ELECTRICITY CONSERVATION AND SAFETY AWARENESS AMONG SENIOR HIGH SCHOOL STUDENTS

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Abstract*:* Awareness of conservation and safety issues regarding electrical energy use among students is critical. This study has determined the level of electricity conservation and safety awareness among senior high school students in the Ashanti Region of Ghana. The study was carried out through the administration of questionnaires to eight hundred and eighty-three students in five selected schools in the study region. The study assessed awareness levels based on gender, programme of study and academic study level. The questionnaires were developed to establish student's knowledge of specific energy conservation practices relating to various consumer appliances, their motivation or otherwise to support institutional efforts to reduce energy consumption as well as their awareness of specific issues regarding electric shocks and electric fires. Analysis of the administered questionnaires point to the fact that a very high percentage of the students in all the three categories considered are aware of most of the issues presented to them. Also, a high percentage of them are inclined towards factors that motivate energy savings. Of the categories evaluated, females, students in the first level of study, and those studying Home Economics had the highest average awareness levels. The findings of this study will be very useful for educational campaigns concerning electricity use.

1. INTRODUCTION

Electric energy is of much importance to the world. Notwithstanding the huge benefits of electric energy, the lack of adherence to basic rules associated with electricity use has caused many adverse effects including electric shocks and electric fires. Additionally, inefficient use of electric energy has dire financial consequences. Therefore, electrical energy

conservation and electric safety awareness is of utmost importance in all areas of electricity usage; be it residential, educational, commercial or industrial. Educational institutions are of great concern when it comes to safe and efficient utilization of electricity because they bring together hundreds and thousands of individuals from diverse backgrounds [1]. The lack of awareness of energy saving measures and electrical safety amongst students can spell doom for educational institutions.

Efficient lighting control through behavioural change, including the use of efficient daylighting strategies alone, has the potential of reducing electrical energy consumption of educational institutions by up to 30% [2]. On a wider scale, energy efficiency and conservation awareness in schools can curb the need for expanded generation capacity. Moreover, electrical safety awareness among students would help to reduce the hazards due to electric shocks and electric fires. It is reported that most of the fire outbreaks in schools occur due to the misuse of electricity by students [3]. Students are found of engaging in unsafe activities such as overloading extension cables, using frayed cables or exposed conductors and connecting appliance cables directly to sockets without using plugs [4].

The issues highlighted above necessitate awareness of the right use of electric energy among students [5]. Of importance in this awareness drive are students in the second cycle institutions. This is partly because of their inexperience and the fact that several of them are housed in one dormitory. Furthermore, in developing countries with high illiteracy levels, many young students may be the only literates in their families. Therefore, their acquisition of sound knowledge in electric energy utilization will go a long way towards the enlightenment of their families in efficient and safe electric energy use. The more knowledgeable people are, the more interested they are in adopting energy saving practices and in participating in energy saving policies and programmes [6].

Efforts toward educating young students are bound to fail if they are not based on knowledge of their current levels of awareness of energy conservation and electric safety issues. Knowledge of their level of awareness will determine the issues to stress on as well as the overall approach to use. Thus, there is the need for research into the electric energy conservation and electric safety perspective of students in secondary schools. Most published journal articles about electric energy awareness among secondary school students have focused on awareness on renewable energy sources [7]. Only few research works have been published in electric energy efficiency, electric energy conservation, and electric safety awareness among students of secondary schools. The prominent work amongst the few is the work presented in [5]. The work in [5] determined the level of awareness of secondary school students in the Aegean region of Turkey with regards to renewable energy sources and energy saving. The study concluded that the 400 hundred students interviewed had a high level of awareness about renewable energy sources and energy saving. The study however failed to evaluate the levels of awareness of the students on specific energy saving activities, which is critical for any education. Furthermore, electric safety issues were not considered.

This study therefore sought to address this knowledge gap. It among others determined the level of awareness of secondary school students about electric safety, energy efficiency and specific energy saving activities. The study was conducted by administering questionnaires to senior high school (formally called senior secondary school) students in the Ashanti Region of Ghana. The questionnaires asked various questions that required students to indicate their knowledge of specific energy efficiency and energy conservation measures related to various consumer loads. Their current level of engagement in energy conservation was also determined. Their willingness to engage in energy savings was also assessed. The reasons for their willingness or the lack of it was also determined. Again, their knowledge about electric safety was established. The findings presented will inform the specific issues to place greater emphasis on when educating students in secondary schools about safe and effective use of electricity, to ensure desired outcomes.

2. METHODOLOGY

The study was done by administering questionnaires to the target group. The target group was senior high school students in the Ashanti Region of Ghana. Schools in the Ashanti Region admit students from diverse social, ethnic, cultural, religious and economic backgrounds. The questions were administered to students in five senior high schools. One of the schools admits only male students, one admits only female students while the remaining three are mixed schools. The questionnaires were distributed to eight hundred and eighty-three (883) students, in a controlled environment (that is in their classrooms). This ensured that all distributed questionnaires were completed and returned. The administration of the questionnaires was largely supervised by the teachers of the schools. Explanations were offered to students who had difficulty understanding any of the questions asked. In all, four hundred and sixty-one (461) males and four hundred and twenty-two (422) females participated in the survey. The questionnaires were carefully distributed to capture students studying various programmes and at different study levels. The programmes covered were Business, General Arts, Home Economics, Science and Visual Arts. Senior High Schools in Ghana have three study levels namely, SHS1, SHS2 and SHS3. SHS3 is the highest level. The study covered male and female students studying the various programmes at all the different levels. Table 1 shows details of the socio-demographic characteristics of students that were involved in the study.

The questionnaires were designed to draw the following information from the students: (i) their energy efficiency awareness about various consumer loads including lighting, electronic devices, heating appliances and refrigerators (ii) their knowledge and application of appliance ratings and energy efficiency labels, (iii) their current engagement in energy saving practices, (iv) their motivation or otherwise to embark on energy conservation,

(v) their awareness of the causes of electric shocks and electric fires, and (vi) their knowledge of preventive measures against electric shocks and electric fires. Before the mass distribution of the questionnaires, a pretest was done in one of the schools to ascertain the suitability, reliability and validity of the questionnaires.

Table 1. Socio-demographic characteristics of students

		Number	*Percentage(%)*
Gender	Male	461	52.2
	Female	422	47.8
Programme	Business	148	16.8
	General Arts	285	32.3
	Home economics	161	18.2
	Science	180	20.4
	Visual Arts	109	12.3
Level	SHS1	235	26.6
	SHS2	365	41.3
	SHS3	283	32.0

3. RESULTS AND ANALYSIS

The analysis of the collected data was done using the Statistical Package for Social Sciences (SPSS) software. The descriptive statistics model in SPSS was employed to summarize the data into figures, tables and charts. It is worth noting that a few of the questions were not answered by some of the students. For example, whereas all 283 SHS3 students answered the question relating to their awareness of energy saving by not overloading refrigerators, a slightly reduced number of 281 gave responses to knowledge of the fact that allowing hot food to cool before putting them in refrigerators saves energy. The reason for this is unknown since it was not possible to identify and interview the students who did not answer those questions. The sub-sections that follow discusses the results obtained.

3.1. Energy efficiency awareness in the use of refrigerators

It was determined whether the students knew that energy will be saved if the following are done: refrigerators are not overloaded, foods are made to cool before being put in refrigerators, refrigerator doors are kept closed, adequate ventilation is provided around refrigerators to facilitate heat transfer, and freezer compartments are regularly defrosted.

Figure 1 summarizes the levels of awareness of students based on gender. Three hundred and eighty-five males representing 84.5% of the male respondents indicated awareness of the fact that energy is saved by not overloading refrigerators. For the females, 84.6% knew that energy is saved when refrigerators are not overloaded. With regards to the issue of allowing hot food to cool before being put in refrigerators, 86.1% of the males indicated awareness of this while a higher percentage of 93.1% of the females indicated knowledge of this fact. Nearly ninety-four percent (93.7%) of the males indicated knowledge of the fact that keeping refrigerator doors closed save energy while 97.6% of their female counterparts also indicated awareness of this. A rather low percentage of 66.2% of the males knew that, to conserve energy, adequate ventilation must be provided around refrigerators. Similarly, 63.0% of the females had knowledge of this fact. Lastly, only 56.4% of the males knew that defrosting freezer compartments regularly lead to energy saving while a higher percentage of 62.6% of the females knew this. Both male and female students showed very high levels of awareness in saving energy by not overloading refrigerators and not putting hot foods in them. However, the same cannot be said of their levels of awareness when it comes to positioning refrigerators and defrosting freezers to reduce electricity consumption. Their levels of awareness in these latter areas are relatively low. Averagely, the female students have higher level of awareness than their male counterparts.

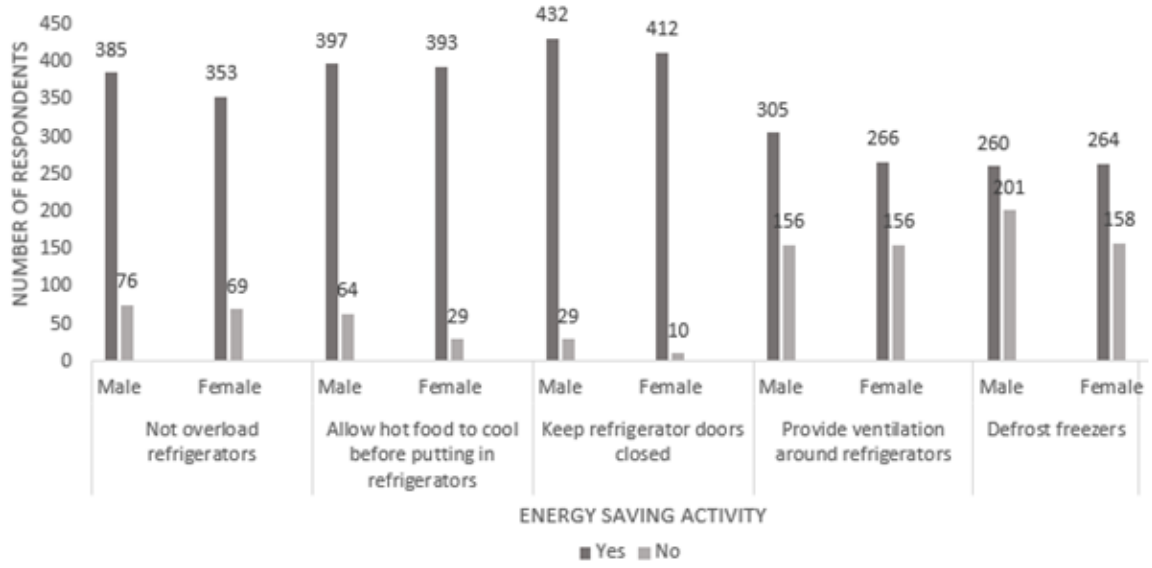

Fig. 1: Awareness in the use of refrigerators based on gender

Figure 2 shows the awareness levels for energy saving issues regarding the use of refrigerators, based on the study levels. The percentages of SHS1, SHS2 and SHS3 students who knew that energy is saved when refrigerators are not overloaded are 91.1%, 80.5% and 81.3% respectively. With regards to awareness of the fact that allowing hot foods to cool before putting them in refrigerators is energy saving, the percentages that answered in the affirmative are 89.4%, 91.0% and 88.3% for SHS1, SHS2 and SHS3 respectively. In terms of

energy saving awareness relating to keeping refrigerator doors closed, 95.3% of SHS1 students, 95.1% of SHS2 students and 96.5% of SHS3 answered yes. The percentages relating to providing enough ventilation around refrigerators to save energy are 69.6%, 61.9% and 64% for SHS1, SHS2 and SHS3 respectively. Pertaining to energy saving due to defrosting freezer compartments, the percentages which indicated awareness are 67.2% for SHS1, 55.3% for SHS2 and 59.6% for SHS3. All study levels demonstrated very high degrees of awareness in the areas assessed except having to provide enough ventilation around refrigerators and defrosting freezes to save energy. Contrary to expectation, the SHS1 students had averagely higher degree of awareness than all other levels. This may be due to some education they had at Junior High School level or during freshmen orientation sessions at the Senior High Schools. Whatever the reason may be, this goes to show that early education yields positive outcomes.

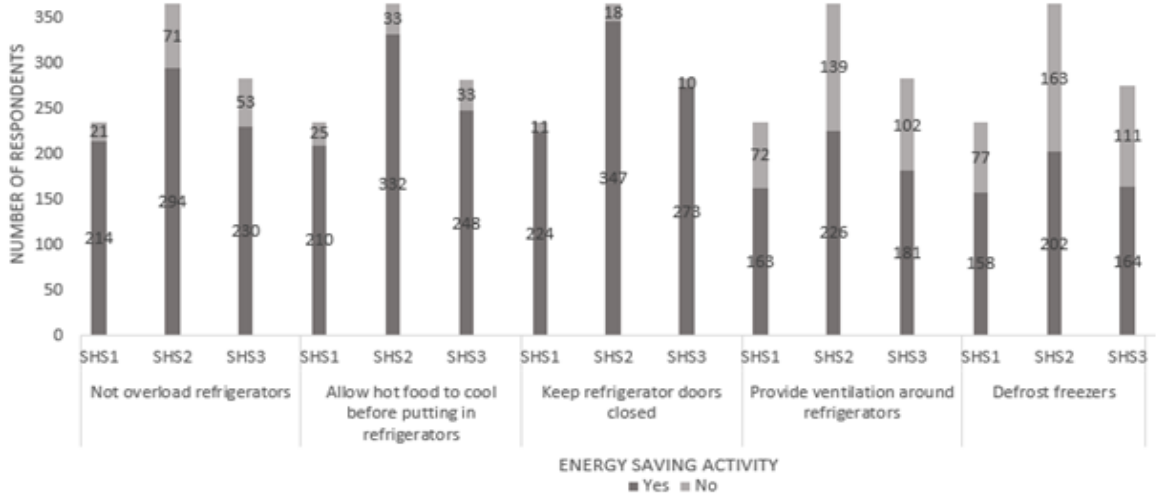

Fig. 2: Awareness in the use of refrigerators based on study level

Figure 3 summarizes the level of awareness of students, based on programme of study. Of the 148 students in the Business programme who gave responses as to whether they were aware that energy is saved when refrigerators are not overloaded, 88.5% indicated awareness. For the same question, the percentages of those who responded in the affirmative for the General Arts, Home Economics, Science and Visual Arts programmes are 78.9%, 87.2%, 83.3% and 86.1% respectively. Regarding knowledge of the fact that allowing hot food to cool before putting them in refrigerators save energy, the percentages that indicated knowledge of this are 82.4% for students studying Business, 91.9% for students studying General Arts, 94.4% for students studying Home Economics, 88.3% for students studying Science and 87.2% for students studying Visual Arts. Almost 97% of the Business students knew that keeping refrigerator doors closed saved energy. Likewise, 95.1% of the General Arts students are aware that keeping refrigerator doors closed is energy saving. The percentages for the other programmes are 96.2%, 97.8 and 91.7% for Home Economics,

Science and Visual Arts respectively. The percentages of Business, General Arts, Home Economics, Science and Visual Arts students who specified awareness of the fact that adequate ventilation must be provided around refrigerators for them to consume less energy are 59.4%, 64.1%, 67.7%, 62.6% and 75.9% respectively. With regards to defrosting freezers to conserve energy, the percentage affirmative responses are 57.0%, 55.7%, 66.5%, 59.8% and 69.4% for Business, General Arts, Home Economics, Science and Visual Arts programmes respectively. The Home Economics students showed the highest average awareness.

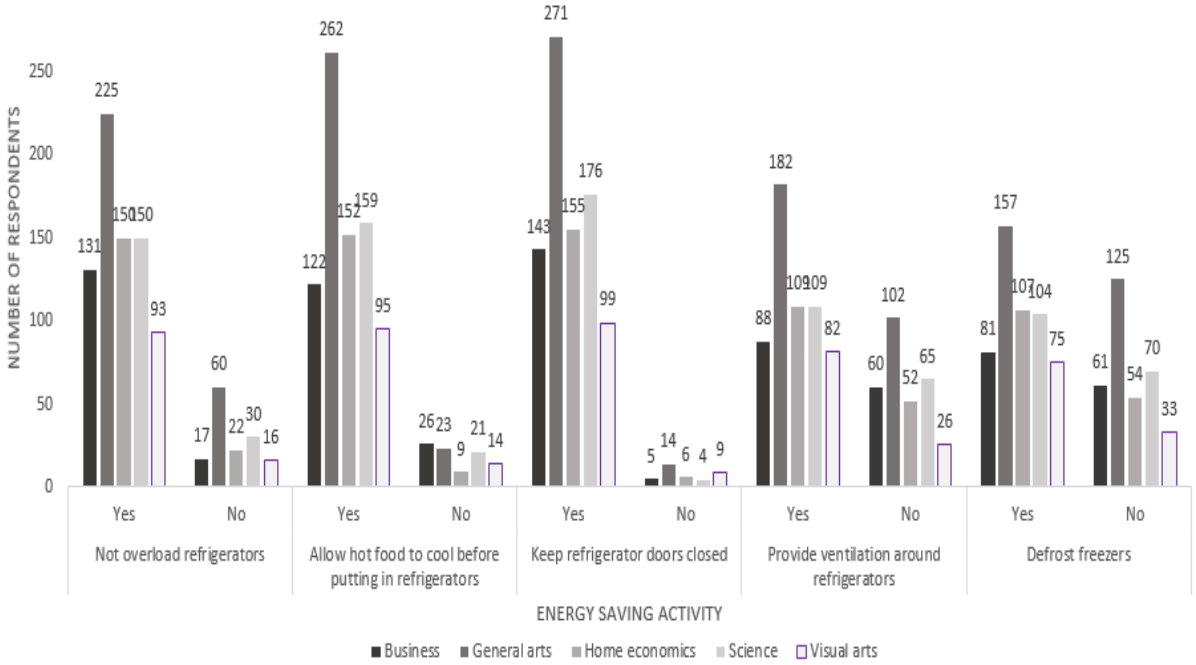

Fig. 3: Awareness in the use of refrigerators based on programme of study

3.2. Energy saving awareness relating to heating loads

Here, students were asked to indicate whether they knew that engaging in the following activities save energy: (i) heating only the required amount of water instead of always filling the kettle, (ii) bathing with cold water instead of warm water where possible, and (iii) ironing clothes in bulk, say over the weekend, instead of ironing daily.

Figure 4 provides details of responses received, based on gender. Approximately 81% of the male students knew that heating only the required amount of water would save energy. For the females, the percentage awareness was 88.6%. Thus, more females than males are aware of this. With regards to bathing with cold water instead of warm water to save energy, the percentage awareness was 64.2% of males and 64.0% of females. In terms of ironing in bulk instead of in bits, the percentages that indicated awareness are 83.1% and 91.0% of

males and females respectively. Here too, the females demonstrated greater awareness than their male counterparts.

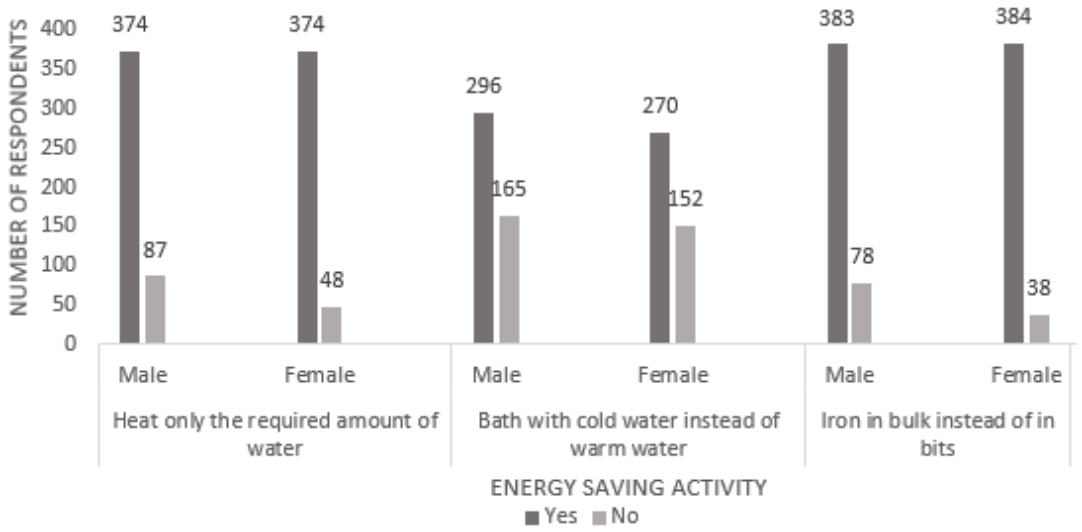

Fig. 4: Awareness in the use of heating loads based on gender

Shown in *figure 5* are the responses, in terms of study level. The percentages for knowing that heating only the required amount of water saves energy are 85.1% for SHS1, 83.8% for SHS2 and 85.5% for SHS3. For energy saving by bathing with cold water instead of heated water, the percentages are 63.4%, 67.7% and 60.1% for SHS1, SHS2 and SHS3 respectively. Lastly, 88.9% of SHS1 students, 83.3% of SHS2 students and 89.8% of SHS three students knew that bulk ironing is energy conserving. Again, the SHS1 students had the highest average percentage awareness.

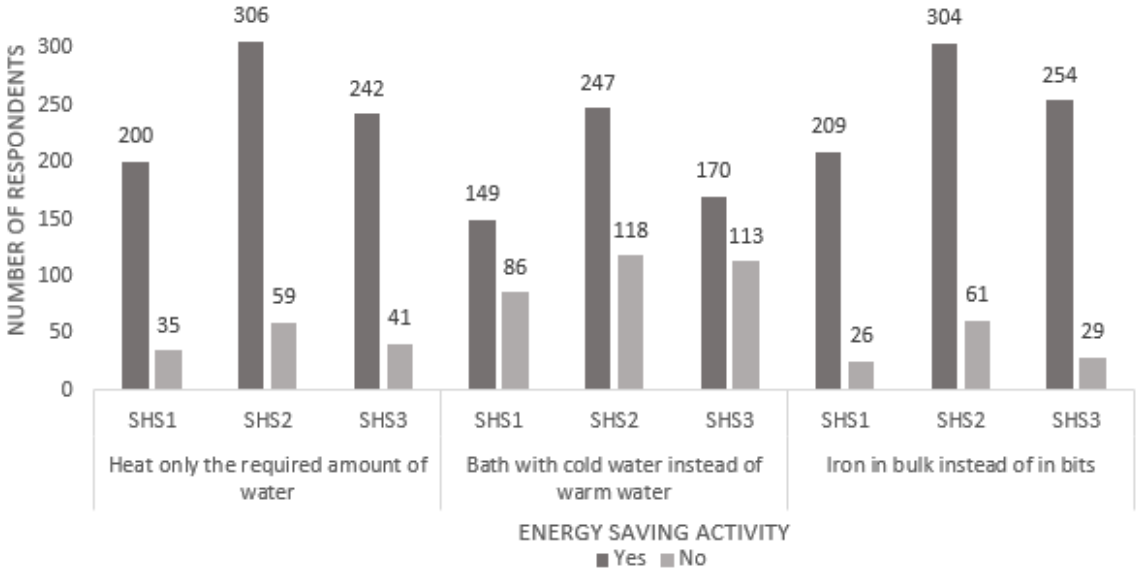

Fig. 5: Awareness in the use of heating loads based on study level

Figure 6 captures the responses, in terms of programme of study. The percentages for knowing that heating only the required amount of water saves energy are 75.0% for Business students, 87.4% for General Arts students, 87.6% for Home Economics students, 87.8% for Science and 81.7% for Visual Arts students. For energy saving by bathing with cold water instead of heated water, the percentages are 56.1%, 69.5% and 57.1%, 65.6%, and 68.8% for students studying Business, General Arts, Home Economics, Science and Visual Arts respectively. Lastly, 86.5% of students studying Business, 84.2% of students studying General Arts, 92.5% of students studying Home Economics, 90.6% of students studying Science, and 79.8% of students studying Visual Arts knew that bulk ironing is energy saving. In terms of awareness in energy saving associated with heating loads, the General Arts student had the highest average level of awareness.

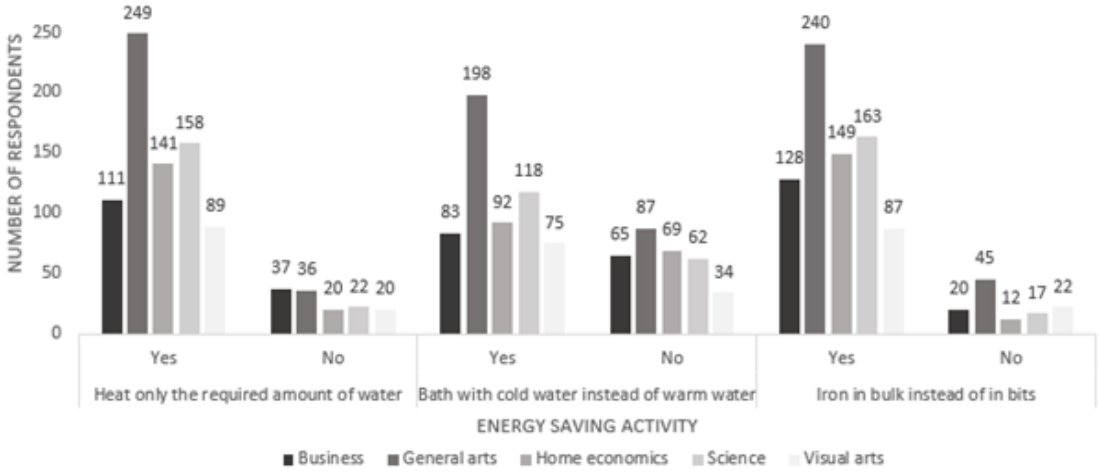

Figure 6. Energy efficiency awareness among programme of study in the use of heating loads

3.3. Energy efficiency awareness relating to the use of electronic devices

Here, it was determined whether the students knew that switching off electronic appliances at the sockets, when they are not in use is an energy conservation measure. It was also found out if they were aware that not keeping computers on standby but rather shutting them down helps to save energy.

Figure 7 shows the responses received, based on gender. Almost 93% of the males indicated knowledge of the fact that switching off electronic appliances at the socket help save energy. A higher percentage (97.2%) of the females knew this. With regards to saving energy by not keeping computers on standby, the percentages are 78.5% for males and 82.9% for females. Here too, the females showed greater awareness.

Figure 8 also shows, based on study level, the responses received for the same questions. With regards to saving energy by switching off appliances at the sockets, SHS2 students demonstrated slightly higher level of awareness than the rest with a percentage of 95.9%. The percentages for SHS1 and SHS3 are 95.7% and 92.5% respectively. Pertaining to

not keeping computers on standby, the percentages of students who answered in the positive are 82.9%, 81.6% and 80.9% for SHS1, SHS2 and SHS3 respectively. Thus, the SHS1 students showed greatest average awareness in the issues assessed.

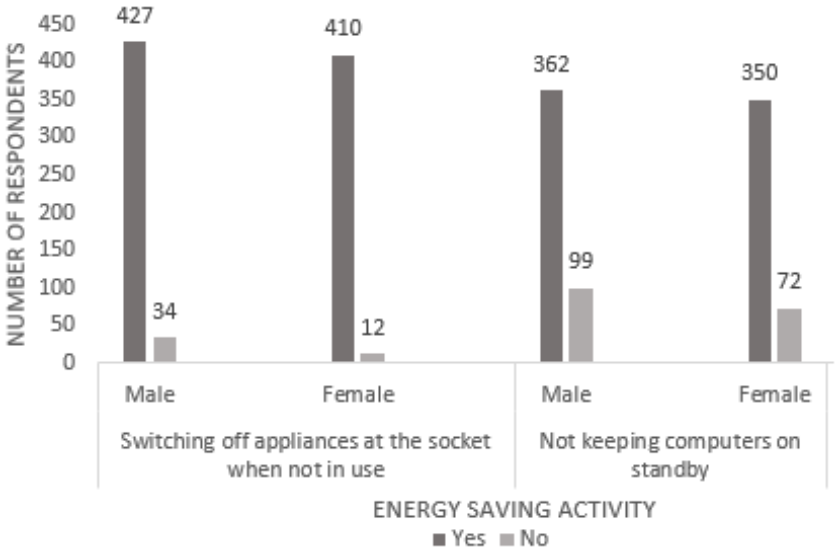

Fig. 7: Awareness in the use of electronic loads, based gender

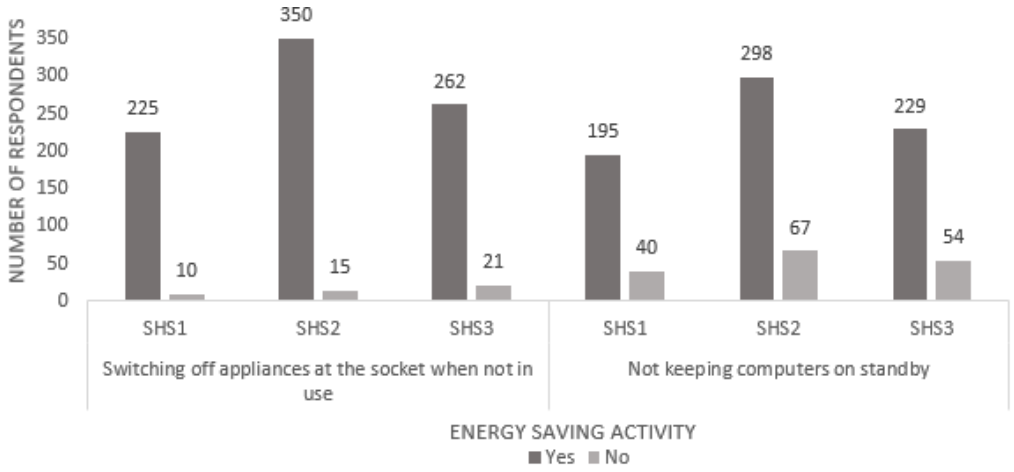

Fig. 8: Awareness in the use of electronic loads, based on study level

Figure 9 highlights the knowledge levels about the energy saving activities, based on the programme of study. Here, 91.9% of Business students, 95.8% of General Arts students, 97.5% of Home Economics students, 96.7% of Science students and 89.0% of visual Arts students knew that switching off electronic appliances at the sockets conserves energy. The percentages who indicated awareness of the fact that not keeping computers on standby saves energy are: 75.7%, 80.7%, 87.0%, 87.0% and 73.4% for students studying Business, General Arts, Home Economics, Science and Visual Arts respectively. The results suggest that most students have knowledge of the issues asked, with the Home Economics students showing the highest average awareness.

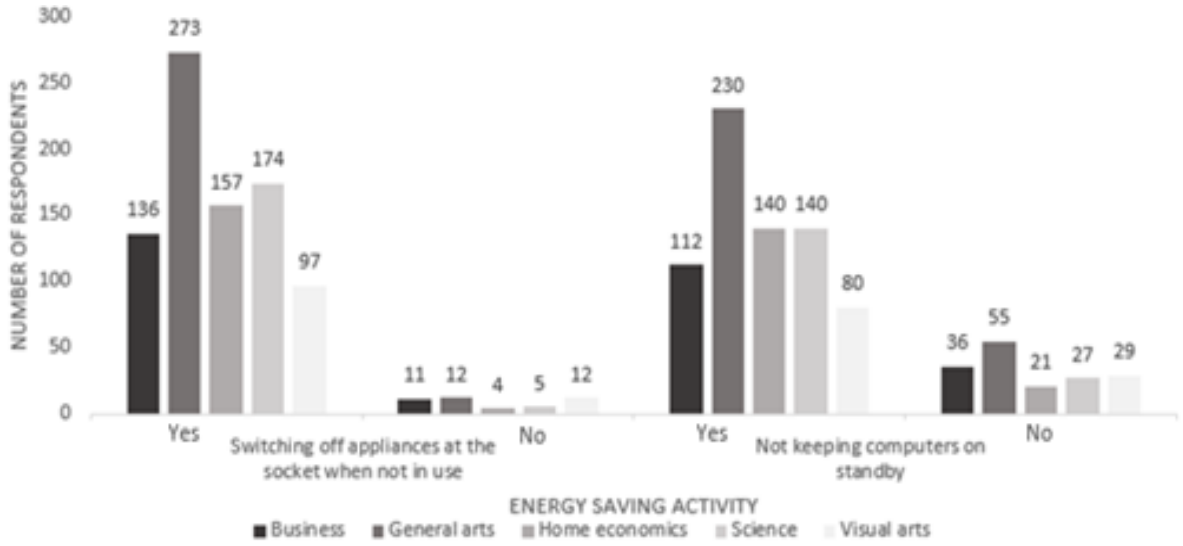

Fig. 9 Awareness in the use of electronic loads, based on programme of study

3.4. Energy efficiency awareness in the use of lighting

As shown in *figure 10*, most male and female students know that putting light bulbs off when there is adequate natural light will help save energy. The specific percentages are 91.1% and 96.2% for males and females respectively. Again, the females showed greater awareness.

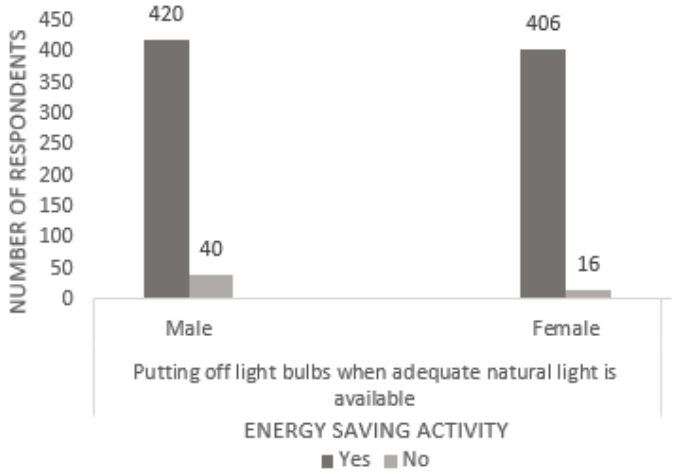

Fig. 10: Awareness in the use of natural lighting to save energy, based on gender

In terms of study levels, 90.6% of SHS1 students, 93.7% of SHS2 students and 95.4% of SHS3 students knew that switching off light bulbs when not needed saves energy, as shown in *figure 11*. The level of awareness is very high among all study levels, with SHS3 students having the highest level.

The percentage levels of awareness based on programme of study were found to be 92.6%, 93.3%, 82.6%, 97.2% and 87.2% for Business, General Arts, Home Economics, Science and Visual Arts programmes respectively. *Figure 12* highlights this. Here, the Science students showed the highest level of awareness.

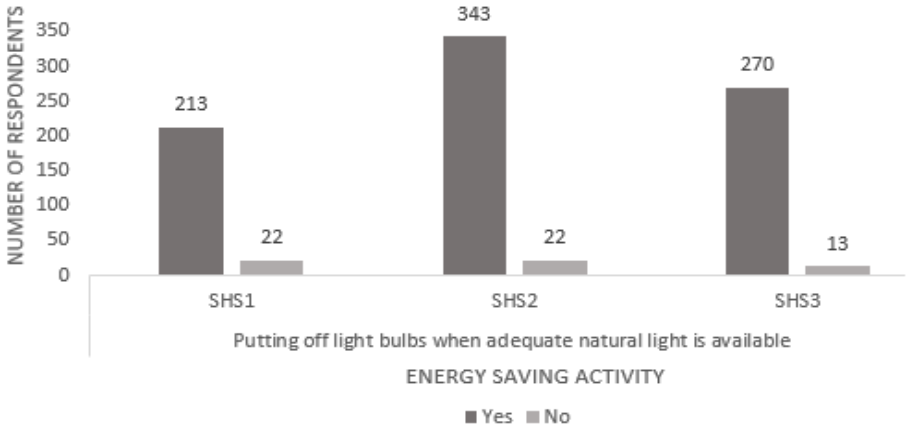

Fig. 11: Awareness in the use of natural lighting to save energy based on study level

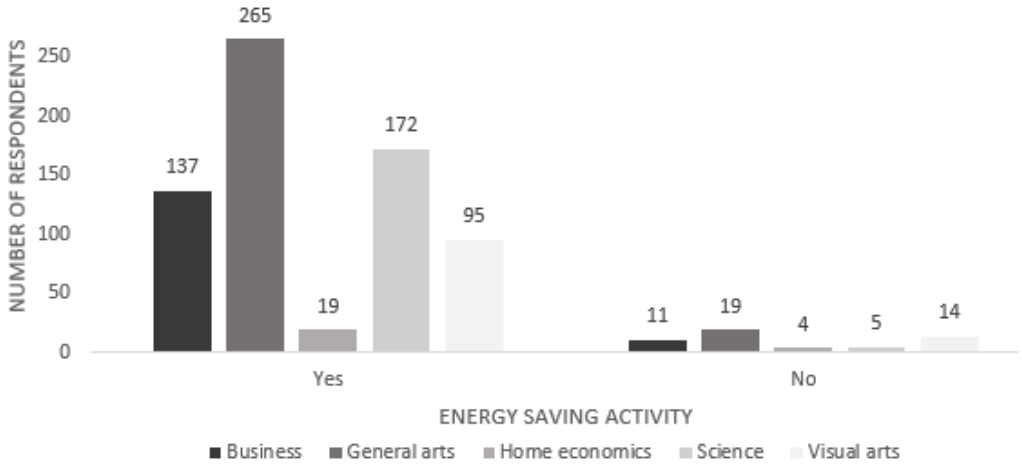

Fig. 12: Awareness in the use of natural lighting to save energy based on programme of study

3.5. Knowledge and practice of energy efficiency in the purchase of consumer items

Here, the basis for the students buying or encouraging their parents or friends to buy various consumer items was determined. It was determined whether the students (i) knew that light emitting diode (LED) bulbs use less energy than compact fluorescent lamps (CFLs), (ii) buy LED bulbs instead of CFLs, (iii) check the energy consumption of appliances before purchase, (iv) buy appliances that have the highest number of energy stars, and (v) buy new refrigerators instead of used ones. In Ghana, energy star labels are embossed on various appliances to indicate their efficiencies. The more the stars in a label on an appliance, the higher its efficiency. Also, there is a government policy that discourages the purchase of used refrigeratiors. Table 2 shows the percentages of respondents that answered in the affirmative. In Table 2, NR is the number of respondents.

Both gender showed high level of knowledge and practice in the areas assessed, except buying appliances with the highest number of energy stars. The male students showed greater knowledge and practice with regards to knowing that LED bulbs use less energy than CFLs, buying LED bulbs instead of CFLs, buying new refrigerators instead of used ones and

checking the energy consumption of appliances before purchase. On the other hand, the females showed greater awareness in buying appliances that have energy star labels as well as buying those with the highest number of energy stars. Averagely, the females had the highest level of awareness. Based on study levels, SHS1 students had the highest average awareness for the areas assessed. In terms of programme of study, Home Economics students showed that highest average awareness

Table 2: Knowledge and practice of energy efficiency in purchase of consumer items

	NR	*Know that LED bulbs use less energy than CFLs*	*Buy LED bulbs instead of CFLs*	*Check energy consumption of appliances before purchase*	*Buy appliances that have the highest number of energy stars*	*Buy new refrigerators instead of used ones*
		Yes(%)	Yes(%)	Yes(%)	Yes(%)	Yes(%)
Male	461	70.3	76.1	82.4	56.2	83.7
Female	422	69.0	70.1	81.8	57.1	82.2
SHS1	235	68.5	74.5	83.8	64.3	83.4
SHS2	365	69.0	72.1	83.0	52.1	81.9
SHS3	283	71.4	73.9	79.5	56.2	84.1
Business	148	68.9	70.9	73.6	51.4	79.7
General Arts	285	67.7	71.2	83.2	55.1	86.7
Home Econ.	161	72.0	79.5	88.8	68.9	82.0
Science	180	67.8	71.7	84.4	53.9	80.6
Visual Arts	109	75.2	75.2	77.1	54.1	83.5

3.6. Engagement in energy saving activities

The motivation for students to help their schools to save energy was determined. The motivations provided for students to select from are: (i) to reduce bill payments, (ii) to reduce the demand on the national grid, (iii) to protect the environment, and (iv) it is the right thing to do. Students could select multiple reasons.

The percentages of students who selected the various factors are presented in Table 3. It is observed from Table 3 that majority of each of the groupings considered are poised to support energy saving efforts. Here, the males showed higher degree of motivation. In terms of study level, the SHS1 students showed the highest average degree of motivation. Based on programme of study, students of the Visual Arts programme had the highest average level of motivation.

Table 3: Motivation for students to engage in energy saving activities

	NR	*To reduce bill payment*	*To reduce the demand on the national grid*	*To protect the environment*	*It is the right thing to do*
		Yes(%)	Yes(%)	Yes(%)	Yes(%)
Male	461	96.1	73.3	76.4	86.1
Female	422	93.4	64.7	73.7	87.9
SHS1	235	91.5	77.4	74.9	90.2
SHS2	365	94.0	65.2	75.9	87.7
SHS3	283	98.6	67.5	74.2	83.4
Business	148	91.2	63.5	71.6	85.1
General Arts	285	95.1	62.5	73.7	87.4
Home Econ.	161	97.5	78.9	78.9	88.8
Science	180	93.3	67.8	70.0	84.4
Visual Arts	109	97.2	82.6	86.2	89.9

The reasons why they would not support energy saving efforts was also determined. The factors provided for them to select from were: (i) I do not pay the bill, (ii) It will not change the amount I pay, (iii) I do not have knowledge about energy conservation, (iv) I feel it is not critical, (v) There is no motivationto do that, and (vi) It is not convenientfor me. The results obtained are presented in Table 4.

Table 4: Reasons for non-involvement in energy saving activities

	NR	*I do not pay the bill*	*It will not change the amount I pay*	*I do not have knowledge about energy conservation*	*I feel it is not critical*	*There is no motivationt o do that*	*It is not convenientf or me*
		Yes(%)	Yes(%)	Yes(%)	Yes(%)	Yes(%)	Yes(%)
Male	461	49.7	49.7	46.6	36.9	52.9	39.0
Female	422	37.4	42.9	38.2	21.3	45.3	28.0
SHS1	235	46.4	47.7	39.1	28.5	49.4	34.5
SHS2	365	44.9	50.4	51.2	34.2	52.3	38.4
SHS3	283	40.3	40.3	34.3	24.0	45.2	27.2
Business	148	42.6	38.5	35.8	26.4	47.3	26.4
Gen. Arts	285	37.9	46.7	48.4	31.6	44.9	27.7

	NR	*I do not pay the bill*	*It will not change the amount I pay*	*I do not have knowledge about energy conservation*	*I feel it is not critical*	*There is no motivationt o do that*	*It is not convenientf or me*
		Yes(%)	Yes(%)	Yes(%)	Yes(%)	Yes(%)	Yes(%)
Home Eco.	161	44.1	52.8	48.4	37.9	52.8	31.7
Science	180	42.2	38.9	25.0	23.9	46.1	20.0
Visual Arts	109	63.3	59.6	56.9	59.6	63.3	50.5

It can be seen from Table 4 that not a high percentage of the students, in all categories, would not support energy saving efforts for the reasons indicated. The females are least concerned about factors that would not make them support energy saving efforts. In terms of study level, SHS2 students expressed least concern, while based on programme of study, Science students expressed least concern.

3.7. Awareness of causes of electric shocks and electric fires

The knowledge of students pertaining to possible causes of electric shocks was determined. Tables 5a and 5b show the percentage levels of awareness. The tables show that a high percentage of the students (in all categories) are aware of the causes of electric shocks and electric fires. The only exception is awareness of the fact that plugs with only two prongs can cause electric shock. It is worth noting that standard sockets in Ghana use three prongs, with the third prong being connected to a local earth. In terms of average level of awareness, the groups with the superior percentages are males, SHS1 and Visual Arts.

Table 5a: Awareness of the causes of electric shocks and electric fires

	NR	*Connecting appliance cables directly to sockets*	*Overloading extension cables*	*Frayed or cracked cables, or exposed conductors*	*Flickering light bulbs and lights that dim when you use certain appliances*	*Plugs that spark when you try to plug them in*
		Yes(%)	Yes(%)	Yes(%)	Yes(%)	Yes(%)
Male	461	85.9	93.1	92.2	73.1	85.5
Female	422	80.1	93.8	91.5	70.6	87.9
SHS1	235	88.1	94.0	89.8	77.9	90.6
SHS2	365	83.0	92.1	93.4	70.4	87.4
SHS3	283	79.2	94.7	91.5	68.9	82.3

	NR	*Connecting appliance cables directly to sockets*	*Overloading extension cables*	*Frayed or cracked cables, or exposed conductors*	*Flickering light bulbs and lights that dim when you use certain appliances*	*Plugs that spark when you try to plug them in*
		Yes(%)	Yes(%)	Yes(%)	Yes(%)	Yes(%)
Business	148	73.6	87.8	87.2	69.6	80.4
Gen. Arts	285	86.7	94.4	93.0	70.2	86.7
Hom. Eco.	161	84.5	95.0	92.5	77.6	89.4
Science	180	82.6	95.0	92.8	67.2	87.2
Vis. Arts	109	72.3	93.6	92.7	78.9	90.8

Table 5b: Awareness of the causes of electric shocks and fires

	NR	*Plugs with only two prongs*	*Outlets that buzz, crackle or hiss*	*Circuit breakers and fuses that trip or short constantly*	*Light switches that are hot to touch*	*Electrical wires and fuse boxes that feel hot to touch*
		Yes(%)	Yes(%)	Yes(%)	Yes(%)	Yes(%)
Male	461	61.8	71.4	72.2	82.9	82.6
Female	422	50.0	70.4	71.8	83.4	85.8
SHS1	235	62.1	76.2	75.3	88.1	88.9
SHS2	365	55.1	68.5	73.7	82.5	82.5
SHS3	283	52.7	69.6	67.1	79.9	82.3
Business	148	55.4	69.6	64.2	79.1	81.1
Genera Arts	285	53.0	69.8	69.1	83.9	83.5
Home Econ.	161	57.8	70.2	82.0	86.3	88.2
Science	180	53.3	68.9	68.3	79.4	80.0
Visual Arts	109	67.9	68.9	81.7	88.1	90.8

3.8. Awareness of preventive measures against electric shocks and electric fires

The level of awareness regarding preventive measures against electric shocks and electric fires was also determined. The preventive measures considered and the results obtained are presented in Tables 6a and 6b. The tables show that most students (of all categories) are aware of preventive measures against electric shocks and electric fires. The females showed greater average awareness while in the other categories, SHS1 and Home Economics students had the highest average awareness.

Table 6a: Awareness of preventive measures to avoid electric shocks and fires

	NR	*Make sure all electrical outlets are fitted and tight to the wall*	*Do not tamper with electrical plugs*	*Replace any frayed or cracked electrical cords*	*Use extension cords as a temporary measure*	*Keep electrical cords away from water, heat sources and high traffic areas*
		Yes(%)	Yes(%)	Yes(%)	Yes(%)	Yes(%)
Male	461	90.2	88.3	88.1	74.4	92.2
Female	422	91.5	89.1	85.5	78.0	95.5
SHS1	235	92.8	91.1	90.6	80.9	95.3
SHS2	365	89.3	88.8	83.6	73.2	93.7
SHS3	283	91.2	86.9	88.0	76.0	93.9
Business	148	87.2	85.1	83.1	73.0	89.9
Gen. Arts	285	93.7	88.4	83.5	76.1	93.0
Home Econ.	161	91.9	88.8	89.4	84.5	96.3
Science	180	90.0	91.1	92.2	71.1	95.0
Visual Arts	109	88.1	89.9	88.1	76.1	95.4

Table 6b: Awareness of preventive measures to avoid electric shocks and fires

	NR	*Ensure socket outlets have child safety covers or spring-latch covers*	*Utilize three-prong plugs when possible*	*Disconnect appliances from socket outlets when not in use*	*Disconnect appliances before cleaning them*	*Use earth leakage breakers/ ground fault interrupters*
		Yes(%)	Yes(%)	Yes(%)	Yes(%)	Yes(%)
Male	461	86.1	77.4	89.2	93.1	77.4
Female	422	87.4	71.8	93.6	94.3	70.6
SHS1	235	90.2	78.7	90.6	95.3	76.2
SHS2	365	85.2	75.6	91.8	94.0	71.8
SHS3	283	85.9	70.3	91.2	91.9	75.6
Business	148	81.8	68.9	87.2	89.2	73.0
General Arts	285	85.3	71.9	91.9	96.1	71.9
Home Econ.	161	91.3	83.2	95.0	95.7	73.9
Science	180	87.8	77.8	91.7	92.8	76.1
Visual Arts	109	89.0	72.5	89.0	91.7	78.9

4. CONCLUSION

This work has evaluated the levels of awareness of senior high school students on issues that bother on electric energy conservation, electric safety and electric fires. The study evaluated the levels of awareness based on three categories namely, gender, programme of study and academic study level. The study revealed that the students have very high levels of awareness (more than 75% in most cases) of electric safety, electric fires, and energy savings issues related to the use of refrigerators, electronic devices, heating loads and lighting. Again, a very high percentage are inclined to factors that would motivate them to support institutional efforts to conserve electrical energy. A low percentage leaned towards factors that would not make them support energy saving efforts. The female students indicated greater average level of awareness than their male counterparts. In terms of level of academic study, SHS1 students showed highest average level of awareness. With regards to programme of study, students of the Home Economics programme (a programme that is almost entirely done by females) showed the greatest average level of awareness. The findings presented will positively influence the approach to electric energy related campaigns in secondary schools.

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