

THE INFLUENCE OF MEDIA EXPOSURE, SAFETY AND HEALTH CONCERNS, AND SELF-EFFICACY ON ENVIRONMENTAL ATTITUDES TOWARDS ELECTRONIC GREEN PRODUCTS

Iman Khalid A. Qader^{1*} and Yuserrie Zainuddin²

*¹School of Management, Universiti Sains Malaysia
11800 USM, Pulau Pinang, Malaysia*

*²Faculty of Manufacturing Engineering and Technology Management
Universiti Malaysia Pahang, 26300 Gambang, Kuantan, Pahang, Malaysia*

*Corresponding author: iman@usm.my

ABSTRACT

As the high-tech industry evolves at a rapid pace, vast amounts of hazardous materials are used in fuelling its global expansion. These rapid changes in production processes are significantly depleting natural resources. With the surge of popular interest and awareness pertaining to environmental issues, organisations may be in peril if consumers' attitudes towards their products are ignored. This study intends to understand consumers' environmental attitudes towards electronic green products and to identify the effect of three factors, namely, media exposure, safety and health concerns, and self-efficacy, on this attitude. Data were collected via a self-administered questionnaire among 170 respondents in a public university. The results of the study indicated that safety and health concerns as well as self-efficacy had significant positive impacts on consumers' environmental attitudes. Surprisingly, however, media exposure did not exhibit any significant influence on consumers' environmental attitude. It is recommended that campaign and awareness projects focus on safety and health issues. Additionally, media should play a more active role in increasing environmental awareness among consumers.

Keywords: environmental attitude, media exposure, safety and health concerns, self-efficacy, green electronic products

INTRODUCTION

With the surge of popular interest and awareness pertaining to environmental issues, organisations may be in peril if consumers' attitudes towards their products are ignored. In the context of consumerism, those who are aware of and interested in environmental issues are called green consumers (Soonthonsmai, 2007). Green consumers are those who prefer to purchase 'green products',

products that will not pollute the earth or deplete natural resources and can be recycled or conserved as well as products that utilise less toxic materials to reduce the impact on the natural environment (Shamdasani, Chon-Lin, & Richmond, 1993). These green consumers often organise petitions, boycott manufacturers and retailers and actively promote the preservation of the environment. Ottman (1992) reported that consumers accepted green products when their primary need for performance, quality, convenience, and affordability were met and when they understood how a green product could help to solve environmental problems. The knowledge gap on the uses and values of green products prevents consumers from committing themselves to any purchase decisions. In addition, green consumers often translate their environmental concern into actively being committed to purchasing green products (Martin & Simintiras, 1995).

In the context of electronic products, it is reported that these products may contain more than 1,000 different substances, some of which are potentially hazardous to the environment and to human health. These materials, if not properly recycled, could release substances into the air, soil, and water and have a direct polluting impact on the environment and an indirect polluting impact on humans. One of these hazardous substances is lead. Lead is an alloy that is used in soldering electronic components on PCBs; it is mostly used on computer keyboards, mobile phones, cameras, DVDs, (Kluge & Riley, 2008). With the short life-cycle of the electronic products and the high demand worldwide due to constant upgrading to new equipment, there is a high possibility that the disposal of the old equipment may result in environmental pollution.

Viewing the increasing problem of pollution due to the change in product lines, especially in the high-technology industry, this study intends to identify consumers' attitudes towards the problem of pollution caused by the disposal of high-tech electronic products at the end of the products' life cycle. Specifically, this study intends to explore the factors that influence consumers' environmental attitudes towards green electronic products, which includes media exposure, safety and health concerns, and self-efficacy. Consumers' environmental attitudes in the context of this study refers to the collection of beliefs, affect, and behavioural intentions that a person holds regarding environmentally related activities or issues (American Psychological Association, 2001).

LITERATURE REVIEW

Environmental Attitude

Recent research suggests that despite high levels of "green attitudes", environmental concern has failed to translate into widespread environmental action (Roper Organization, 1990; Dunlap & Scarce, 1991; Wall, 1995). Over two decades of environmental attitude research have resulted in a multitude of studies dedicated to discovering the social determinants of environmental attitudes (Van Liere & Dunlap, 1981). Much of the social scientific investigation of environmental attitudes in recent years, rather than remaining focused on demographic predictors, has instead turned to explanations for the widespread popularity of environmental issues. There is also evidence suggesting that people believe that environmental conditions are deteriorating and that concern for quality of life has given way, in many cases, to concern about health issues, and life itself, for human and non-human species (Dunlap & Scarce, 1991).

Maloney and Ward (1973) argued that during the last few decades, the relationship between human beings and the environment has been an important issue, due to the fact that natural resources have been used up at a faster pace than they can be restored. Environmental problems are viewed by many as being caused by faulty human behaviour and psychology; given this, improving ecological behaviour can have an important role in the amelioration of these problems (Maloney & Ward, 1973). One way to contribute to this is through the study of environmental attitudes (EA) that may underlie ecological behaviour. "Environment concern" is the term typically used in empirical literature to refer to EA (Fransson & Garling, 1999; Dunlap & Jones, 2002). Many researchers use the two terms synonymously (Van Liere & Dunlap, 1981; Dunlap & Jones, 2003), whereas others have differentiated between them (Stern & Dietz, 1994; Schultz, Shriver, Tabanico, & Khazian, 2004). Nevertheless, EA seems to be the preferred term in psychology, as environmental concern is now viewed as a general attitude (Bamberg, 2003), and EA represent the psychological index term that is generally used (American Psychological Association, 2001). EA have been defined as the collection of beliefs, affect, and behavioural intentions a person holds regarding environmentally related activities or issues.

Media Exposure

Most researchers agree that media play a major role in the widespread dissemination of environmental concern (Lowe & Rudig, 1987; Lowe & Morrison, 1984). The amount and type of media coverage of environmental disasters and conflicts has helped transform many specific problems into a major public issue. "Journalistic preference for the negative and the dramatic,"

combined with the conflictive nature of debate between environmentalists and non-environmentalists, shapes the overall message delivered to the public (Lowe & Morrison, 1984; Hays, 1987). As Lowe and Morrison (1984) pointed out, stories about environmental problems also carry with them powerful cultural symbols related to nature as well as a strong emotive and moralistic appeal.

According to DeFleur and Dennis (1998), no one disputes the fact that media can help alter behaviour and beliefs. What is important to keep in mind, however, is that most of those effects are small and, if truly effective, accumulative. In other words, tiny bits of information add up. Repetition of a message, its consistency over time, and apparent corroboration can help shift public opinion over the long term. This process has helped change attitudes and behaviour in a variety of contexts--some for better and some for worse. For example, few people now think that drunk driving is a proper thing to do. Smoking has similarly lost much of its mystique. Technical inventions and innovations from home computers to microwave ovens to cable TV took years to become fully accepted. Media stories have helped bring about those changes. Although there are many ways that people form their attitudes (Oskamp, 1977), two are relevant here: media and direct personal experience. However, Wray et al. (2005) investigated the impact of media exposure on health campaigns; in his study, evidence showed that exposure to the health campaign had limited effects, producing small increases in beliefs and behaviours among residents, whereas campaign dose exposure had a significant association between beliefs and behaviour.

Mazis and Raymond (1997) argued that advertisers use a variety of media to communicate product benefits to a target audience. For example, television commercials may be used for product demonstrations, print advertisements may be used to communicate more detailed information and to establish a brand image, and product packaging may be used to attract consumers at the point of sale (Belch & Belch, 1995). The uses of these media are often coordinated into a single integrated communications campaign (Schultz & Zelezny, 1998). However, media exposure is defined as any opportunity for a reader, viewer, or listener to see or hear an advertising message in a particular medium. One reason for using different media is that they serve different functions, they involve consumers in different ways, and they have varying levels of credibility. In a study of media involvement, the majority of consumers felt that magazines provided more specific information than other media. When seeking information on food, 41% of adult consumers referred to magazines, 26% referred to newspapers, and 15% referred to television (Magazine Publishers of America, 1991).

Safety and Health Concerns

Safety and health concerns are defined as consumers' concern regarding quality of life, health issues and the environment for humans and non-human species. However, it seems that, given the broad problems that are defined as environmental issues, the probability that individuals will be affected by one or more of these issues is high (Dunlap, 1989; Mitchell, 1990). In addition, there is also evidence suggesting that people believe environmental conditions are worsening for example, water pollution and air pollution (Dunlap & Scarce, 1991). Therefore, concern for quality of life has given way, in many cases, to concern about health issues, and life itself, for human and non-human species (Dunlap & Scarce, 1991). Therefore, the diversity and intensity of environmental problems as experienced by the public are themselves proposed as an explanation for the widespread nature of environmental concern.

According to Wall (1995), safety and health concerns are considered to be the strongest predictor of attitude and behaviour; her findings lend support to researchers who claim that increasing concern with health and safety are becoming prominent factor in shaping people's attitudes towards the environment. It also supports the self-interest-related notion that behavioural motivation increases with perceptions of personal risk.

However, Rundmo (1999) performed a study aiming to analyse how health attitudes, environmental concern and behaviour are influenced by risk perception. A self-completion questionnaire survey was distributed among Norwegian residents in 1996 and 1997. Respondents belonging to five sub-samples participated in the study, and a total of 1,124 replied to the questionnaire. Perceived risk was measured by asking the respondents to assess how 'safe' they felt from a health injury caused by specific sources of environmental and health risks. The questionnaire also contained indices of health attitudes, environmental concern, and behaviour, including health behaviour, environmental behaviour as well as consumer behaviour related to, e.g., purchasing 'green' products.

The findings of the study concluded that the respondents felt most unsafe regarding chemical food additives, infected food, industrial pollution and risks related to traffic behaviour. Attitudes towards health promotion were strongly associated with health behaviour, and environmental concern significantly affected environmental behaviour. There was also a strong correlation between the different types of behaviour. Attitudes and environmental concern explained 40% of the variance in environmental as well as consumer behaviour. In a number of studies, environmental concern has been found to be a major determinant of buying green products (e.g., Brombacher & Hamm, 1990) another determinant is concern for one's health.

However, Zhang (2005) carried out a study in Tianjin city on Chinese consumers to gain an insight into Chinese consumers' knowledge and concerns regarding food safety. The results of his study indicated that Chinese consumers are very much concerned about food safety, particularly with regard to vegetables and dairy products, but it seems that Chinese consumers know little about organic foods. Empirical results show that young and highly educated men are the main consumers of so-called pollution-free food, promoted by the Chinese government, and highly educated and variety-seeking consumers are most likely to purchase organic food products in the future.

Self-Efficacy

Motivation research has established that self-efficacy is strongly related to performance. Self-efficacy refers to a person's belief in his or her capability to perform a task as referred to by Bandura (1977) and Cervone and Peak (1986) has related self-efficacy to diverse outcomes such as problem solving, learning achievements (Campbell & Hackett, 1986), adaptability to new technology (Hill, Smith, & Mann, 1987), and training effectiveness (Earley, 1994). Because self-efficacy refers to a person's beliefs concerning his/her ability to successfully perform a given task or behaviour as defined by Bandura (1977), low self-efficacy expectations regarding a behaviour or behavioural domain lead to the avoidance of those behaviours, and increases in self-efficacy expectations should increase the frequency of approach behaviour relative to avoidance behaviour. However, this study identifies self-efficacy expectations as a person's beliefs concerning his/her ability to successfully perform a given task or behaviour (Bandura, 1977). Therefore, applying the term to this study, self-efficacy is defined as judgment of how well respondents can execute required actions to deal with specific situations and, in this case, their attitude towards green electronic products.

FRAMEWORK AND HYPOTHESES

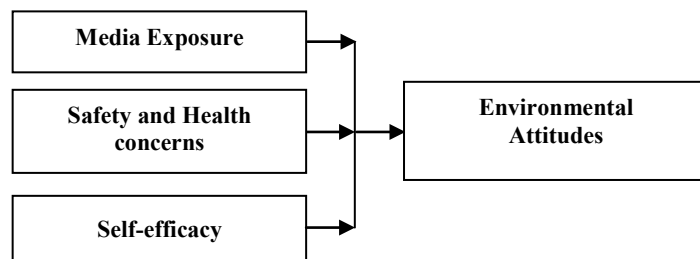


Figure 1: Research model of factors influencing environmental attitude

Based on the foregoing literature, it can be argued that media exposure, safety and health concerns, and self-efficacy are all important predictors of environmental attitude. Therefore, the following set of hypotheses was developed:

H₁: Media exposure has a positive influence on consumers' environmental attitude.

H₂: Safety and health concerns have a positive influence on consumers' environmental attitude.

H₃: Self-efficacy has a positive influence on consumers' environmental attitude.

THE THEORY OF PLANNED BEHAVIOUR

Azjen (1985) proposed an adjusted model called the "theory of planned behaviour", which argues that the extent to which one's intentions to perform behaviours can be carried out depends in part on the amount of resources and control one has over this behaviour. That is, the resources and opportunities available to a person must, to some extent, dictate the likelihood of a certain behaviour. Therefore, perceived behavioural control was added to the two other constructs of theory attitudes and subjective norms; it reflects beliefs regarding access to the resources and opportunities needed to perform a behaviour (Azjen, 1991; Taylor & Todd, 1995). It may encompass two components. The first component reflects the availability of resources needed to engage in the behaviour. This may include access to money, time, and other resources. The second component reflects the focal person's self-confidence in the ability to conduct the behaviour.

Attitude

Consumers' environmental attitude relates to the attitude-related portion of the theory because a person's attitude toward a behaviour consists of 1) a belief that that particular behaviour leads to a certain outcome and 2) an evaluation of the outcome of that behaviour. If the outcome seems beneficial to the individual, he or she may then intend to or actually participate in a particular behaviour (Azjen & Fishbein, 1980).

Media Exposure

Consumers' media exposure is related to the motivation-related portion of the theory, which includes information about a behaviour and the motivation to perform the behaviour (Azjen & Fishbein, 1980).

Self-Efficacy

Consumers' self-efficacy is related to the concept of perceived behavioural control; this concept is most compatible with Bandura's (1977) concept of perceived self-efficacy, which is concerned with one's judgment of how well he or she can execute required actions to deal with specific situations.

METHODOLOGY

Sample

The population for this study consists of full time university lecturers, lecturers were chosen because they are considered more knowledgeable and aware of environmental problems.

Measurement of Variables

Independent variable

1. Media exposure: Wray (2005) measured media exposure using 10 items using media type–exposure questions and dose-exposure questions. Therefore, the measurements for this variable will be adapted from Wray (2005) using eight items. Individuals will be asked whether they have been exposed to any advertisements through television, radio, newspapers and billboards. Individuals saying that they have would then be asked how many times they have been exposed to that type.
2. Safety and health concerns: The variable representing health and safety concerns has been measured by Wall (1995) using a statement stating "Our food is becoming unsafe because of food additives." Rundmo (1999) used three items to measure health and safety, and respondents were asked to give answers from 1 = most unsafe to 5 = extremely safe. Therefore, the measurements for this variable will be adapted from studies by Wall (1995) and Rundmo (1999); this means that respondents will have to give answers to 4 items on a scale ranging from 1 = strongly disagree to 5 = strongly agree.
3. Self-efficacy: Self-efficacy has been measured by Hill et al. (1987), from whose study the measurements for this variable have been adapted. This means that respondents will have to give answers to 4 item statements. For example: "I understand to accomplish my task with minimum damage caused to the environment" or "I am confident that I am able to engage in positive

environmental behaviour" on a scale ranging from 1 = strongly disagree to 5 = strongly agree.

Dependent variable

1. Environmental attitude: The variable representing environmental attitude was adapted from Maloney and Ward (1973). This means the respondents will have to give answers to 10 items for this variable. A five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree will be employed to measure environmental attitudes.

RESULTS AND FINDINGS

A total of 200 sets of questionnaires were distributed to academic staff working in 25 major schools at a well-known university. The drop-and-pick technique was used in distributing and collecting the questionnaires. There are a total of 898 of full-time university academic staff members working on the main and engineering campuses. Therefore, by using the stratified proportionate sampling method, a list of names of respondents working in each school was obtained either from the university directory book or from the university website, and once the population was stratified into 25 major schools, 20% of the total number of academic staff members working in each school was drawn. The 200 questionnaires were distributed, and the target number of questionnaires (sample size) to be collected was 179; however, 175 questionnaires were returned, 4 were not returned and 5 were rejected due to incompleteness and were unusable. Therefore, 170 complete sets will be used for the data analysis in this study, thereby giving a total response rate of 95%. Table 1 shows the response rate description and result.

Table 1
Response rate

| Description | Result |
|---------------------------------|------------|
| Questionnaires distributed | 200 |
| Target number of questionnaires | 179 |
| Questionnaires returned | 175 |
| Questionnaires unreturned | 4 |
| Unusable questionnaires | 5 |
| Usable questionnaires returned | 170 |
| Response rate 170/200 | 95% |

PROFILE OF RESPONDENTS

In terms of gender, 39.4% of respondents were females, and 60.6% were male; this indicates that the majority of respondents were male lecturers. In terms of age, 1.2% of respondents were below the age of 29, whereas the majority of respondents, 41.2%, were aged between 40 to 49 years, followed by 38.2% of respondents, who were between the ages of 30 and 39 years old, and the remaining 19.4% of respondents were above 50 years old. In terms of ethnic background, 72.4% of respondents were Malay, 11.2% were Chinese, 8.2% were Indians and 8.2% were other races. In terms of professional status, the majority, 48.2%, were lecturers, 33.5% were associate professors, 17.1% were senior lectures and 1.2% were professors. Therefore, from the analysis, it is apparent that the majority of respondents are lecturers, who are young and potentially holding more funds for research in future.

In terms of years of experience, 31.8% of respondents had less than 5 years, 39.4% of respondents had between 5 to 20 years, 16.5% of respondents had between 21 to 30 years, and 16.5% of respondents had between 21 to 30 years. Finally, 2.4% of respondents had above 30 years. From this analysis, it appears that the majority of respondents had a medium to high number of years of work experience; this reflects that during respondents' years of experience on the job, they are exposed to a number of research grant opportunities, which will enable them to purchase electronic products for research purposes. This is supported by the following analysis on lecturers' number of research grants awarded to them during their years of experience. However, in terms of research grants, from the analysis it appears that 81% of respondents have a research grant ranging from 1 to 32. This means that lecturers' tendency to use computers and other electronics is high; this can be shown from the number of research grants awarded to them, which enables them to purchase electronics equipment and add on peripherals such as printers, modems, and storage systems that work in conjunction with a computer.

FACTOR ANALYSIS

Safety and Health Concerns

The construct of safety and health concerns was analysed using confirmatory factor analysis to confirm the validity of the scale. Here, items were forced into one factor, all items were accepted for safety and health concerns and all items converged on a single component, explaining 70.04% of the total variance in the variable. Therefore, none of the items was dropped, and the mean for safety and health concerns was 4.20, which indicates that respondents' safety and health

concerns are high. The Kaiser-Meyer-Olkin measure of sampling is 0.82, which is considered to be an excellent score. Bartlett's test of sphericity shows significance at $p < 0.01$. Table 2 illustrates the range of factor loadings for safety and health concerns.

Table 2
Component matrix of safety and health concerns

| No. | Items | Factor loading component |
|-----|--|--------------------------|
| 1 | Our food is becoming unsafe because of environmental pollution. | 0.840 |
| 2 | Our water is becoming unsafe because of environmental pollution. | 0.876 |
| 3 | I feel at risk of getting a health injury caused by environmental pollution. | 0.811 |
| 4 | I feel at risk of consuming polluted food. | 0.818 |

Self-Efficacy

The same procedure was repeated for self-efficacy. All of the items were accepted for self-efficacy, and no items were dropped, with the items explaining 60.15% of the total variance in the variable. The mean for self-efficacy is 4.05, which indicates that respondents' self-efficacy is high. The Kaiser-Meyer-Olkin measure of sampling is 0.75, which is considered sufficient, and Bartlett's test of sphericity shows significance at $p < 0.01$. Table 3 illustrates the range of factor loadings.

Table 3
Component matrix of self-efficacy

| No. | Items | Factor loading component |
|-----|--|--------------------------|
| 1 | I understand how to accomplish my tasks with minimum damage caused to the environment. | 0.835 |
| 2 | I am confident that I am able to engage in positive environmental behaviours. | 0.857 |
| 3 | I can participate in environmental behaviours if I invest the necessary effort. | 0.719 |
| 4 | If I am faced with an environmental problem, I can usually think of several solutions. | 0.676 |

Environmental Attitude

The measurement for environmental attitude was adapted and modified to suit the Malaysian context to establish the dimensions of the study. Therefore, this study utilised exploratory factor analysis, which was run twice to analyse the construct of environmental attitude, which will help to establish groupings of items based on respondents' perceptions. After running the first factor analysis, two items were eliminated due to cross-loadings. In the second running of factor analysis, another two items were eliminated. The remaining six items were grouped under a single component, explaining 30.64% of the total variance in the variable, and the mean value for environmental attitude is 3.67, which indicates that respondents' environmental attitude is above average. The Kaiser-Meyer-Olkin measure of sampling is 0.77, which is considered to be strong, and Bartlett's test of sphericity shows significant at $p < 0.01$. Table 4 illustrates the range of factor loadings.

Table 4
Rotated component matrix of environmental attitude

| No. | Items | Factor loading component | |
|-----|--|--------------------------|--------|
| | | 1 | 2 |
| 2 | I think the government is doing enough to control pollution. | 0.660 | -0.113 |
| 4 | I am willing to write weekly to my representatives in parliament concerning environmental issues. | 0.651 | 0.137 |
| 3 | I would be willing to stop buying products from companies guilty of polluting the environment even though it might be inconvenient for me. | 0.651 | 0.130 |
| 1 | I would donate money to a foundation to help improve the environment. | 0.637 | 0.018 |
| 5 | I often discuss environmental issues with my friends. | 0.589 | 0.104 |
| 6 | I become extremely angry when I think about the harm being done to the environment by pollution. | 0.569 | 0.030 |
| 9 | I am not willing to pay a pollution tax, even if it would considerably decrease environmental pollution. | -0.068 | 0.796 |
| 7 | In my household we do not buy products just because they originate from sustainable production. | 0.186 | 0.686 |

RELIABILITY ANALYSIS

The data obtained were tested for reliability using Cronbach's Alpha. The variables that were tested include safety and health concerns, self efficacy and

environmental attitude. In this test, any item that was not significant was deleted. According to Sekaran (2003), as Cronbach's alpha approaches 1, the internal consistency reliability increases; therefore, a reliability coefficient of 0.5 and higher is acceptable. The Cronbach's alpha values for the tested variables were 0.85 for safety and health concerns, 0.77 for self-efficacy and 0.69 for environmental attitude. Media exposure was measured on a categorical scale; therefore, reliability analysis was not conducted. Therefore, according to Hair, Anderson, Tatham and Black (1995), the generally agreed-upon lower limit for Cronbach's alpha is 0.70, although it may decrease to 0.60 in exploratory research. A summary of the reliability tests for the variables is shown in Table 5.

DESCRIPTIVE STATISTICS

After carrying out the validity and reliability analyses, the items representing their respective factors were then averaged. The mean was applied as a measure of central tendency, which indicated that all variables were above their midpoint level, as indicated in Table 5. Respondents' safety and health concerns was the highest in rating ($\bar{X} = 4.19$), followed by respondents' self-efficacy ($\bar{X} = 4.05$), followed by environmental attitude, the mediating variable of the study, which had a mean value of ($\bar{X} = 3.67$), indicating that respondents' attitude towards the environment was neither high nor low. Media exposure presented the lowest rating ($\bar{X} = 1.74$). Table 5 provides a summary of descriptive statistics for media exposure, safety and health concerns, self-efficacy, environmental attitude, and purchase intention.

Table 5
Descriptive statistics

| Type of variable | Minimum | Maximum | Mean | Std. Deviation | Cronbach's Alpha |
|--------------------------|---------|---------|--------|----------------|------------------|
| Safety & Health Concerns | 1.50 | 5.00 | 4.1971 | 0.70354 | 0.85 |
| Self-efficacy | 1.00 | 5.00 | 4.0544 | 0.53741 | 0.77 |
| Environmental Attitude | 2.00 | 5.00 | 3.6716 | 0.53091 | 0.69 |
| Media exposure | 1.00 | 2.00 | 1.7471 | 0.43598 | |

REGRESSION ANALYSES: DEPENDENT VARIABLE OF ENVIRONMENTAL ATTITUDE

Regression analysis was run (see Table 6) between all of the independent variables and the dependent variable of environmental attitude; the result shows that two variables exhibited a positive impact on environmental attitude. These variables are safety and health concerns and self-efficacy; therefore, H₂ and H₃ are supported. The output shows that safety and health concerns have a significant positive impact on environmental attitude at $\beta = 0.201$, $t = 2.788$, $p < 0.01$. This indicates that as lecturers' safety and health concerns increases, their level of environmental attitude increases. Therefore, H₂ is supported. In addition, the output shows that self-efficacy had a significant positive impact on environmental attitude at $\beta = 0.315$, $t = 4.270$, $p < 0.01$. Therefore, H₃ is supported. The variation for two independent variables explained 16% of environmental attitude. This indicates that higher safety and health concerns and self-efficacy among lecturers lead to their having a more pronounced attitude regarding the environment. However, media exposure did not reveal any significant statistical influence and was insignificant at $p < 0.10$ on environmental attitudes; therefore, H₁ is not supported.

Table 6
Determinants of environmental attitude

| Variables | Beta | t-values | Sig. |
|-------------------------------|----------|----------|-------|
| Media Exposure | 0.030 | 0.402 | 0.688 |
| Safety and Health Concerns | 0.201*** | 2.788 | 0.006 |
| Self-Efficacy | 0.315*** | 4.270 | 0.000 |
| $R^2 = 0.16$ $F = 10.314$ *** | | | |

Note: *** $p < 0.01$ and ** $p < 0.05$ and * $p < 0.10$

DISCUSSION

In the current study, a measurement for media exposure was used and adapted from Wray (2005). Under this approach, media exposure was measured by the frequency and dose of exposure to various media types. However, although the findings of this study show that 88.2% of respondents are exposed to newspaper articles, 87.1% of respondents are exposed to local news stories. In addition, 58.8% of respondents are exposed to radio advertisements, and 57.1% are exposed to billboards. However, although respondents are thought to be knowledgeable, the amount of their media exposure is low (see Appendix).

This is shown from the findings that 11.2% of respondents have not been exposed to newspaper articles on environmental issues and that 52.9% have been exposed to newspaper articles on environmental issues 1–5 times in a three-month period. However, it seems that 11.8% of respondents have not seen local news stories on environmental issues, and that 53.5% have seen local news stories on environmental issues only 1–5 times in a three-month period. In addition, 40.6% of respondents have not heard radio advertisements on environmental issues, whereas 37.1% have heard a radio advertisement only 1–5 times in a three-month period. Finally, 42.4% of respondents do not recall seeing billboards related to the environment, and 16.5% of respondents remember seeing a billboard on the environment 1–5 times in a period of three months. The findings indicate that although respondents are exposed to the four types of media, their level of exposure is low.

In summary, the context of previous studies differed from the context of this study. Whereas the study by Wall (1995) was about buying green food and the study by Wray (2005) was about promoting healthy behaviour, this study was about lecturers' environmental attitude. Therefore, we can conclude that although lecturers were exposed to four types of media, the findings of this study indicated that their dose of exposure can be considered to be relatively low.

In addition, the result of this study indicated that respondents' safety and health concerns significantly influenced respondents' environmental attitude; this indicates that respondents' safety and health concerns towards the environment is high. This means that respondents' concerns regarding safety and health lead them to have a more pronounced attitude regarding the environment. This study is in line with the findings of Wall (1995), who found that safety and health concerns ranked as the strongest predictors of attitude. These findings lend support to researchers who claim that increasing concerns with safety and health are becoming a prominent factor in shaping people's attitudes towards the environment. Dunlap (1991) supports this finding and argued that concerns for quality of life have often given way to concerns about health issues, and life itself, for humans and non-human species.

Finally, the results of this study indicated that respondents' self-efficacy did influence their environmental attitudes. Self-efficacy is strongly related to environmental attitudes. The findings of this study are in line with those of Wall (1995), who reported a mean score of 4.30 and concluded that efficacy/interest affects the levels of environmental attitudes and will increase advantages associated with greater participation. Self-efficacy refers to a person's belief in his or her capability to perform a task, as referred to by Bandura (1997), and Wood and Bandura (1989). Therefore, applying the term to this study, respondents' self-efficacy is defined as their judgment of how well they can execute the required actions to influence their environmental attitude.

CONCLUSION

This study has shed some light on the problem of pollution, which is caused by the consumption of high-tech electronic products. It has also investigated the influence of media exposure on environmental attitude among lecturers, as lecturers are considered to be relatively heavy users of electronic products, due to their profession and technological consumption. These lecturers' environmental attitude towards lead-free electronic products (green electronics) is the focus of the study. The study found some revealing insights through the results of this study; safety and health concerns and self-efficacy had a significant positive influence on the lecturers' environmental attitude, whereas media exposure did not exhibit a significant positive influence on their environmental attitude. From the findings of the study, it is recommended that green organisation marketers should constantly monitor and evaluate the needs and concerns of university lecturers by taking into account lecturers' safety and health concerns and self-efficacy factors that lead to their environmental attitudes. In addition, this study suggests that because safety and health concerns are causes of concern to this group of heavy users of electronic products, any campaign and awareness projects should focus on safety and health issues to reach this group of consumers. However, although media exposure did not exhibit a significant influence on environmental attitude, it is recommended that an increase in the frequency and dose of media exposure can help optimise consumers' awareness of environmental problems, and thus lead to positive attitudes, as the media play an important role in shaping consumers' attitudes and their levels of participation in environmental actions and behaviours.

REFERENCES

- Azjen, I. (1991). The theory of planned behaviour. *Organisational Behaviour and Human Decision Processes*, 50, 179–211.
- Azjen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Khul, & J. Beckmann (Eds.), *Action-control: From cognition to behavior* (pp. 11–39). Heidelberg, Germany: Springer.
- Azjen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice Hall.
- Bamberg, S. (2003). How does environmental concern influence specific environmentally related behaviors? A new answer to an old question. *Journal of Environmental Psychology*, 23, 21–32.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychology review*, 84(2), 191–215.
- Belch, G. E., & Belch, M. A. (1995). *Advertising and promotions: An integrated marketing communications perspective*. New York: McGraw-Hill/Irwin.

- Brombacher, J., & Hamm, U. (1990). Value, environment attitudes and buying of organic food. *Journal of Economics Psychology*, 7, 1–11.
- Campbell, N. K., & Hackett, G. (1986). The effects of mathematics task performance on math self-efficacy and task interest. *Journal of Vocational Behavior*, 28, 149–162.
- Cervone, D., & Peak, P. K. (1986). Anchoring, efficacy, and action: The influence of judgmental heuristics on self-efficacy judgments and behavior. *Journal of Personality and Social Psychology*, 50, 492–501.
- DeFleur, M., & Dennis, E. (1998). *Understanding mass communication* (6th Ed.). Boston: Houghton Mifflin.
- Dunlap, R. E. (1975). The impact of political orientation on environmental attitudes and actions. *Environment and Behavior*, 7, 428–454.
- Dunlap, R. E. (1989). Public opinions and environmental policy. The "new environmental paradigm." *Journal of Environmental Education*, 9, 10–19.
- Dunlap, R. E., & Jones, R. E. (2002). Environmental concern conceptual and measurement issues. In R. E. Dunlap, & W. Michelson (Eds.), *Handbook of environmental sociology* (pp. 482–524). Westport, CT: Greenwood Press.
- Dunlap, R. E., & Scarce, R. (1991). The poll-poll trends: Environmental problems and protection. *Public Opinion Quarterly*, 55, 651–672.
- Earley, P. C. (1994). Explorations of individual and collective self: Sources of self-efficacy across cultures. *Administrative Science Quarterly*, 39, 89–117.
- Elkington, H., & Makower, J. (1988). *The green consumers*. New York: Penguin Books.
- Fransson, N., & Garling, T. (1999). Environmental concern: conceptual definitions, measurement methods, and research findings. *Journal of Environmental Psychology*, 19, 369–382.
- Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, w. C. (1995). *Multivariate data analysis*. New Jersey: Prentice-Hall International, Inc.
- Hays, S. P. (1987). *Beauty, health and performance: Environmental politics in the United States, 1955–1985*. Cambridge: Cambridge University Press.
- Hirsch, F. (1976). *Social limits to growth*. Cambridge, MA: Harvard University Press.
- Hill, T., Smith, N. D., & Mann, M. F. (1987). Role of efficacy expectations in predicting the decision to use advanced technologies. *Journal of Applied Psychology*, 72, 307–314.
- Krause, D. (1993). Environmental consciousness: An empirical study. *Journal of Environment and Behavior*, 25(1), 126–42.
- Kluge, S., & Riley, L. (2008). Teaching in virtual worlds: Opportunities and challenges. *Issues in Informing Science and Information Technology*, 5, 127–135.
- Lowe, P. D., & Rudig, W. (1987). Review article: Political ecology and the social science—The state of art. *British Journal of Political Science*, 16, 513–550.
- Lowe, P. D., & Morrison, D. (1984). Bad news or good news: Environmental politics and mass media. *Sociological Review*, 32(1), 75–90.
- Magazine Publishers of America*. 1991. New York.
- Maloney, M. P., & Ward, M. P. (1973). Ecology: let's hear it from the people—an objective scale for measurement of ecological attitudes and knowledge. *American Psychologist*, 28, 583–586.

- Martin, B., & Simintiras, A. C. (1995). The impact of green product lines on the environment: Does what they know affect how they feel? *Marketing Intelligence and Planning*, 13(4), 16–23.
- Mazis, M. B., & Raymond, M. A. (1997). Consumer perceptions of health claims in advertisements. *Journal of Consumer Affairs*, 31(16), 22–30.
- Morrison, D. G. (1979). Purchase intentions and purchase behavior. *Journal of Marketing*, 43(2), 65–74.
- Napp, D. (1995, 9–12 October). Lead-free interconnect materials for the electronic industry. In Proceeding of the 27th International SAMPE Technical Conference, Albuquerque, New Mexico.
- Oskamp, S.M. H. (1977). *Five attitudes and opinions*. Englewood Cliffs, NJ: Prentice Hall.
- Ottman, J. (1992, 6 July). Sometimes consumers will pay more to go green. *Marketing News*, 16.
- Ottman, J. (1993). *Green marketing: Challenges and opportunities for the new marketing age*. Lincolnwood, IL: NTC Business Books.
- Roper Organization. (1990). *The environment: Public attitudes and individual behavior*. New York: Author.
- Rundmo T. (1999). Perceived risk, health and consumer behavior. *Journal of Risk Research*, 2(3), 187–200.
- Said, A., Ahmadun, F., Paim, L., & Masud, J. (2003). Environmental concerns, knowledge and practices gap among Malaysian teachers. *International Journal of Sustainability in Higher Education*, 4(4), 305–313.
- Schultz, P. W., Shriver, C., Tabanico, J. J., & Khazian, A. M. (2004). Implicit connections with nature. *Journal of Environmental Psychology*, 24, 31–42.
- Schultz, P. W., & Zelezny, L. C. (1998). Values and pro environmental behavior: A five-country survey. *Journal of Cross-Cultural Psychology*, 29(4), 540–558.
- Sekaran, U. (2003). *Research methods for business* (4th Ed.). Hoboken, NJ: John Wiley & Sons.
- Shamdasani, P., Chon-Lin, G., & Richmond, D. (1993). Exploring green consumers in an oriental culture: Role of personal and marketing mix. *Advances in Consumer Research*, 20, 488–493.
- Soonthonsmai, V. (2007). Environmental or green marketing as global competitive edge: Concept, synthesis, and implication. EABR (Business) and ETLC (Teaching) Conference Proceeding, Venice, Italy.
- Stern, P. C., & Dietz, T. (1994). The value basis of environmental concern. *Journal of Social Issues*, 50, 65–84.
- Tahmassebi, C. H. (2003). Market forces versus regulation. *Energy Policy*, 20(10), 959–962.
- Taylor, S., and Todd, P. (1995). Assessing IT usage: The role of prior experience *MIS quarterly*, 19(4), 561–570.
- Tella, A., Jr. & Tella, A. (2003). Self-efficacy and locus of control as predictors of academic achievement among secondary schools students in Osun State Unity Schools. *Journal of Educational Psychology*, 1(1), 32–41.

- Tella, A., Jr. & Tella, A., Ayeni, C. O., & Omba, R. O. (2007). Self-efficacy and use of electronic information as predictors of academic performance. *Electronic Journal of Academic and Special Librarianship*, 8(2). Retrieved at http://southernlibrarianship.icaap.org/content/v08n02/tella_a01.html
- Van Liere, K. D., & Dunlap, R. E. (1981). Environment concerns: Does it make a difference how its measured? *Environment and Behavior*, 13(6), 651–676.
- Wall, G. (1995). Barriers to individual environmental action: The influence of attitudes and social experiences. *Canadian Review of Sociology & Anthropology*, 32(4), 28–465.
- Wasik, J. F. (1996). *Green marketing and management: A global perspective*. Cambridge, MA: Blackwell Publishers.
- Weigel, R., & Weigel, J. (1978). Environmental concern: The developments of environmental measures. *Journal of Personality and Social Psychology*, 33(6), 793–802.
- Wray, R. J., Jupka, K., & Ludiwg-Bell, C. (2005). A community-wide media campaign to promote walking in a Missouri town. *Prev Chronic Dis*, 2(4), 1–5.
- Zhang, K., & Tu, K. (2002). Six cases of reliability study of Pb-free solder joints in electronic packaging technology. *Materials Science and Engineering Journal*, 38, 55–105.
- Zhang, X. Y. (2005). Chinese consumers' concerns about food safety: case of Tianjin. *Journal of International Food & Agribusiness Marketing*, 17(1), 57–69.

APPENDIX

Respondents levels of exposure and dose of exposure to types of media

| Type of Media | Percent |
|---|----------------|
| Respondents exposed to newspaper articles Median number seen (1-5) | 88.2% |
| Respondents exposed to local news stories Median number seen (1-5) | 87.1% |
| Respondents exposed to radio advertisements Median number seen (1-5) | 58.8% |
| Respondents exposed to billboards Median number seen (1) | 57.1% |
| Dose of Media Exposure | Percent |
| Newspaper articles | |
| 0 (none) | 11.2% |
| 1 (low) | 52.9% |
| 2 (medium) | 21.8% |
| 3 (high) | 14.2% |
| Local news stories | |
| 0 (none) | 11.8% |
| 1 (low) | 53.5% |
| 2 (medium) | 24.7% |
| 3 (high) | 10.0% |
| Radio advertisements | |
| 0 (none) | 40.6% |
| 1 (low) | 37.1% |
| 2 (medium) | 13.5% |
| 3 (high) | 8.9% |
| Billboards | |
| 0 (none) | 42.4% |
| 1 (low) | 16.5% |
| 2 (medium) | 17.1% |
| 3 (high) | 24.1% |