An Exploratory Study of Factors that Influence Higher Education Students' Ironing Behaviour

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Abstract Ironing is one of the household activities that consume considerable amount of energy with high financial and environmental implications. Even though ironing has adverse impact on energy consumption, studies on ironing, specifically, in the context of students' energy usage are limited. Hence this paper reports on an exploratory study with objective of exploring the factors that underlie ironing behaviour of residential students of higher education institutions. Data for the study were obtained through focus group technique and analysed using qualitative content analysis in MAXQDA 12 qualitative analysis software. The result of the study revealed that majority of the students in residential facilities do not practice bulk ironing which was attributed to attitude; perceived behavioural control; social factors; physical factors such as availability of space for hanging ironed clothes; availability of power; and background of the individual students. Our findings could help managers of institutions to formulate appropriate strategies and policy framework to address students' excessive energy consumption through ironing in their residential facilities. Practical implications of the study are discussed.

Keywords Energy, Behaviour, Bulk Ironing, Higher Education Institutions, Residential Students

1. Introduction

Organisations and countries requires quality amount of energy in their daily activities. The most common types of energy used in buildings are electricity and gas. These types of energy are quite often obtained from carbon dioxide and greenhouse gases laden resources such as coal, oil and natural gas [1]. Previous studies indicate that energy consumed through human activities in residence and offices could amount to 50% of overall energy consumed in the industrialised nations [2]; and human behaviour

contributes significantly to variations in energy consumption in identical buildings [25]. This is because energy used in buildings are not consumed by the buildings themselves [3] but rather, the building systems and devices housed by these buildings convert the energy into energy services [4], which are enjoyed by the building occupants. Examples of energy services include space cooling and heating, light, comfort, and cleanliness. One of these services, cleanliness, is associated with laundry and ironing. Laundry is understood as a process of clothing care, a process by which clothes that have been in contact with the body are cleansed and their value attributes such as style, feel and image are restored [4]. In this way, ironing plays a key role in restoring the value attributes of clothes, which cannot be achieved without energy. Yet, ironing is one of the high energy consuming household activities.

1.1. Effect of Ironing on Energy Consumption

Generally, studies on ironing and energy consumption are scanty. Mentioning of ironing in some few occasions has been made in studies involving general household energy behaviour [5], [6], [7] and ironing of school uniform [9]. Also, ironing is considered as part of clothe cleaning process in the study by Bain *et al.* [8]. It is estimated that ironing of school uniform in Malaysia would consume 3819 GWh of energy between 2010 and 2030 [9] while domestic ironing in UK is estimated to consume 1.5TWh of energy annually [8]. Bain *et al.* [8] assert that a small decrease in ironing time could reduce considerably, the energy consumed in ironing. However, none of these studies considers the role of the human factor in the ironing process, in other words, understanding the behaviour of the people vis-à-vis ironing and how to encourage bulk ironing practices in order to reduce energy consumption.

Practising bulk ironing is believed to consume less energy, so researchers and power suppliers advocate for bulk ironing of clothes to reduce energy consumption [9], [10]. For instance, it is estimated that a1200w rated iron

consumes only 0.4 kWh of electricity in one hour using an electric iron that has automatic cut-off thermostat as the iron was observed to be switched on only 30% of the time [26] (Biljli Bachao Team, 2016). This supports the idea that undertaking proper ironing practices, such as bulk ironing would reduce one's energy consumption. However, ironing clothes as and when one is needed seems easy to do. In other words, people seem to find it difficult to engage in bulk ironing as energy saving behaviour.

Performing energy saving behaviour is influenced by a wide variety of internal and external factors [11], [12]. Examples of internal factors that may motivate or impede a person from saving energy include being aware of the need to reduce energy consumption and how to go about it; individual's status, comfort, effort, convenience [12], [13], [14]; attitudinal factors such as environmental concerns, and normative beliefs [15], inconvenience, and futility [16].

On the other hand, a person can save energy only when he has the capability or opportunity to do so. This opportunity is underpinned by economic consideration, accessibility and characteristics of physical infrastructure, and cultural factors [12]. Depending on the presence or absence, and strength of these factors, promoting energy saving through psychological motivation could be of no significance [12], [17]. Thus, minimal resistance from external factors to the performance of a desirable behaviour may, more likely, enable people to engage in the behaviour. In contrary, if these factors strongly inhibit the performance of the behaviour in question, many people would not be encouraged to engage in it. Thus, with understanding of these factors regarding residential students' ironing behaviour, appropriate promotional programmes could be initiated [16] by managers of these facilities to ensure that energy consumption is reduced. Hence, as one of the energy use activities performed quite often by higher education residential students in Ghana, coupled with seemingly lack of research in this area, an exploratory study was conducted to understand the influencing factors of students' ironing behaviour.

2. Methodology

The study was conducted using focus group technique involving residential students from six higher education institutions in Ghana. Purposive sampling was used to recruit participants, where potential participants were identified and approached with assistance of managers of the students' accommodation facilities. Focus group size ranged between six and ten participants per focus group.

2.1. Procedure

As a characteristic of qualitative research, it is difficult to determine in advance the sample size of a study.

However, by rule of thumb, using three or four focus groups are adequate on a subject [18]. Nonetheless, a total of six focus group sessions were conducted. The focus group sessions were held within the campuses of the respective institutions and each lasted between 45 and 65 minutes discussing topics relating to ironing behaviour (including questions about lighting use and ventilation behaviours which are not included in this paper). Before the commencement of each focus group discussion, a preliminary discussion was made in which the researcher and his assistant as well as participants took turn to present themselves. In addition, the objective of the study was explained at the beginning of each focus group session to participants, and an informed consent forms were also signed by the participants. No student was less than 18 years of age and therefore did not warrant parental consent. A total of 47 students which consists of 24 males and 23 females with a mean age of 22.2 years and a mean period in school of 2.34 years, participated in the focus group sessions.

2.2. Data Analysis

All focus group sessions were audio recorded. Data obtained from the audio recorders were transcribed verbatim and analysed using MAXQDA 12 qualitative analysis software to encode all quotes. The data were analysed using abductive content analysis approach [19], [20]. This approach entails combination of both deductive and inductive analytical approaches. As a first step, previous studies and focus group questions guide enabled prior development of broad-brush codes such as attitudes, perceived behavioural control, social factors and external or facilitating conditions alongside some emerging codes and data segments coded into these codes upon exploration of the data set. In the second step, the broad-brush codes were retrieved, reflected upon and inductively recoded to reflect the data across the dataset. Thus, both the deductive and inductive processes occurred iteratively throughout the analysis which yielded the findings as discussed in the next section.

3. Results and Discussion

Although, previous studies suggest that ironing clothes in batches has potential of saving energy [9], it obviously appears that the common ironing practice among residential students in the studied institutions is to iron one's clothes whenever one is needed instead of ironing and storing them for use over a period of time. Accordingly, majority of the participants of the study, 86.5% as presented in Table 1, indicated that most of the students in their residence do not engage in bulk ironing but rather, they iron their clothes just at the time that they are about to wear them, stating that between 5 and 10% of the students

in their residence engage in bulk ironing. This is exemplified by the comments made by one of our study participants: "In my room all of us we iron when we are going out and then I have a friend in [another room], they also do the same, I don't see them ironing in bulk, so if I should look at it and it should cut across, I will give 5%".

Table 1. Level of students' engagement in bulk ironing

Level of engagement	%
High	8.1
Medium	5.4
Low	86.5
Total	100

Note: **Low** refers to description of less than 30% of the student population engaging in bulk ironing; **Medium** is between 30% and 50% engaging in the bulk ironing; and **High** refers to more than 50% engaging in bulk ironing.

It is observed from the works of the Bijli Bachao Team [26] that 1200 watt rated auto-cut-off iron when used continuously for 1 hour consumed only 0.4kWh of electricity, that is, the iron is switched on only 30% of the time. Thus, if a person irons in bulk so that he uses 1 hour every week, then his energy consumption in a month on ironing will be $0.4\text{kWh} \times 4 = 1.6\text{kWh}$. On the other hand, if a person irons every day for 10 minutes, he will spend 5 hours in a month on ironing, and his monthly energy consumption will be $((1200/1000) \times 5 = 6\text{kWh})$. Hence, comparing bulk ironing with daily ironing reveals that excess of 4.4kWh of electricity will be used on the daily basis. Therefore, for example, in a university with 5000 students are accommodated in the institution's students' residential facilities, where about 70% of these students (3,500 students) as found in the current study, iron their clothes on daily basis, spending, say 10 minutes each, this will translate into $4.4\text{kWh} \times 3,500 = 15,400\text{kWh}$ of electricity which could have been saved if bulk ironing is practiced. With the current end user average tariff of GH¢0.65 per kWh in Ghana [27], this will translate into GH¢10,010.00 monthly savings, culminating in total

savings of GH¢80,080.00 for ironing in bulk within the facilities in an academic year of 8 months.

In investigating the students' ironing behaviour, the results reveal a number of factors that influence students' ironing practices as illustrated by Figure 1. These factors are discussed in turn.

3.1 Attitude

Attitude towards behaviour refers to the tendency to respond consistently, favourable or unfavourable, to the behaviour; and is formed from one's beliefs about the outcomes and evaluation of the outcomes of the behaviour, that is, the perceived consequences of the behaviour, which in this case, is ironing clothes in bulk. Attitude was perceived as the most important factor that prevents students from engaging in bulk ironing. Almost all participants (about 94%) identified various forms of attitudinal factors that underpin students' ironing behaviour: inconvenience, uncertainty, apathy, and energy concern. Many of our study participants (60%) identified inconvenience to impede bulk ironing practices among students in their residences. Inconvenience was framed as the belief that after ironing one's clothes and storing them, the clothes may crumple for lack of appropriate space. This situation would require re-ironing at the time one wants to wear any of the ironed dresses. Similarly, the situation, where one has to iron a new dress just because whatever reason he decides to change the dress, was considered to create inconvenience. As one participant asserted "most at times they think when they iron it in bulk it will crumple in the next moment. So they iron bit by bit." Another participant questioned the need to iron one's clothes in bulk: "...instead of ironing everything and then when I want to wear it I have to iron again why don't I iron [it] when I just want to wear?" Inconvenience was more associated with ironing the already ironed dress again or changing it and ironing a new dress. This situation of re-ironing discourages students from engaging in bulk ironing.

Figure 1. Influencing factors of higher education residential students' ironing behaviour

Apathy was identified by about 36% of focus group participants to influence residential students to practice bulk ironing or not. Apathy was framed as not seeing bulk ironing as important or useful activity, or lack of enthusiasm to perform bulk ironing. Some participants expressed that there are more important things to do than to gather one's clothes and iron them at a time. They indicated that some students believe that bulk ironing is time wasting. As one participant put it, "most people also take that to be a waste of time, because if you have one hour to iron your things in bulk and you have a quiz to write tomorrow, although it is time for you to iron your clothes in bulk, you would like to go and learn towards the quiz so that you don't waste that time..." Another participant explained that some students do not consider ironing their clothes in bulk as important: "I don't think people do it, because even in my room I do it, I have hangers but the rest of my roommates, they say they see no need for ironing [in bulk]."

3.2. Perceived Behavioural Control

Furthermore, focus group participants identified certain control factors perceived to influence students to practice bulk ironing or not. Perceived behavioural control (PBC) was framed as the difficulty or the confidence the student has to engage in bulk ironing behaviour. As can be seen from Figure 1, 57% of our study participants identified PBC factors of time and effort. Some participants suggested that lack of time on the part of students obstructs them from ironing clothes in bulk. For instance, as one participant indicated, the number of activities performed by

students is such that there are not sufficient time for one to iron many clothes at a time: "It looks as if from Monday to Friday we have lectures throughout so the only free period is Saturday, where you can be at the hostel for just some few times, go to campus already, so you just have some little time to do other things, like cooking and stuffs, you don't have enough time to take more clothes and iron them all".

Also, few participants (about 21%) indicated that students' intention to undertake bulk ironing or not is underpinned by the perception that one needs extra energy to undertake the task. This can also be alluded to the effort needed to iron clothe in bulk. As one participants stated, "...you hardly find people doing that since it is a difficult task to pile up your dresses and iron them at a time". Another participant also stressed, "one thing that I know is...ironing is a work, like, even when you are ironing and the iron is heated you will be sweating and those stuffs". This sentiment was expressed across the various focus groups, emphasizing on the stressful nature of ironing and for that matter bulk ironing.

3.3. Habit

Habit is described as a behavioural pattern that has been repeatedly occurred and has almost become automatic, that is, a routinized behaviour. Some participants (about 43%) identified that students ironing behaviours appear to be more of a habit. They pointed out that the practice of ironing one clothe at the time the clothe is needed is a common practice by most of the residential students: "...people iron when they want to, say, this is the dress I

am coming to wear, and they take it and iron it.” In addition, another participant asserted, “in fact, we don’t like ironing, so if you are going somewhere you feel that the dress needs to be ironed then you iron.” Habit was strongly identified with inconvenience, that is, since students believe that when they iron clothes in batches, the dresses may crumple, they resort to daily ironing which has become habitual.

3.4. Physical Factors

Physical factors refer to the presence or absence of physical constraints that impede or enhance the performance of behaviour. In the context of this study, physical factors, as identified by focus group participants, were mostly observed as obstacles to engage in bulk ironing. The significant obstacle to the adoption of bulk ironing behaviour identified by participants relates to the availability of appropriate space for keeping one’s ironed clothes. With access to appropriate facility, one would avoid the inconvenience of having to iron his/her clothes again before using them. Most participants indicated that the available space for keeping their clothes after ironing requires that they fold the clothes which do not encourage them to engage in bulk ironing. One participant explained, “I think the nature of our lockers, in which we having our clothes is also a factor that amount to it, because most people are not having a place that they will hang their dresses. Normally after ironing, you have to fold it again and put it in the locker.”

Also, few participants expressed physical constraints in terms of not having logistics such as hangers or personal electric iron to impede students from practising bulk ironing. As one participant suggested: “...if there are a lot of hangers available, I think it will somehow, motivate [students] to iron in bulk.” Physical barriers were mostly expressed in association with attitudinal factor of inconvenience. In other words, the absence of appropriate storage facilities creates concern for convenience, thus discouraging students from engaging in bulk ironing.

3.5. Social Factors

Social factors comprise normative beliefs, role beliefs and self-concepts. From Figure 1, it is observed that 28% of focus group participants identified some social factors to influence ironing behaviour of students. Norms include both normative beliefs (social or subjective norms) and personal norms. Social norms refer to the influence of some important referent others in the social group on the individual to take an action or not. In this context, social norms refer to action and/or inaction of others such as friends; the belief of students regarding the expectations of other people in the university community concerning their dressing to underpin students’ decision not to practice bulk ironing. For instance, one participant stated: “...if your roommates see that you are ironing so many clothes they

used to ask questions and then they try to say that you are given them pressure as in, you are different. They see ironing in bulk as for people who are from very strict homes...So me I don’t like ironing in bulk because they will talk about it, and they will see you as someone who is different among them; it is not the norm on campus.” In the same vein, another participant posited that, “the people I live with don’t [iron in bulk], so it seems like there is no pressure on me”. Social norms with increasing desire and pressure from referent group influence individuals to conform to the norms of the social group [21]. These submissions clearly support the assertion that, membership of a social group could influence a person’s intention to perform a certain behaviour such as ironing one’s clothes in bulk. Thus, the above submissions are indicative of social norm as hindrance to the enactment of a desirable energy saving behaviour. Carefully analysing these comments reveals two normative beliefs: the belief of unfavourable comments by friends and perception regarding the upbringing of people who engage in bulk ironing and being ‘odd’ among the group; and the belief that colleagues do not practice bulk ironing and therefore not feeling pressured to do same. Both beliefs motivated conformity to the norm in the students’ residential facilities regarding ironing, thus preventing students from engaging in bulk ironing in order save energy.

Also, students’ decision not to iron one’s clothes in bulk was associated with the belief about the expectation of the higher education community of the appearance of dresses one wears. One participant quizzed, “We are in an educational world and fashion world, that lets say, dressing is the order of the day, so it is like if I wear my clothe and I see line, it won’t even look good to me, how much more someone?”

Furthermore, few participants related students’ decision not to iron their clothes together to students’ role regarding payment of electricity cost. The participants explained that because students are not those paying for the electricity used, they do not have any motivation to save energy by practising bulk ironing. One participant posited: “the hostel belongs to the government, and anything that belongs to the government, I think from human perception we can use it anyhow...It is not my home too.” Thus, the role concept which refers to the kind of behaviours deemed suitable for persons holding certain positions in a group, that is, the person who pays for the electricity consumed is responsible for saving energy [22], suggests that students may begin to practice energy saving such as bulk ironing should they be made financially liable for their energy consumption.

Another social factor observed to influence students’ intention to practice bulk ironing or not was ‘self-concept’. Self-concept as explained by Triandis [23] consists of the ideas a person has about him/herself, the goal that is proper for the person to pursue or desist from, and an act the person performs or does not perform. Few participants identified self as a factor that influence students’ intention

to engage or not to engage in bulk ironing. One participant suggested self as motivation factor for engaging in bulk ironing: "I don't really need anybody to encourage me to do what I think is right" whereas another participant opined that "Nobody discourages us, it is ourselves, it's like personal" while responding to the existence of people in their community who either encourage or discourage the practice of bulk ironing.

3.6. Availability of Power

Furthermore, Figure 1 indicates that 26% of the focus group participants identified availability of power to influence students' ironing behaviour. The effect of power supply on students' ironing behaviour was framed in two ways. First, lack of access to continuous supply of power was framed as encouraging as well as discouraging bulk ironing practice: "Because of the light off, I iron my things in bulk and put them down...when there is light off I have what to wear." On the contrary, another participant asserted that "you might be ironing and the light [power] will be off, that means, you have to stop and iron the next time; so you can't even iron in bulk". Second, having access to continuous supply of power was seen as a hindrance to engaging in bulk ironing. One participant explained that, having a standby plant to provide continuous supply of power makes it unnecessary to engage in bulk ironing; but in the absence of standby plant, anytime there is power, "you need to iron and put it down", thus, supporting the school of thought that power outage encourages bulk ironing.

3.7. Students' Background

Engaging in energy saving behaviour is also perceived to be influenced by the immediate social environment, that is, the family and the upbringing of the individual. Some focus group participants suggested that their current engagement in bulk ironing practice resulted from the training provided by their family whilst at home. Accordingly, whilst in school, they have continued to practice this behaviour; it has become part of them. One participant explained: "...when I was in the house...my father instructed us to [iron in bulk] that was why I was always ironing". In addition, another participant posited, "I had been doing it already before I came here, so I have been advising my roommate to also iron her clothes in bulk." Again, another participant echoed how family influence has made her to engage in bulk ironing: "Yeah, it is my uncle [who encourages me to iron in bulk]. He does that well." The foregoing discussion shows clearly that in homes where desirable energy use behaviours such as bulk ironing practice are instituted, they appear to have much impact on students' behaviour in school. On the other hand, students from homes where such practices are neither performed nor encouraged are more likely not to practice them.

4. Practical Implication

Our result reveals that practising bulk ironing by higher education residential students in order to save energy is minimal; and that multiple factors underpin students' ironing behaviour. Like the outcome of previous studies, energy saving cost in terms of convenience, time, and effort [11], [25] seems to prevent residential students from engaging in bulk ironing. It appears that promoting energy saving among residential students in terms of ironing would have to overcome the belief that bulk ironing would compromise the quality of the appearance of their clothes, that is, ironed clothes would crumple upon storage.

In addition, the results show that students lack the enthusiasm to practice bulk ironing, and sometimes are prevented from engaging in the practice on the basis of peers' comments and other normative beliefs. Furthermore, our results clearly indicate that lack of access to appropriate storage facilities like wardrobes and hangers impedes students from performing energy saving behaviour of ironing clothes in bulk.

Moreover, our study attempts to fill the gap that existed in literature regarding studies involving ironing behaviours and their corresponding factors that appear to influence residential students' decision to engage in bulk ironing or not. The study was carried out in the context of six Ghanaian higher education institutions.

The implication of our study is that students engaging in bulk ironing has effect on the consumption of energy, and hence on the financial bottom-line of higher education institutions. As depicted in the discussions in section 3, this behaviour contributes to the depletion of energy resources, that is, power in Ghana. Relating to the illustration in Table 1, students ironing in bulk places cost burden on the organisations. This implies that, promoting bulk ironing among students would help in energy savings and scarce financial resources. But since attitude is a major influencing factor, and in itself, generally, underpinned by knowledge and beliefs, managers of higher education should promote bulk ironing behaviour through workshops and other didactics interventions; educating students during freshmen orientation on ironing in bulk in addition to a deliberate, comprehensive, and regular educational programmes on bulk ironing of their clothes would be able to change the students' attitude towards bulk ironing. Also, hostel managers should institute ironing policy that requires students to iron their clothes in bulk, especially, during weekends in a common ironing rooms that should be provided by the institutions. Hostel representatives could be charged to monitor students ironing behaviour. Even though students would attempt to abuse the energy when asked to pay for consumption, however, directing the economic implication on the students such as asking them to prepay for their energy consumption with institution of appropriate sanctions would influence them to engage in positive ironing behaviour.

5. Conclusions

The aim of this exploratory study was to understand the factors that influence ironing behaviour of higher education residential students in relation to energy saving. The present study employed focus group strategy to gain insight into residential students' ironing behavioural factors towards energy savings based on the elements of the theory of interpersonal behaviour [23] and the theory of planned behaviour [24].

A significant conclusion from this study is that, students' energy saving behaviour in relation to ironing appears to be strongly influenced by variety of attitudinal factors: inconvenience, apathy; social factors: norms, roles and self-concept; perceived behavioural control factors: time and effort; and habit; interacting among themselves and also strongly associated with availability of power and physical factors. With these findings, managers of higher education institutions could formulate appropriate strategies and policy framework to address students' excessive energy consumption due to ironing in their residential facilities. These factors could be addressed through promotion of energy conservation targeting the adoption of bulk ironing by providing the relevant energy information. Providing appropriate energy-related information could enhance knowledge, thus influencing attitude which could lead to the adoption of bulk ironing behaviour. In addition, mitigating the influence of norms among the students, normative behaviour change strategies such as commitment, through wearing of bottom by students engaging in bulk ironing to indicate that, 'I iron in bulk to reduce energy consumption, so join me', and use of prompts, which have shown to be effective in fostering adoption of sustainable behaviour [17], to win those who do not engage in bulk ironing. However, for these psychological strategies to be effective the strong external barriers should be addressed because performing sustainable behaviours is costly and difficult in the face of such barriers. Therefore, policies should be put in place to provide the appropriate storage facilities whilst ensuring that students are made to pay appropriately for their energy consumption.

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REFERENCES

- [1] Sovacool, B. K., Sidortsov, R. V., & Jones, B. R. 2014. *Energy Security, Equity and Justice*. London New York: Routledge.

- [2] Schipper, L., Bartlett, S., Hawk, D., & Vine, E. 1989. Linking life-styles and energy use: A matter of time? *Annual Review Energy* 14:273-320.
- [3] Janda, K. B. 2011. Buildings don't use energy: people do. *Architectural Science Review* 54(1):15-22. doi:10.3763/asre.2009.0050.
- [4] Shove, E. 2003. *Comfort, Cleanliness and Convenience: The Social Organization of Normality*. Oxford, New York: Berg.
- [5] Malama, A., Mudenda, P., Ng'ombe, A., Makashini, L., & Abanda, H. 2014. The Effects of the Introduction of Prepayment Meters on the Energy Usage Behaviour of Different Housing Consumer Groups in Kitwe, Zambia. *AIMS Energy*, 2(3):237-259.
- [6] Malama, A., Makashini, L., Abanda, H., Ng'ombe, A., & Mudenda, P. 2015. A Comparative Analysis of Energy Usage and Energy Efficiency Behavior in Low- and High-Income Households: The Case of Kitwe, Zambia. *Resources* 4:871-902. Doi: 10.3390/resources4040871.
- [7] Morley, J., & Hazas, M. 2011. The significance of difference: Understanding variation in household energy consumption. Paper presented at the *ECEEE 2011 SUMMER STUDY*.
- [8] Bain, J., Beton, A., Schultze, A., Dowling, M., Holdway, R., & Owens, J. 2009. Reducing the environmental impact of clothes cleaning. [Online]. From: <http://randd.defra.gov.uk>. [Accessed on 12 March 2016].
- [9] Rosmin N, Yusof MZ, Musta'amal AH. 2013. Energy consumption study on school uniform ironing: A case study in Malaysia. *International Journal of Education and Research*. 1(9):1-16.
- [10] RURA. 2012. Guidelines promoting Energy Efficiency Measures, R.U.R. Agency, Editor. [Online]. From www.rura.gov.rw. [Accessed on 19 February 2016].
- [11] Kaplowitz, M. D., Thorp, L., Coleman, K., & Kwame Yeboah, F. Energy conservation attitudes, knowledge, and behaviors in science 2012. Laboratories. *Energy Policy* 50:581-591.
- [12] Steg, L. 2008. Promoting household energy conservation. *Energy Policy*, 36:4449-4453.
- [13] Abrahamse, W., Steg, L., Vlek, C., & Rothengatter, T. 2005. A review of intervention studies aimed at household energy conservation. *Journal of Environmental Psychology*, 25:273-291.
- [14] Stern, P.C. 2000. Toward a Coherent Theory of Environmentally Significant Behavior. *Journal of Social Issues* 56(3):407-424.
- [15] Lindenberg S, Steg L. 2007. Normative, gain and hedonic goal frames guiding environmental behavior. *Journal of Social issues*, 63(1):117-137.
- [16] Stokes, L.C., Mildenerger M, Savan B, Kolenda B. 2012. Analyzing Barriers to Energy Conservation in Residences and Offices: The Rewire Program at the University of Toronto. *Applied Environmental Education and Communication*. 11:88-98.
- [17] McKenzie-Mohr, D., Schultz, P. W. 2014. Choosing

- effective behavior change tools. *Social Marketing Quarterly*, 20(1):35-46.
- [18] Krueger, R. A. 1998. *Analyzing and Reporting Focus Group Results: Focus Group Kit6*. Thousand Oaks London New Delhi: SAGE Publications.
- [19] Silver, C., Lewins, A. 2014. *Using Software in Qualitative Research: A Step-by-Step Guide*. 2 Ed. Los Angeles, London, New Delhi, Singapore, Washington DC: SAGE.
- [20] Mayring, P. 2014. Qualitative Content Analysis: Theoretical Foundation, Basic Procedures and Software Solution. Klagenfurt 2014. [Online]. From: <http://nbn-resolving.de/urn:nbn:de:0168-ssoar-395173>. [Accessed on 5 April 2015].
- [21] Moody, G.D., Siponen, M. 2013. Using the theory of interpersonal behavior to explain non-work-related personal use of the Internet at work. *Information and Management* 50(6):322-335.
- [22] Martiskainen, M. 2007. Affecting consumer behaviour on energy demand. [Online]. From https://www.researchgate.net/profile/Mari_Martiskainen/publication. [Accessed on 30 December 2013].
- [23] Triandis, H. 1977. *Interpersonal Behaviour*. Monterey, CA: Brooks/Cole.
- [24] Ajzen, I. 1991. The Theory of Planned Behavior. *Organizational Behaviour and Human Decision Processes* 50:179-211.
- [25] Gill, Z.M., Tierney, M.J., Pegg, I.M., Allan N. 2010. Low-energy dwellings: the contribution of behaviours to actual performance. *Building Research & Information*, 38(5):491-508.
- [26] Biljli Bachao Team. 2016. Using electric or steam iron effectively for ironing clothes [Online]. From www.bijlibachao.com [Accessed on 10 November, 2017]
- [27] Electricity Company of Ghana. 2017. Electricity tariff reckoner effective 7th April, 2017. [Online] From <http://www.ecgonline.info/index.php/customer-care/service-s/tariff>. [Accessed on 10 November, 2017]