities within North West Province (N = 426).

Validity and Reliability of Scale Scores

The degree to which CATES is able to measure attitude towards the environment for environmental education program was determined using screen analysis indicate the validity of a seven-factor solutions for the dataset. The subsequent seven solutions, after verimax rotation, resulted in the eight factor with an eigenvalue of 1.2.

CATES internal consistency reliability range from 0.70 to 0.85 and an acceptable test-retest reliability of $r = 0.68$ as per study by Musser and Malkus (1994:23). The degree to which results on environment attitude of youth participating in an environmental education program can be reliably repeated using the CATES was determined by calculating the internal reliability using Cronbach's alpha. The reliability of the CATES was determined by computing Alpha Chronbach Coefficient, and found to be $\alpha = 0.485$ which is lower than expected. However this was compensated by the Cronbach's Alpha based on standardized item of $\alpha = 0.524$ which was within the acceptable level of 0.5 and therefore accepted to be reliable and suitable for this study.

Demographic Variables Against Attitudes Variables

Effect of gender

Comparative analysis of means score between male and female respondents were computed using independent sample t-test. In terms of attitude towards the environment, no statistical significant differences were found to occur between males ($M = 2.84$, $SD = 0.37$) and female ($M = 2.84$, $SD = 0.36$) respondents mean scores participating within EE, $t(410) = 0.018$, $p = 0.98$ as indicated by plot box in Figure 3.

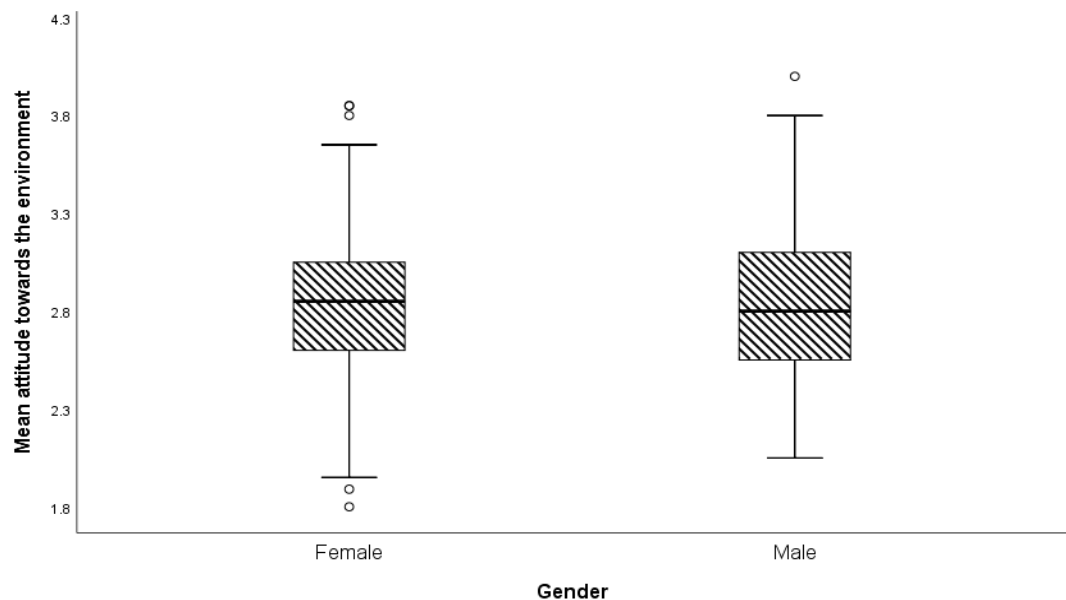


Figure 2. Plot box showing mean attitude towards the environment in terms of respondent's gender

Effect of age

One-way ANOVA comparative analysis of difference in attitude of respondents towards the environment as results of age group and residential district municipality were computed. In terms of attitude, statistical significant differences were found to occur between age groups ($F = 2.599$, $df = 4$, $p = 0.036$, with the mean attitude as indicated under Figure 4). The difference was found to be very small, only prevalent between 8-12 and 18-22 age groups with mean attitude $M = 2.89$, $SD = 0.324$ and $M = 2.69$, $SD = 0.326$ respectively as per Post hoc test. No statistical significant difference in attitude towards the environment was found between 8-12 ($M = 2.87$, $SD = 0.3240$), 13-17 ($M = 2.86$, $SD = 0.376$), 23-27 ($M = 2.77$, $SD = 0.300$), and 28-32 ($M = 3.02$, $SD = 0.563$) age groups.

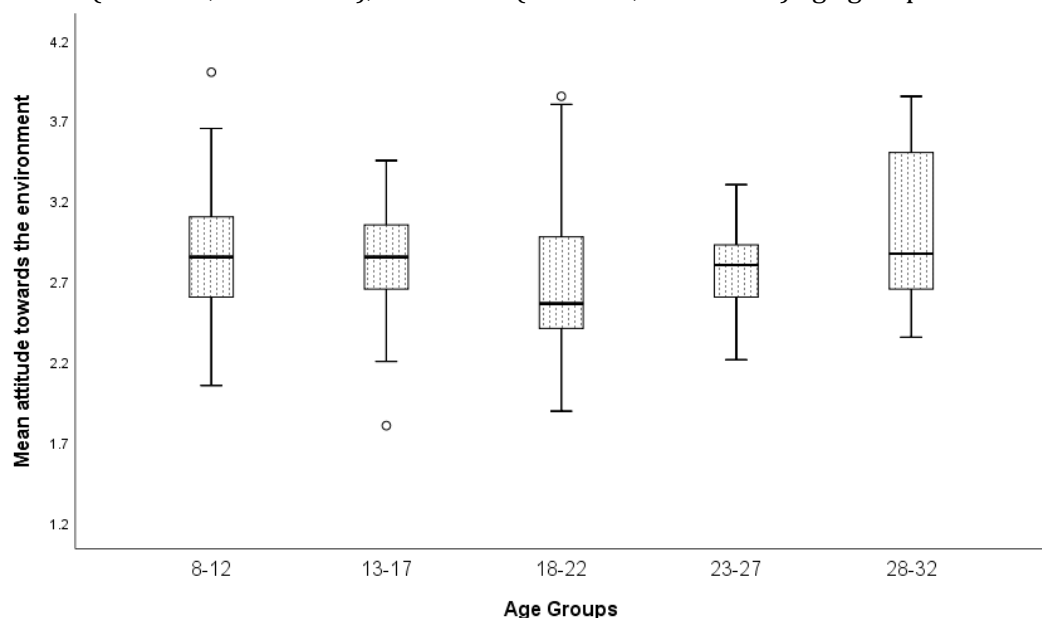


Figure 3. The Plot box showing mean attitude towards the environment in terms of respondent's age groups.

Effect of residential district municipality

A one-way between groups ANOVA was computed to explore the impact of district residential areas on attitude mean scores towards the environment between respondents. Respondents were divided into four groups according to the district municipalities in at which schools are found. There were statistically significant differences at the $p < 0.001$. The statistical significant differences were quite small. As shown using box plot Figure 5, Post-hoc comparisons using the Tukey HSD test indicated that the mean score for respondents from Nyaka Modiri Molema ($M = 2.79$, $SD = 0.34$), Dr Kenneth Kaunda ($M = 2.83$, $SD = 0.38$), and Bojanala District ($M = 2.80$, $SD = 0.34$) were significantly different from Dr Ruth Segomotsi Mompoti District ($M = 3.02$, 0.41) according to Post-hoc analysis.

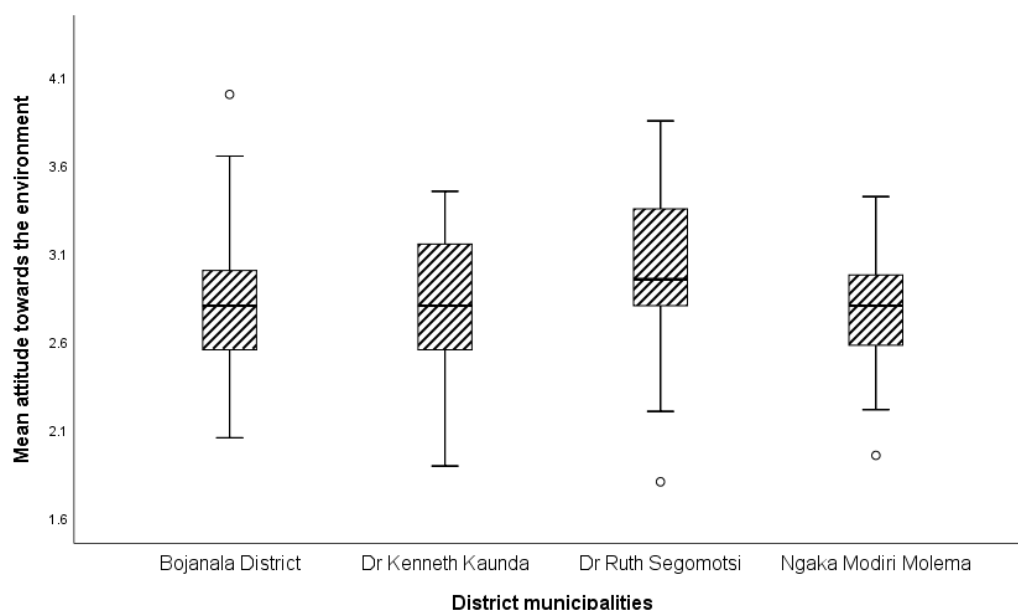


Figure 5. The Plot box showing mean attitude towards the environment according to respondent's residential district municipalities

2. Discussion

As per study by Erhabor and Don (2016), the overall mean attitude of EE youth club respondents (Mean score = 49.93, $SD = 6.98$, higher than statistical mean = 28.5) toward the environment shows similar trends to what has been obtained in other studies (Mean score = 38.64, $SD = 4.29$, higher than statistical mean = 0.24), which indicates that EE youth club respondents have a positive attitude towards the environment. However, Likert scale mean value of EE youth club respondents attitude towards the environment ($M = 2.83$, and $SD = 0.36$) was found to be slightly low compared to post-project survey ($M = 4.13, 4.04, 3.50$ and 4.02) finding of a pre and post-project analysis done by Ahmad et al. (2015); Ernst et al. (2017:160); Grúňová et al. (2017:8); Sousa et al. (2016:6) respectively.

The current findings were comparable to the study by Grúňová et al. (2017:8); Pothitou et al. (2017:408); Rakotomamonjy et al. (2015); Shay-Margalit and Rubin (2017:122), since no statistically significant difference in mean score attitude towards the environment as a result of gender were found (t -test $p > 0.05$) among sampled youth exposed to EE. The current findings are contrary to a study by Bergman (2016:486); Jackson et al. (2016:77); Masud and Kari (2015); Newman and Fernandes (2016:172) who found a significant difference due to gender. Nevertheless the fact that there seems to be a slight difference in attitude towards the environment by gender should be a concern to the implementers of the programme in order to eliminate possible barriers.

No meaningful statistical significant differences between age groups were found to occur in attitude towards the environment among youth exposed to EE as observed by the study which was similar to the study conducted by Grúňová et al. (2017:8); Prati et al.

(2017:188) and contrary to findings by Jackson et al. (2016:77). The slight significance difference recorded was noted in the 28-32 age group with a lower mean score and a statistically significant difference on mean scores attitude towards the environment, which is contrary to previous findings of 16 - 19 of age, which was suggested to be due to the educational experience of the secondary students in Hong Kong. The younger age was also found to have a much higher mean score attitude towards the environment in most of the items which are in support of the findings by Bergman (2016:486); Grúňová et al. (2017:14); Malkus and Musser (1997:12).

Similar to the study by Verma (2016:185), the current study finds a statistically significant difference between respondents due to residential district municipality. The importance of considering prevailing local conditions was also supported with a model from the study which was conducted by Davino et al. (2017:14), which found a strong positive relationship between local awareness and motivation for individuals to act in favour of the environment.

D. Conclusion

This study concludes that the mean scores attitude towards the environment of selected learners within North West Province is comparatively similar to other studies. However, the mean attitude towards the environment of learners was found to be lower in comparison to other studies. The EE programme seems to have impact on attitude. There is a need for implementers of EE within North West Province to have pre and post analysis in order to validate the impact of the programme.

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