

Factors influencing the Agricultural Science students' perceptions toward agricultural educational training

*Tsion Tesfaye Kidane, Steven H Worth **

ABSTRACT

This study set out to assess factors influencing high school Agricultural Science students' attitude towards Agricultural Education and Training (AET) in the Province of KwaZulu-Natal, South Africa. Positive and negative factors influencing high school Agricultural Science student attitudes towards Agricultural Education and Training (AET) were identified to inform policy intervention. A sample consisted of 375 students was used from the selected high schools using a nested, concurrent, mixed sampling research design; and both structured and unstructured questionnaires were administered. Racial background, family size, family access to farmland and AET discussions with others had a positive and significant effect on student's AET attitudes. Both Student family monthly income between R500 - R5000 and a mother who has completed high school have a negative and significant effect on student's AET attitudes. Responsible parties are encouraged to create access to farmland for households in urban, peri-urban and urban areas and other income-generating, agribusiness opportunities to improve monthly household incomes.

Keywords: Attitude, Education, High School, South Africa, Student, Training.

Introduction

In global economies, sustainable agricultural development requires trained, skilled manpower for productive, profitable and sustainable agricultural production, agro-processing, agricultural research and relevant policy formulation to benefit all farming sectors (Acker, 1999; Alam, 2009). Both learner knowledge and attitudes have an effect on student behaviors (Wang, Huang and Knerr 2010), because favorable student attitudes and determination could regulate success in agricultural sector development (Méndez, 2011; Talbert and Larke, 1995).

Growing populations and economies in the developing world require innovative food production and processing, ranging from smallholder farming for home consumption to large-scale, capital-intensive, market-orientated production. Developed and emerging agricultural economies, thus are supported by effective education and training to promote job creation and

alleviate poverty (Hamel, 2005; EADGDF, 2010). Trained manpower can support the emerging agricultural economies by implementing innovative agricultural technology and knowledge transfer that can assist to transform agriculture and allied sector industries (Engr and Pascal, 2009). To meet the challenges of globalisation, market competition, unemployment and the question of subsistence farmers requires innovative agricultural information, knowledge and technology and competent vocational skills that will facilitate the application of Agricultural Science in the sector and create agriculture-related jobs and livelihoods.

AET at high school levels aims to provide background agricultural knowledge to learners, to prepare them for further studies in various Agricultural Science, engineering and technology disciplines (Vandenbosch, 2006). Agricultural sector development requires sufficient and available individuals to impart knowledge and skills across all disciplines within broad agricultural fields (Rivera, 2006). Future student achievement and success in post-secondary Agricultural Science education depends on successful secondary school completion (Alam and Farid, 2011). In the context of Agriculture in South African, high quality agricultural science education

* School of Agriculture, Earth and Environmental Sciences, University of KwaZulu-Natal. Received on 6/5/2015 and Accepted for Publication on 17/8/2015.

where theory and practice are well balanced is required to support the growing agriculture sector development and hence, create sufficient job for the youth. However, agricultural careers in South Africa have a poor image among most youth; and poor delivery at secondary schools resulted in high failure rates (DoA 2003 and 2005). There is limited literature available on the factors that influence the perceptions of students towards AET. Much research has been conducted to identify factors that affect perceptions of students and have indicated different principle factors that influence the students' attitude and achievements (Harb and El-Shaarawi, 2006; Marks, 2006; Emmitt et al., 2003; Otsuka 2004; Jegede and Okebukola, 1989; Van Steensel, 2006; Rahuman and Uddin, 2009 and Arias et al., 2004). These include individual, family, socio-cultural, socio-economic and situational factors. Family size, racial background, parent education and family income, emotional support, family values such as respect, strong maternal role, legacy and maintenance of the home language could have significant influence on student's attitude and their academic achievement (Otsuka 2004; Constantinos and Elena, 2004; Otsuka 2004; Kloosterman, 1999).

Identifying factors affecting Agricultural Science student's attitude will inform interventions aiming to improve the delivery and impact of Agricultural Education and Training (AET) in South Africa. The identified factors could support and foster positive attitudes to agriculture and AET, thus contributing to improved social, economic and environmental conditions in South Africa. Within this context, this study was designed to identify factors that could affect high school Agricultural Science student attitudes to AET in South Africa. Identifying factors will enable policy-makers and policy implementers to improve the image of agriculture as a career option through a more effective and relevant Agricultural Education and Training process.

Purpose and objectives

This study investigated what factors influence the attitude of high school students toward AET. The study sought to determine the attitudes of the agricultural science students towards AET and factors that could affect high school agricultural science student attitudes to AET. More specifically, whether the identified factors

would have a positive or negative effect on student attitudes.

Research Methodology

Source of Data and Sampling Design

The study area, KwaZulu-Natal Province is one of the nine provinces of South Africa. The province is located in the eastern part of South Africa. A Nested Concurrent Mixed Sampling Design (NCMSD) was used in this study (Johnson and Christensen, 2012). The quantitative and qualitative data were collected i.e. concurrently, but the qualitative sample was employed as a subset of the quantitative sample (that is, in nested relation) (Johnson and Christensen 2012). Multi-stage random and purposeful sampling were employed to select the 375 students respondents from the total of 69 552 students studying agriculture at high school in the province.

In South Africa, there are a number of agricultural high schools that specialize in providing Agricultural Science modules as a main part of their curriculum. These dedicated Agricultural Schools are established specifically to teach Agricultural Science within the context of the normal high school curriculum. Several rural and urban high schools also offer Agricultural Science subjects as a part of the standard high school curriculum; although not all students in these schools take Agricultural Science. Based on this reality, 10 high schools offering Agricultural Science were selected. The sample students were registered for study Agricultural Science in Grades 10-12 during the 2012 academic year. There was a 97% response rate from this sample.

Descriptive Analysis of Survey Data

Table 2 displays the outcome of descriptive statistics of the variables used in this study. The mean of respondent students' population were 0.707 and 0.293 for male and female, respectively. Student Racial Background had a majority of African which was followed by White and Coloured students while the Indian students are the smallest respondent population. The chi-square result indicates that the difference is significant at $p \leq 0.001$ or 99% probability level. In terms of student family access to an agricultural field for practical learning, the majority of students responded that they had access to an agricultural field for practical learning, while significantly lower percentage (32%)

indicated that they had no access to such land in their respective schools. The chi-square result indicates that the difference is significant at $P \leq 0.05$ or 95% probability level.

In terms of student family monthly income: significantly higher percentage of the total respondent population fell into the income category range of R500 to R2, 000. The average of student family monthly income fell between R2,000 and R5,000; R5,000 to R10,000; and greater than R10, 000 were found to be 0.131, 0.139 and 0.259, respectively. The majority of the student family monthly incomes ranged from R 500 to R5, 000. The chi-

square result indicates that the difference is significant at $p \leq 0.001$ or 99% probability level.

Exposure of learners to farming could depend on whether student families own farm land or not, which in turn might affect student experience levels of, as well as student perceptions about, agriculture. In this study, the results show that the majority of the students' families had no access to farmland. Conversely, student families from the total sample population had access to farmland. The chi-square result indicates that the difference between the categories is significant at $P \leq 0.05$ or 99% probability level.

Table (2): Definition of variables and their descriptive statistics (n = 375)

Variable definition	Symbol	Mean (Std)	χ^2
Female	SEX	0.707(±0.456)	64.1 ⁽¹⁾
Male	SEX	0.293(±0.456)	
Racial Background (African)	RBG 1	0.805(±0.396)	648.7 ⁽¹⁾
Racial Background (White)	RBG 2	0.184(±0.388)	
Racial Background (Coloured)	RBC 1	0.008(±0.089)	
Racial Background (Indian)	RBC 2	0.003(±0.052)	
Family Monthly income R 500-2,000	FMI 1	0.472(±0.500)	113.9 ⁽¹⁾
Family Monthly income R 2,000-5,000	FMI 2	0.131(±0.337)	
Family Monthly income R 5,000-10,000	FMI 3	0.139(±0.346)	
Family Monthly income R 50,00-10,000	FMI 4	0.259(±0.438)	
Mother Educational (No formal education)	MEd 0	0.155(±0.362)	126.4 ⁽¹⁾
Mother Educational level (grade1-9)	MEd 1	0.408(±0.492)	
Mother Educational level (grade10-12)	MEd 2	0.128(±0.334)	
Mother Educational level (Diploma)	MEd 3	0.235(±0.424)	
Mother Educational level (Degree)	MEd 4	0.075(±0.263)	
Home language (isiZulu)	LAN 1	0.765(±0.424)	802.9 ⁽¹⁾
Home language (English)	LAN 2	0.205(±0.405)	
Home language (Sisotho)	LAN 3	0.016(±0.126)	
Home language (Afrikaans)	LAN 4	0.008(±0.089)	
Home language (Xhosa)	LAN 5	0.005(±0.073)	
Visit to other towns /Cosmopltness (Yes)	TV 1	0.875(±0.332)	137.4 ⁽¹⁾
Visit to other towns /Cosmopltness (No)	TV 2	0.125(±0.332)	
Families access to farming land (Yes)	FATL1	0.429(±0.496)	7.5 ⁽²⁾
Families access to farming land (No)	FATL2	0.571(±0.496)	
Discuss with experienced people about AET (yes)	DAA 1	0.784(±0.412)	120.9 ⁽¹⁾
Discuss with experienced people about AET (No)	DAA 2	0.216(±0.412)	

Variable definition	Symbol	Mean (Std)	χ^2
Field for practical learning (Yes)	FFPL 1	0.675(±0.469)	45.7 ⁽¹⁾
Field for practical learning (No)	FFPL 2	0.325(±0.469)	
People live with in students living house	FS	5.747(±2.766)	444.1 ⁽¹⁾

Significant at: (1) = (P ≤ 0.01), and (2) = (P ≤ 0.05)

The averages of Student Mother Education were 0.155, 0.408, 0.128, 0.235 and 0.075 for categories those who had no formal education, grade1-9, grade10-12, Diplomas and Degree, respectively, which has significant differences at P ≤ 0.01 or 99% probability level. The majority 0 of the respondents (78.4%) had opportunities to engage in discussions with others concerning issues related to Agricultural Sciences and education, including its future prospects. However, only 21.6% indicated that they were not involved in any kind of discussions concerning future possible prospects available in any AET areas. The chi-square result indicates that the difference is significant at P ≤ 0.05 or 95% probability level. Student Home language ranged as follows: 76.5% isiZulu, 20.5% English, 1.6% Sesotho, 0.8% Afrikaans and 0.5% Xhosa which is found to be significantly different at P ≤ 0.01 or 99% probability level.

Data collection and analysis

This study was carried out in two stages, using qualitative and quantitative data collection methods. Quantitative data were collected using a pre-tested, structured interview schedule. For the collection of quantitative data (attitude of students towards AET), a structured interview schedule was prepared. Pre-testing of the structured interview schedule was performed before actual data collection, as a preliminary study, in order to check its validity and consistency of the attitude statements and to make refinements. The supplementary qualitative information was collected from both categories of respondents, using an open-ended questionnaire, observation and interviews.

The qualitative data were coded, described and interpreted to supplement the quantitative data. The qualitative data was analysed using a spiral content analysis. The quantitative data was analysed using descriptive statistics, such as frequency, mean and the Tobit model (Henningsen, 2011; Jöreskog, 2002; Niño-Zarazúa, 2012). A Censored Tobit Regression Model

(CTRM) was used to look at the relationship between dependent and independent variables. CTRM statistical analysis, dependent variables is left and right censored (Jöreskog, 2002; Maguire, Jr 2012; Niño-Zarazúa, 2012). The following CTRM general equation was employed in this study:

$$y_i^* = x_i' \beta + \varepsilon_i$$

$$y_i = \begin{cases} a & \text{if } y_i^* \leq a \\ y_i^* & \text{if } a < y_i^* < b \\ b & \text{if } y_i^* \geq b \end{cases}$$

Where:

- a - is the lower limit of the dependent variable
- b- is the upper limit of the dependent variable
- Yi* - is an observed (“latent”) variable
- β - is a vector of unknown parameters
- εi - is a disturbance term
- χi - is a vector of explanatory variable
- i = 1, ..., n (indicate the observation)

Definition of Variables

The magnitude and relationships between variables (dependent and independent) are investigated in this study.

Dependent Variables

Attitude Measurement

In this study, student AET attitudes are treated as the dependent variable. Attitude is the liking or disliking of an object based on what is known about it (Rameela, 2004), which is usually created due to direct exposure to the attitude objects or ideas (Hossain, Robert, Don Gorman, and Jeff, 2010). For the purpose of this study, the focal dependent variable was the attitude of Agricultural Science students towards AET. Attitude is the degree of positive or negative students’ perception of

AET (McIver and Carmines, 1981; Neuman, 2000).

Attitudes were measured by adding the total scores obtained for the attitude statements by attributing a 5 score for ‘strongly agree’, 4 score for ‘agree’, 3 score for ‘undecided’, 2 score for ‘disagree’ and 1 score for ‘strongly disagree’ responses, in the case of positive items. In the case of negative attitude statements the scoring pattern was reversed.

The scale covered various statements which were developed after being reviewed by a panel of experts before the actual data collection, they were pre-tested for relevance. Among the attitude statements, statements with a Corrected Item-Total Correlation less than 0.40 were excluded from the survey (Gliem and Gliem, 2003). The scale was used with multi-item scales and summated

rating scores (Gliem and Gliem, 2003; McIver and Carmines, 1981). Pre-testing was done using Cronbach's alpha. The standardized Cronbach's alpha can be calculated from the following equation:

$$\alpha_{\text{standardized}} = \frac{K\bar{r}}{(1 + (K - 1)\bar{r})}$$

Where:

K = is the number of components (K-items or test lets),
 \bar{r} = the mean of the K (K - 1) / 2.

As shown in Table 1, the Cronbach’s alpha reliability coefficient result was found to be 0.8. A high Cronbach’s alpha means that the reliability coefficient nearer to one indicates that there was good internal consistency of the items in the scale (Gliem and Gliem, 2003).

Table (1) : Descriptive statistics of items used to assess the attitude of students towards farming and agricultural education in South Africa and Cronbach’s alpha (n = 375)

Item	Mean	S.D.	Cronbach's Alpha if Item Deleted
1. I love farming	3.9	1.17	0.75
2. I love studying agriculture science	4.1	1.04	0.76
3. High school AET is important in order to acquire knowledge of agricultural science.	4.4	0.84	0.75
4. The agriculture I am currently studying at high school is not helpful for my future career.	4.5	0.76	0.76
5. I don't like the agriculture science sessions	4.2	1.00	0.77
6. Practical lessons in agriculture science are important with theoretical lesson	4.5	0.83	0.76
7. I plan to apply the agricultural knowledge I am learning to my future career.	3.9	1.09	0.74
8. Studying agriculture is important to secure a public/government job.	3.9	1.12	0.76
Cronbach’s alpha = 0.8			

Independent Variables

The independent variables were selected based on evidence from past research, from published literature, as well as from discussion with experts. Based on these assessments, thirteen different independent variables such as; Home language, Family education, Racial background, Field for practical lessons, Family access to land, Family size, Family monthly income, Discussion about agriculture, Availability of fields for practical learning, Cosmopolitan attitudes, School distance,

Internet access and Computer access were identified and listed for Relevancy Ratings. Relevancy coefficients of the independent variables were selected based on relevancy rating done by a panel of experts. For this procedure, the lists of identified thirteen independent variables were subjected to rating in a four-point continuum. The relevancy coefficients were calculated using the formula:

$$RC = \frac{OS}{PS} 100\%$$

Where:

RC = Relevancy coefficient

OS = Obtained score

PS = Potential score

Those variables with relevancy coefficients (RC) below 50% were excluded from the list. Based on this process, nine independent variables were selected: Home language; Family education; Racial background; Fields for practical learning; Family access to land; Family size; Family monthly income; Discussion about agriculture; and Cosmopolitan attitudes. These were defined as follows:

Home languages of the students included: IsiZulu (1), English (2), Sesotho (3), Afrikaans (4), Xhosa (5). The variable was discrete and expected to have a positive influence on the dependent variable;

Family education referred to the level of formal education of student families (father and mother). These were: No formal education (1); Grade1-9 (2); Grade 10-12 (3); Diploma (4); and Degree (5). The variable was expected to have a positive influence on the dependant variables and was measured as a discrete variable

Racial background referred to the racial backgrounds of the students. The groupings were: African (1), White (2), Coloured (3) and Indian (4). All racial backgrounds were expected to influence the dependent variable positively and was measured as a discrete variable.

Fields for practical learning referred to the availability of a arable land at the school for practical learning. This variable was discrete and expected to have a positive influence on the dependent variable.

Family access to land referred to accessibility to farmland by the student through his family. This variable is discrete and expected to have a positive influence on the dependent variable

Family size was measured as the number of people living with the student in the same household. This variable is continuous and expected to have a positive influence on the dependent variable.

Family income referred to the monthly income earnings of the student's family. The sample was measured as R 500-2,000 (1), R 2,000-5000 (2), R 5,000-10,000 and (3), Above R 10,000. Family monthly income was a discrete variable and was expected to positively

influence the dependant variables.

Discussion about agriculture was operationally defined as the degree to which the respondent engaged in discussion with informed people about the prospects and opportunities in agricultural education training. This was measured as exposed to discussion (1), lack of exposure to informed people and / or information and opportunities in agriculture and agricultural educational training (0). This variable was discrete and was expected to have a positive influence on the dependent variable.

Cosmopolitan attitudes referred to the degree of exposure of the respondents towards social systems outside their own to which they belong (Kaske, 2007). This was measured as: number or lack of visits to agricultural related activities.

Multicollinearity: This is the examination of existing relationships among the independent variables. Multicollinearity exists if the two independent variables are closely related. This makes it difficult for the model to determine which variables have the most influence on the dependent variable (Walker and Maddan, 2008). VIF (variance inflation factor) was used for testing the association among the hypothesized continuous variables. A VIF and tolerance value greater than 10 and 1 are known to have multicollinearity problems among the independent variables (Hamilton, 2009). The VIF (variance inflation factor) was worked out using the formula:

$$VIF(x_i) = \frac{1}{1 - R_i^2}$$

Where, R_i^2 was the squared multiple correlation coefficient between X_i and the other explanatory variables (Maddala, 1992). To test the multicollinearity problem among discrete as well as dummy variables, contingency coefficient tests were also conducted. The contingency coefficient test results were greater than 0.75, indicating the existence of multicollinearity problems between the independent variables. The contingency coefficients were calculated using the formula:

$$C.C = \sqrt{\frac{X^2}{n + X^2}}$$

Where: C.C = Contingence coefficient, n = sample size,

χ^2 =Chi square value (Healy 1984 as cited in Mesfin, 2005). However, the analysed results indicated that there was no multicollinearity problem among the explanatory variables and hence all the hypothesized variables were acceptable; and included in the analysis in the Tobit Regression Model.

Results and Discussion

Table (3): Coefficients obtained as the result of Censored Tobit Regression Model using primary data (n = 375).

Items	Coefficients	Standard Error	t-value	P > t
RBG 1	9.709369	4.469749	2.17	0.030 ⁽¹⁾
RBG 2	8.58487	4.412842	1.95	0.053 ⁽²⁾
RBC 1	11.11341	5.146346	2.16	0.031 ⁽¹⁾
FMI 1	-1.23831	0.680277	-1.82	0.070 ⁽³⁾
FMI 2	-1.426	0.828826	-1.72	0.086 ⁽³⁾
FMI 3	-0.96484	0.795492	-1.21	0.226
MEd 0	0.481143	0.951518	0.51	0.613
MEd 1	-1.19817	0.836571	-1.43	0.153
MEd 2	-1.99539	1.00819	-1.98	0.049 ⁽²⁾
MEd 3	-1.5919	1.002001	-1.59	0.113
FATL 1	0.889455	0.476325	1.87	0.063 ⁽³⁾
LAN 1	-1.91201	3.14679	-0.61	0.544
LAN 2	-3.49729	3.240145	-1.08	0.281
LAN 3	0.113699	3.611909	0.03	0.975
LAN 4	0.471938	4.091612	0.12	0.908
TV 1	-0.39794	0.701287	-0.57	0.571
FFPL 1	0.083182	0.523927	0.16	0.874
DAA 1	2.900388	0.557116	5.21	0.000 ⁽¹⁾
FS	0.208083	0.088083	2.36	0.019 ⁽¹⁾
Cons	24.78177	5.667923	4.37	0.000 ⁽¹⁾
$p \leq 0.0001$ Log likelihood = -1083.6315 Chi-Square of 81.58 (19)				

Significant at: ⁽¹⁾ = (P ≤ 0.01), ⁽²⁾ = (P ≤ 0.05) and ⁽³⁾ = (P ≤ 0.1) probability level

^{ns} = Not significant. **Source:** Authors collection

Racial Background

The estimated coefficient for racial background (RaBG) indicated a positive and significant relationship between student attitude and racial background, such as African (RBG 1), White (RBG 2) and Coloured (RBC 1), as expected. Students’ racial background, such as African, White and Coloured had varied levels of effects on the predicted value of student attitudes to AET (Table 3). This is consistent with the findings of Catsambis

Factors Affecting the Attitude of Students towards AET

Table 3 displays the likelihood ratio. A Chi-Square factor of 81.58 (df = 19) with significance level of P ≤ 0.0001 indicates that the model as a whole fits well and was found to be better than an empty model (i.e. a model with no predictors) with 95% confidence interval.

(2006), Johnson, Crosnoe, and Elder (2001); Catsambis (2006); Catsambis (1994); Mickelson (1990); and Clewell and Anderson (1991). This indicates that the racial background of the students has a positive relationship with the Agricultural Science student attitudes towards AET; and is significant at (P ≤ 0.01) or 99%and (P ≤ 0.05) or 95% probability levels, respectively (Table 3). African, White and Coloured Agricultural Science students have a positive but different

level of attitude towards AET, at different significance levels. This shows that perception differences towards agricultural education and training can be observed across various ethnic and racial groups (African, White and Coloured).

Access to land

Family access to farmland (Access TL) was found to be positive and is statistically significant at $P \leq 0.1$ or 99% probability levels, as expected (Table 3). This implies that students responding affirmatively to family access to farmland have a positive and significant ($P \leq 0.01$) probability level attitude toward AET. A one-unit increase in student family access to farmland is associated with a 0.88 unit increase in the predicted value of student attitudes towards AET (Table 3). The reason for this could be that student family access to farmland, and exposure to and awareness of the practical farming realities could motivate them to seek future careers in this sector. This could motivate them to explore prospects, innovate and practice in agriculture. Family access to farmland could provide opportunities to implement their knowledge for the survival or development of family agricultural activities (Brkić, Tratnik, Bobanac, and Žutinić, 2002; Carreira, Mane, Danforth, and Wailes, 2004) this is consistent in agreement with respondents' responses during informal discussions. In South Africa, the existing unequal land distribution, joblessness and rural poverty coupled with efficient commercial agriculture is the reality (Lahiff and Cousins 2005). Availability of family access to farmland has a significant effect on Agricultural Science student attitudes towards AET and Agricultural Science knowledge. Positive attitudes could be created due to student family access to farmland. Similarly, it is known that learning is easier when the context is familiar; thus students with family access to land may find it easier to study Agricultural Science; as argued by Sing (2011:4) "context familiarity had positive effects on students' levels of inference-making, their self-reported (sic) levels of motivation, and perceived levels of difficulty". Positive student attitudes motivate students to seek further knowledge in agriculture; and may lead them to study Agricultural Sciences at a high level of education. Therefore, student family access to farmland has been found to be a motivator for positive Agricultural Science student

attitudes towards AET.

Discussion about Agriculture

Discussion about agriculture refers to the students' opportunities to discuss what they are learning in a wider context, including agriculture as a career choice. Discussion can be developed by initiating and engaging students in discussions related to various Agricultural Science areas. The relationship between students' discussions about agriculture and students' attitudes to AET was investigated and presented in Table 3. Student attitudes to AET may be dependent on the amount of student awareness about agriculture and its prospects. The results show that a one unit increase in involvement in discussions concerning Agricultural Science and its future educational and job prospects was associated with a 2.9 unit increase in the predicted value of student attitudes to AET. Students who have opportunities and access to discussions about AET, job prospects and opportunities in agriculture have positive attitudes to the Agricultural Sciences. The effect is found to be positive and significant at $P \leq 0.01$ probability levels, as expected, (Table 3). This result is found to be consistent with the findings of Israel, Beaulieu, and Hartless (2001) and Kilpatrick (2000). Thus, student interactions and sharing of information with an experienced person can assist students develop a favorable disposition towards AET (Ayanda *et al.* 2012). Greater awareness and engagement in discussions about agriculture result in improved student attitudes toward AET. Sufficient discussions and information on job and career opportunities in agriculture could, therefore, contribute to more positive student attitudes to AET.

Family education

For a one-unit increase in the education of the student mother who had completed high school has a decreasing order by 1.99 units in the predicted value of student attitudes to AET. This trend was found to be negative and significant at $P \leq 0.05$ or 95% probability level (Table 3). As the mother's education increases, the attitude of the scholar towards Agriculture as a career option decline. This indicates that education changes people's priorities and options.

A similar study by Schiefele (1999); Davis-Kean (2005); Udoukpong, Emah, and Umoren (2012) and Davis-Kean (2005) reported that parental beliefs and

behaviours have a positive effect on student attitudes in school, their academic interests and performance. This is because parental awareness and interest plays a major role in the activities students choose to pursue, both in and out of school. Parental attitudes toward subjects in education have a significant effect on student achievement and attitudes (Hedjazi and Omidi, 2008). Thus the parents' attitudes toward agricultural studies or Agricultural Sciences will affect student perceptions and attitudes. This is important because parents guide their children in terms of study and career choices.

Family Size

The results indicate that student attitudes to AET positively correlate with student family size (Table 3). A one unit increase in the number of people living in the student family is associated with a 0.20 unit increase in the predicted value of the student attitudes to AET. This means that the increase in number of students' family correlates positively with the positive perception of learners attitude towards Agricultural Education and Training. This trend was found to be significant at $P \leq 0.01$ or 99% probability level probability level; the larger the family, the more positive the student is likely to be toward agriculture. When the family size increases, siblings are unlikely to receive equal shares of parental resources, attention to and perceptions of study areas (Booth and Kee, 2009). Therefore, large family size could be a possible source for the composition of diverse AET experiences and information, possibly creating opportunities to share AET experiences and information among family members. The larger the family, the more positive the student attitude is likely to be to agriculture.

Family Monthly Income

Family monthly income of between R 500-5,000 has a negative decreasing effect on the student attitudes towards AET. The effect is significant at $P \leq 0.01$ or 99% probability level (Table 3). This shows that students from families with less than R5,000 as a monthly income have a negative attitude towards AET. A one unit increase in the family monthly income in the range of R500-2,000 and R2,000-5,000 are associated with a 1.23 and 1.42 unit decrease, respectively, in the predicted value of student attitudes to AET (Table 3). Family income has an effect on future student achievement by creating motives and developing positive attitudes to

Agricultural Science studies. Davis-Kean (2005) and Acemoglu and Pischke (2001) explain an existing relationship between student achievement in studies and family income. As with any human aspiration, students aspire to a future attractive income. Student perceptions about study options and future careers will be influenced by their knowledge of the marketability of agriculture and by their current level of family income. Students from low monthly-income families are more strongly guided by their parents to compensate for their financial conditions, by selecting a study area other than agriculture, with what they perceive to be better job opportunities and better pay. The result indicated that if a student family is poor, they will steer their children out of agriculture. The reason for this could be attributed to the fact that that agriculture requires natural resources such as land and initial investments that may not be affordable to low income parents.

Conclusion and remarks

The results showed that family size, racial background and discussions with other people about AET have a positive and significant at ($P \leq 0.01$) probability level, respectively, and affect student attitudes towards AET. Furthermore, family access to farmland has a positive and significant at ($P \leq 0.1$) or 90% probability level effect on the student attitudes towards AET. The student with educated mother, i.e. at high school level has a negative and significant effect at ($P \leq 0.05$) or 95% probability level respectively, on student attitudes to AET. Also student family monthly-income between R500-5,000 has a negative and significant effect at ($P \leq 0.01$) or 99% probability level on student attitudes toward AET.

The result also showed that of nine independent variables in the model used to identify influences on Agricultural Science student attitudes to AET, at least six were found to be statistically significant, with the probability of influencing student attitudes to AET at high school. Family size, racial background: such as African (RBG 1), White (RBG 2) and Coloured (RBC 1), access to land and discussions about agriculture have a positive and significant effect on student attitudes to AET. Variables, such as family education and family monthly income, however have a negative and significant influence on student attitudes to AET.

The findings suggest that the various bodies responsible for the governance of AET, conscious of the factors that influence student attitudes toward AET, will need to use various innovative strategies to create community and student awareness of agriculture, its importance and its potential as a line of study and future career. This could contribute to more positive attitudes

toward and an understanding of the importance of AET.

It is also recommended that responsible parties (e.g. the provincial Department of Education) should make every effort to ensure that every high school that offers Agricultural Science has land for practical learning. A more positive attitude toward AET and access to land for practical learning will contribute to student performance.

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العوامل المؤثرة على تصورات طلاب العلوم الزراعية نحو التدريب التربوي الزراعي

تسيون كيدان، ستيفين وورث*

ملخص

أجريت هذه الدراسة لتقييم العوامل التي تؤثر في سلوك طلاب مدرسة العلوم الزراعية للتعليم الزراعي والتدريب بمقاطعة كوازولو ناتال في جنوب أفريقيا. وقد تم تحديد العوامل الإيجابية والسلبية التي تؤثر في سلوك هؤلاء الطلاب ولمعرفة تأثير التدخلات السياسية أخذت العينة من مجموع 375 تلميذاً من المدارس الثانوية المختارة وذلك باستخدام تصميم بحثي لعينات متداخلة، متزامنة ومختلطة؛ وذلك باستخدام كل من نظامي الاستبيانات المركب وغير المركب. الخلفية العرقية، حجم الأسرة، والوصول إلى الأراضي الزراعية الأسرة وحق دخول الأسرة الى ارض المزرعة والنقاشات بين التعليم الزراعي والتدريب مع الآخرين كان له أثر إيجابي وكبير على سلوك الطالب. دخل كل من اسر الطلاب الشهري يتراوح بين 500-5000 راند والأم التي اكملت دراستها الثانوية لها تأثير معنوي سلبى وكبير على سلوكيات الطالب. ويتم تشجيع الجهات المسؤولة على خلق طريقة بالسماح للأسر بالدخول للاراضي الزراعية في المناطق الحضرية وشبه الحضرية وخلق دخل اخر للفرد وايجاد فرص عمل زراعية اخري لتحسين دخل الاسرة الشهري. الدخل الأخرى، وفرص الأعمال.

الكلمات الدالة: السلوك، التعليم، المدرسة الثانوية، جنوب أفريقيا، طالب، التدريب.

* University of KwaZulu-Natal.

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