INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH & DEVELOPMENT

ISSN: 2278 – 0211 (Online)

A Study Into Mobile Phone Consumption Behavior In Ghana: The Case Of Marketing Students In Sunyani Polytechnic, Ghana, West Africa

Mr. Samuel Yeboah Asuamah
Lecturer At Sunyani Polytechnic, Ghana, West Africa
Mr Cosmos Antwi-Boateng
Lecturer At Sunyani Polytechnic, Ghana, West Africa
Mrs Vida Owusu-Prempeh
Lecturer At Sunyani Polytechnic, Ghana, West Africa

Abstract:

The aim of the paper is to contribute to the body of knowledge in the area of sustainable development by examining respondent's mobile phone consumption behaviour to determine reasons behind phone replacement. The research design is quantitative descriptive cross sectional survey of a sample of 182 students of Sunyani Polytechnic selected through convenience sample method. Primary data was collected using self-designed questionnaire, administered during lecture hours. SPSS version 16.0 was used to analyse data to determine frequencies, percentages and analysis of variances and presented in Tables. Respondents form emotional attachment with their phones which makes them feel reluctant to discard their phone. New technology, damaged mobile phones are the most important motives for mobile phone replacement. Future study should examine the strategies appropriate for the production of sustainable phones from the perspective of consumers. Manufacturers of mobile phones should incorporate the findings into their production strategies.

Keywords: *Emotional attachment; motive of replacement; durability; new technology; E-waste*
Jel Classification: *Q56; D11; D12; L67; L68*

1. Introduction

The issue of Sustainable consumption in relation to sustainable development has raised interest in research in the area of mobile phone usage in developed and developing economies. In the developed economies such as the U.S., there is high usage of mobile phones with high rate of replacement (Wilhelm et al. 2011). Most consumers do not recycle their phones but replace them.

There is a similar trend in some developing economies such as Ghana. There is high mobile phone penetration in Ghana. Mobile phone is used by the adolescent, youth and the aged age groups in Ghana. Yet little is known in the literature on the motive for replacement and how the used ones are disposed.

Researchers have indicated that some replaced phones function well and as such more studies on reasons of discarding is welcome in the literature (Wilhelm et al. 2011; Geyer & Blass, 2010; Gordon, 2009; Hanks et al. 2008). The frequency of replacement of mobile phones in economies by users has made phones to have shorter product lifetime than most electronic devices (Smith, 2010; Slade, 2006).

Wilhelm (2012) analysis on phone consumption established that "respondents had owned an average of 4.4 mobile phones in their lifetime as students. They expected their current phones to last almost three years, but would prefer a phone with a functional lifetime of more than five years". This calls for strategies that will ensure that manufacturers produce long lasting or lifetime phones.

In a similar study by Wilhelm et al. (2011) they revealed that majority (75%) of respondents have owned from 3-6 phones in their 20 years while as 60% of them replace their phone every 1-2 years. Hanks et al. (2008) in earlier studies established similar results on phone consumption. The frequency of discarding phones according to researchers (Wilhelm et al. 2011) is influenced by demographic and socio-economic variables such as income, gender and age. The preferred lifetime of the phones in the study is three or four years (over 50%) and five or more years (30%). The expected lifetime of phone according to the respondents (students) and some phone managers in 2years according to the study by Wilhelm et al. (2011).

Researchers have indicated that consumers do not form strong emotional attachment with the mobile phones they use and as such are able to discard their phones frequently. This is due to factors such as: inability to personalize the external casings of a mobile phone; inability to fix or repair most mobile phones oneself; the material qualities of electronic products do not have the potential for timeless beauty and preservation of

personal histories that a product made out of wood or metal might and market developments/strategies such as frequent technological advances, short design lives and style changes may encourage individuals to consider mobile phones transient fashion items rather than durable goods (Ho & Lee, 2011; Nieuwenhuis, 2008; Slade, 2006; Bloch et al. 2003; Cripps & Meyer, 1994).

Researchers (van Nes, 2010; Cooper, 2005; van Nes & Cramer, 2005; Okada, 2001; Roster, 2001) have identified reasons of product replacement but few studies (Wilhelm et al. 2011; Cripps & Meyer, 1994) have documented the motives for replacing mobile phone in the literature. In a study by Wilhelm et al. (2011), they established that respondents replaced their phones and the most important factors are the discount on a new, upgraded phone received during contract renewal (42%) and the need to replace a lost or severely damaged phone (40%). Other factors identified in the study (Wilhelm et al. 2011) are technological advancements, new styles and lower prices.

On the disposal of old phones few studies have been done in the literature and further studies are also welcome in this area (Wilhelm, 2012; Wilhelm et al. 2011). Wilhelm (2012) established that consumers disposed off their phones through: recycling; use as backup; given as gift; throw away/dumping and trading old phone in for new Phone.

1. 1. Statement/Justification

Though a lot of mobile phone users replace their phones few empirical work exist in the literature in both developed economies and developing economies and the reasons for discarding their phones and strategies to increase lifetime of mobile phones. Hence more empirical research is required to develop strategies to ensure sustainable consumption and also determine why consumers replace their phones and how they also dispose off the used phones (Wilhelm et al. 2011; Raghavan, 2010; Guiltinan, 2009; deCoverly et al. 2008; Jacoby et al. 1977).

The researchers intend to investigate the reasons behind phone replacement among students of Sunyani Polytechnic and also to examine the strategies to increase mobile phone lifetime. In the very knowledge of the researchers no such empirical study exists in the study area and the current paper fills in the literature gap.

The results provide reference material for future researchers in similar study area. The findings also provide policy guide to marketers and manufacturers of mobile phones with strategies to meet the demands of consumers.

1.2. Global Objectives/Specific Objectives

The paper contributes to the body of knowledge that exists in the area of sustainable consumption by investigating the reasons behind mobile phone replacement. Specifically, the paper investigates mobile phone consumption and the motivation for mobile phone discarding. Methods of disposal of old phones are also identified as well as attitude towards global climate change and electronic waste (e-waste).

1.4. Research Questions and Assumptions

The paper is based on the research questions which are:

- What factors account for the replacement of old phones?
- What disposal methods are used in discarding old phones?
- What are the attitudes of respondents towards sustainable consumption in relation to mobile phone consumption?

Answers are provided for these questions using survey data collected from respondents who are students and use mobile phones. The paper is based on the assumption that consumer's motivation to discard phone is influenced new technology and that consumer in the survey have positive attitude towards environmental sustainability.

2. Methodology

The paper is based on explorative, quantitative, cross-sectional survey using 182 respondents selected through purposive sample method. The target population is the students in marketing one and two in Sunyani Polytechnic. Data collected were analysed using percentages, means, and standard deviation, skewness for descriptive statistics and One-way Analysis of Variance (ANOVA) for the inferential statistics. Results were presented in tables.

The findings of the paper are limited by the use of survey data. Some respondents might have been biased with their responses. The paper does not look at the penetration of mobile phones and what phones are used for or the preferences of mobile phones. Data are not collected from all departments of school.

3. Results And Discussions

The results of the survey are presented in this section of the paper. The sample profile is provided followed by mobile phone product lifetimes and disposal behavior, emotional attachment, replacement motives and strategies to extend product lifetime.

3.1. Sample Characteristics

Majorities of the respondents are males (58.2%) and the age distribution indicates that most (53.3%) respondent's falls in the age group of 18-22. Most (39%) of them are from Ashanti region where as majority (50.5%) are in second year. The rest of the results are shown in Table 1.

Variables	Frequency	Percentages (%)
Gender	106	
Male	73	58.2
Female	3	40.1
Missing responses	182	1.6
Total		100.0
Age		
Less than 18	3	
18-22	97	1.6
23-27	74	53.3
28-32	3	40.7
33-37	1	1.6
Above 42	2	0.5
Missing responses	2	1.1
Total	182	1.1
Region		100.0
Brong Ahafo		
Ashanti	50	
Western	71	27.5
Eastern	10	39.0
Volta	13	5.5
Greater Accra	5	7.1
Central	6	2.7
Northern	8	3.3
Upper east	6	4.4
Upper west	3	3.3
Missing response	7	1.6
Total	3	3.8
	182	1.6
Year in school		100
First year		
Second year	89	
Missing response	92	48.9

Total	1	50.5
	182	0.5
Religion		100.0
No religion		
Christian	6	
Muslim	155	3.3
Other religion	18	85.2
Missing responses	1	9.9
Total	2	0.5
	182	1.1
Family income status		100.0
Low		
High	19	
Medium	37	10.4
I don't know	106	20.3
Missing response	19	58.2
Total	1	10.4
	182	0.5
Personality type		100.0
Individual		
Collectivistic	84	
I don't know	77	46.2
Missing responses	20	42.3
Total	1	11.0
	182	0.5
		100.0

Table 1: Distribution of responses on Demographic features

(Source: field survey March, 2013)

3.2. Mobile phone Product Lifetimes and Disposal Behavior

The sample's ownership profile is summarized in Table 2a and Table 2b. Majority (83.0%) of respondents have purchased mobile phone before with most (29.1%) owning from 3-5 phones which is consistent with the findings of Wilhelm et al. (2011) and

Hanks et al. (2008). Significant majority (95.6%) believed it is important to own a mobile phone. Most (39%) have used mobile phone for the period 5-7years.

Most (35.7%) of the respondents expect their phone to last for 2years. The 2years expected design life of a phone is consistent with the findings of Wilhelm et al. (2011) and EPA (2008). Most (31.3%) respondents desired lifetime of phone is 3-5years. The finding is consistent with that of Wilhelm et al. (2011). Majority (81.3%) are of the view that lifetime information on package of phone is important in using mobile phone. This is consistent with the findings of Wilhelm (2012). Majority (54.4%) of the respondents are not willing to purchase phones made from recycled materials which is inconsistent with the findings of Wilhelm (2012). Wilhelm (2012) reported that about 97% of the respondents in the study were somewhat or very willing to buy phone made from recycled material.

Majority (62.1%) indicated that they do not discard old phones with another majority (71.4%) not discarding functioning mobile phones. On methods of disposal of mobile phones, most (36.8%) dispose off old phones by giving it away as gift. Few of the respondents recycle phone as a way of disposing old phones. The finding is contrary to that of Wilhelm (2012) who reported that most (64%) recycled their phones as a way of disposing off their old phones. Few respondents (8%) give away their phones. On the frequency of recycling most respondents (48.9%) recycle phone 'sometimes'. Majority (85.2%) of the respondents are concerned with global climate change with another majority (75.3%) concerned with e-waste. These are also consistent with the findings of Wilhelm (2012) and Wilhelm et al. (2011).

The findings on mobile phone consumption, motive for replacement, emotional attachment and disposal methods indicates that respondents have positive attitude towards sustainable consumption.

Bought a mobile phone before	• Yes	151(83.0%)
Is it important to own a mobile phone	• Yes	174(95.6%)
Willingness to buy a phone made from recycled materials	• No	99(54.4%)
Importance of providing phone lifetime info on package	• Yes	148(81.3%)
Number of phones owned	• 3-5	53(29.1%)
How long have you used mobile a phone	• 5-7years	71(39.0%)
Expected life time of your phone	• 2years	65(35.7%)
Desired lifetime of your phone	• 3-5years	57(31.3%)
Method of disposing off an old phone	• I give it away	67(36.8%)
Do you discard your old phone	• No	113(62.1%)
Do you discard your phone that is functioning well	• No	130(71.4%)
Frequency of recycling at home	• Sometimes	89(48.9%)
Concerned about global climate change?	• Yes	155(85.2%)
Concerned about e-waste	• Yes	137(75.3%)

Table 2a: Mobile phone ownership profile

Bought a mobile phone before	• Yes	151(83.0%)
	• No	27(14.8%)
	• I don't know	4(2.2%)
	• Total	182(100%)
Is it important to own a mobile phone	• Yes	174(95.6%)
	• No	3(1.6%)
	• I don't know	2(1.1%)
	• Missing responses	3(1.6%)
	• Total	182(100%)
Willingness to buy phones made from recycled materials	• Yes	49(26.9%)
	• No	99(54.4%)
	• I don't know	29(15.9%)
	• Missing responses	5(2.7%)
	• Total	182(100%)
Importance of providing phone lifetime info on package	• Yes	148(81.3%)
	• No	22(12.1%)
	• I don't know	8(4.4%)
	• Missing responses	4(2.2%)
	• Total	182(100%)
Number of phones owned	• 1	39(21.4%)
	• 2	41(22.5%)
	• 3-5	53(29.1%)
	• Above 5	36(19.8%)
	• I don't know	12(6.6%)
	• Missing responses	1(0.5%)
	• Total	182(100%)

How long have you used a mobile phone	• Less than year 21(11.5%) • 2-4years 59(32.4%) • 5-7years 71(39.0%) • 8-10years 18(9.9%) • Above 10years 10(5.5%) • Missing response 3(1.6%) • Total 182(100%)
Expected life time of your phone	• 1year 25(13.7%) • 2years 65(35.7%) • 3-5years 53(29.1%) • Above 5years 36(19.8%) • Missing responses 3(1.6%) • Total 182(100%)
Desired lifetime of your phone	• 1year 26(14.3%) • 2years 52(28.6%) • 3-5years 57(31.3%) • Above 5years 40(22.0%) • Missing responses 7(3.8%) • Total 182(100%)
Method of disposing off old phone	• I recycle it 14(7.7%) • I keep it as backup 50(27.5%) • I give it away 67(36.8%) • I throw it away 15(8.2%) • I trade in for new phone 36(19.8%) • Total 182(100%)
Do you discard your old phone	• Yes 47(25.8%) • No 113(62.1%) • I don't know 19(10.4%) • Missing responses 3(1.6%) • Total 182(100%)
Do you discard your phone that is functioning well	• Yes 34(18.7%) • No 130(71.4%) • I don't know 16(8.8%) • Missing responses 2(1.1%) • Total 182(100%)
Frequency of recycling at home	• Frequently 18(9.9%) • Sometimes 89(48.9%) • I don't know 68(37.4%) • Missing responses 7(3.8%) • Total 182(100%)
Concerned with global climate change?	• Yes 155(85.2%) • No 12(6.6%) • I don't know 12(6.6%) • Missing responses 3(1.6%) • Total 182(100%)
Concerned with e-waste	• Yes 137(75.3%)

	• No 29(15.9%) • I don't know 13(7.1%) • Missing responses 3(1.6%) • Total 182(100%)

Table 2b: Mobile phone ownership profile

3.3. Emotional Attachment

The analysis on emotional attachment revealed that majority (65.9%) of the respondents form emotional attachment with some of their mobile phones. Most (52.7%) do not forget of their old phones when they purchase new ones and feel reluctant (46.2%) to discard their old phones. These findings are inconsistent with the findings of Wilhelm et al. (2011) study in which respondents did not form any emotional attachment with a particular phone. Some researchers (Wilhelm et al., 2011; Odom & Pierce, 2009; Odom et al., 2009; Nieuwenhuis, 2008 and Walker, 2006) reported that respondents form emotional attachment with the benefits of the mobile phones and not the phone itself.

Majority (50%) of the respondents do not feel guilty of discarding an old phone which is contrary to the findings of Wilhelm et al. (2011) in which respondents felt guilty and mild shame in discarding old phones. Wilhelm et al. (2011) reported that feeling of guilt is the only emotion associated with discarding an old one that is functioning. The results are shown in Table 3.

Forget quickly about the old phone when you have a new phone	• Yes 76(41.8%) • No 96(52.7%) • I don't know 6(3.3%) • Missing responses 4(2.2%) • Total 182(100%)
Emotional attachment to a particular phone	• Yes 120(65.9%) • No 50(27.5%) • I don't know 7(3.8%) • Missing responses 5(2.7%) • Total 182(100%)
Do you feel reluctant to discard your old phone	• Yes 84(46.2%) • No 76(41.8%) • I don't know 16(8.8%) • Missing responses 6(3.3%) • Total 182(100%)
Do you feel guilty for discarding your old phone	• Yes 66(36.3%)

	• No 91(50.0%) • I don't know 17(9.3%) • Missing responses 8(4.3%) • Total 182(100%)

Table 3: Results on emotional attachments

3.4. Replacement Motives

The motives for replacing mobile phones were examined. The most important reasons for phone replacement in the survey is new technology which is inconsistent with the findings of Wilhelm et al. (2011) who reported Upgrade discount with contract renewal as the most important motive for phone replacement. The second most important attribute is damaged mobile phones. This is consistent with the findings of Wilhelm et al. (2011). The results are shown in Table 4. Upgrade discount with contract renewal is the least reason to replace a phone in the survey since phones are not on contract bases in the study area.

Motives	**Frequency/percentage**
New technology/version	133(73.1%)
Damaged mobile phone	106(58.3%)
Lost mobile phone	104(57.1%)
Low price on new phone	96(52.7%)
Upgrade discount with contract renewal	78(42.8%)

Table 4: Distribution of ranked responses on replacement motives

(Source: field survey, March, 2013)

3.7. Results On Variation In Responses:

One-way analysis of variance (ANOVA) was used to analyse the variation in response given by respondents in relation to the independent variables (gender, age and region). There are statistical significant (at 1%, 5%, and 10%) variations in some responses in relation to Gender, age, region, personality type, religion and family income level. The results are shown in Tables 5 to 10.

The findings are consistent with earlier research (Wilhelm et al. 2011 and Cripps & Meyer, 1994) on the effects of demographic variables on the mobile phone product lifetimes and disposal behaviour, emotional attachment and replacement motives.

STATEMENTS	F -VALUES	P-VALUES
Purchase mobile phone before	4.443	0.036
Lifetime information on package of phone is important	3.193	0.076
Willing to buy a phone made from recycled material	3.860	0.051
Frequency of recycle of phone at home	3.686	0.057
Concerned with global climate change	4.33	0.039
Do you discard your old phone	2.813	0.095
Lost mobile phones influence replacement	3.109	0.080
Do you feel reluctant to discard your old phone	9.822	0.002

Table 5: ANOVA results on effect of gender on responses to questions

STATEMENTS	F -VALUES	P-VALUES
Purchase of a mobile phone before	2.707	0.022
Number of years of using mobile phones	3.251	0.008
Lifetime information on package of phone is important	2.522	0.031
Willing to buy a phone made from recycled material	2.014	0.079
Method of phone disposal	3.506	0.005
Emotional attachment to a phone	2.383	0.040

Table 6: ANOVA results on effect of age on responses to questions

STATEMENTS	F -VALUES	P-VALUES
Number of phones owned	2.593	0.008
Number of years of using mobile phones	2.202	0.024
Frequency of phone recycling at home	1.813	0.069
Emotional attachment to a particular phone	1.778	0.0776

Table 7: ANOVA results on effect of region on responses to questions

STATEMENTS	F -VALUES	P-VALUES
number of phones owned	3.238	0.024
lifetime information on package of phone is important	2.444	0.066
Do you discard your old phone	2.765	0.043
Lost mobile phones	2.702	0.047
Do you feel guilty for discarding an old phone	3.364	0.020

Table 8: ANOVA results on effect of family income level on responses to questions

STATEMENTS	F -VALUES	P-VALUES
Expected life time of your phone	2.492	0.062
Low price on new phone	4.067	0.008

Table 9: ANOVA results on effect of personality on responses to questions

STATEMENTS	F –VALUES	P-VALUES
Bought a mobile phone before	6.513	0.000
important to own a mobile phone	3.143	0.027
lifetime information on package of phone is important	5.624	0.001
Willing to buy a phone made from recycled material	6.523	0.000
how often do you recycle phone at home	2.633	0.052
Damaged mobile phone	2.589	0.055
Forget quickly about the old phone when you have new phone	2.449	0.065

Table 10: ANOVA results on effect of religion on responses to questions

4. Conclusions And Policy Implications

The objectives of the paper have been achieved. Respondents use lots of mobile phones and have owned more than 3 phones. Respondents expect their mobile phones to last longer and desire to have phones that will last longer. Old phones are given out to other people to use. Respondents form emotional attachments with their phone and feel reluctant to discard old phones. People replace their phones due to new technologies and phone damage. Variations in responses result from demographic variables.

Respondents have positive environmental attitude and behaviour and engage in sustainable consumption and behaviour. Manufacturers and designers of mobile phones should incorporate the findings into their production policies to be able to meet the expectations of their customers. Producers should also be responsible in relation to sustainable development by producing durable phones to increase the lifetime of mobile products.

Future study should examine strategies that will ensure sustainable production and consumption. Lager sample size should be used in future studies. Since the current study is descriptive in nature causal studies should be considered in future analysis. The study should be replicated in other departments in the school.

5.Reference

1. Bloch, P. H., Brunel, F. F., & Arnold T. J. (2003). Individual differences in the centrality of visual product aesthetics: concept and measurement. *Journal of Consumer Research*, 29,551-565.

2. Cooper, T. (2005). Slower Consumption: Reflections on Product Life Spans and the "Throwaway Society."*Journal of Industrial Ecology,* 9(1-2), 51-68.

3. Cripps, J. D., & Meyer, R. J. (1994). Heuristics and biases in timing the replacement of durable products. *Journal of Consumer Research,* 21, 304-318.

4. de Coverly, E., McDonagh, P., O'Malley, M., & Patterson, M. (2008). Hidden mountain: the social avoidance of waste. *Journal of Macromarketing,* 28(3), 289-303.

5. Environmental Protection Agency (EPA) (2008). Statistics on the management of used and end-of-life electronics.

6. Geyer, R., & Blass, V. D. (2010). The economics of cell phone reuse and recycling. *International Journal of Manufacturing Technology,* 47, 515-525.

7. Gordon, B. R. (2009). A dynamic model of consumer replacement cycles in the PC processor industry. *Marketing Science,* 28(5), 846-867.

8. Guiltinan, J. (2009). Creative destruction and destructive creations: environmental ethics and planned obsolescence. *Journal of Business Ethics,* 89, 19-28.

9. Hanks, K., Odom, W., Roedl, D., & Blevis, E. (2008). Sustainable Millennial: attitudes toward sustainability and the material effects of interactive technologies. *Proceedings of the 2008 Conference on Human Factors in Computing Systems (CHI),* Florence, Italy, 333-342.

10. Ho, J. C., & Lee, C. (2011). Factors underlying personalisation adoption: case of mobile telephony. *International Journal of Services Technology and Management,* 15(3/4), 281-297.

11. Jacoby, J., Berning, C. K., & Dietvorst, T. F. (1977). What about disposition? *Journal of Marketing,* 41(April), 22-28.

12. Nieuwenhuis, P. (2008). From banger to classic – a model for sustainable car consumption? *International Journal of Consumer Studies,* 32, 648-655.

13. Odom, W., & Pierce, J. (2009). Improving with age: designing enduring interactive products. *Proceedings of the 2009 Conference on Human Factors in Computing Systems (CHI),* Boston, MA, 3793-3798.

14. Odom, W., Pierce, J., Stolterman, E., & Blevis, E. (2009). Understanding why we preserve some things and discard others in the context of interaction design. *Proceedings of the 2009 Conference on Human Factors in Computing Systems (CHI),* Boston, MA, 1053-1062.

15. Okada, E. M. (2001). Trade-ins, mental accounting, and product replacement decisions. *Journal of Consumer Research,* 27, 433-446.

16. Roster, C. (2001). Letting go: the process and meaning of dispossession in the lives of consumers. In M. Gilly and J. Meyers-Levy (Eds.), *Advances in Consumer Research, 28.* Provo, UT: *Association for Consumer Research,* 425–430.

17. Slade, G. (2006). *Made to break: technology and obsolescence in America*. Boston: Harvard University Press.

18. Smith, A. (2010). *Mobile access 2010: a project of the Pew Research Center*. Retrieved April 3, 2011, from: http://pewinternet.org/Reports/2010/Mobile-Access-2010.aspx

19. van Nes, N. & Cramer, J. (2005). Influencing product lifetime through product design. *Business Strategy and the Environment, 14*, 286-299.

20. van Nes, N. (2010). Understanding replacement behavior and exploring design solutions. In T. Cooper (Ed.), *Longer lasting products* (pp.107-132). Surrey, England: Gower Publishing Limited.

21. Walker, S. (2006). *Sustainable by Design: Explorations in Theory and Practice.* London: Earthscan.

22. Wilhelm, W. B. (2012). Encouraging Sustainable Consumption through Product Lifetime Extension: The Case of Mobile Phones Wendy Bryce Wilhelm. *International Journal of Business and Social Science, 3(3),* 17-32.

23. Wilhelm, W., Yankov, A., & Magee, P. (2011). Mobile Phone Consumption Behavior and the Need for Sustainability Innovations. *Journal of Strategic Innovation and Sustainability vol. 7(2), 20-40*.