The Sustainability in the Industry of Green Apparel: Are We Ready?

[1]Sharifah Shafie, [*]Arasinah Kamis

Abstract---The fashion industry is the biggest contributor to social and environmental problems starting with the manufacturing process to the consumers' disposal behavior. Generally, in Malaysia people are aware of environmental issues but the level of practices and attitudes towards environmental protection are still below expectation. The purpose of this study is to examine the factors that hinder the sustainable design and production and environmentally friendly clothing. The qualitative study design was selected using in-depth interview techniques. There were six persons comprising of clothing industry experts and lecturers from the fashion field were selected as respondents in this study. The findings indicated that factors that interfere with the design and production of sustainable clothing are materials, prices, awareness and individual responsibility. These factors were seen to impact on consumer purchasing, fashion decisions and consumer clothing production. Moreover, the implications of this study may be recommended to all stakeholders in the field of apparel in order to apply sustainability in apparel and sustainability in education to the younger generation. Therefore, the next generation need to realize the importance and responsibility of caring and protecting the environment, especially in the field of fashion, in order to adopt sustainable consumer behaviour and producing sustainable manufacturers.

Keywords---Green apparel, Sustainable fashion, Sustainability in education

I. INTRODUCTION

The fashion industry is a large and profitable industry (Rogers, Olah, & Weber, 2018)yet still struggles with environmental issues and has become a concern of today's society (Rogers et al., 2018; Saha, Bhandari, & John Mathew, 2019). For instance, the issues and problems are related to the environmental degradation, harmful chemicals, low wages, violations of labour law and child labour are some of the issues discussed in the fashion industry (Fletcher, 2008; Arasinah, Nornazira, Rahimah, Rodiah, & Farah Najwa, 2018a). The main cause of the environmental damage and destruction of nature is due to the human attitude of neglecting the tasks entrusted to them to preserve and wisely utilize God's creations. This is due to the harp; human beings are facing the consequences of neglecting preservation and conservation of nature. As a result, we determine that the occurrence of natural disasters leading to loss of life, habitat, property, animal habitat and plants (Haliza, 2017). The concept of sustainability has been part of the discourse at international level since the 80s. According to Pavlova (2009), the term sustainability or sustainable development has various meanings and definitions depending on the organization. Similarly, Huckle (1996) states that development sustainability has various definitions which depend on the ideals, knowledge, values and philosophies held, whereas (Morris, 2004; Pitt &Lubben, 2009) states that sustainable development or

[1]*Faculty of Technical and Vocational, Sultan Idris Education University, 35900 Tanjong Malim, Perak, Malaysia,*
[*]*Corresponding author: arasinah@ftv.upsi.edu.my*

sustainability was first defined in the Brundtland Commission Report, the World Commission on Environment and Development. According to Brundtland (1987: 37), sustainable development has been conceptualized in many respects. There are three key concepts in sustainable development namely environmental, economy and social. These three components are interrelated with each other(Shen, 2014; Sonya, Kim, Cosette, & Sheryl, 2013; Arasinah, Ridzwan, Shuhaila, & Farah Najwa, 2017b; Akenroye, Nygård, & Eyo, 2018). The concept of sustainable development has also been a major catalyst around the world to ensure that the needs of the people and the earth are balanced and consequently, overcome environmental pollutions. As stated by Deschamps, Carnie, dan Mao (2017), sustainable practices can be defined as activities that meet human needs while avoiding products and services that negatively impact the society or environment.

The main source of world pollution is attributed by the fashion industry (Moon, Lai, Lam, & Chang, 2015; Saha et al., 2019). The fashion industry is affecting the environment with the use of tons of water, production of excess carbon dioxide and pollution from harmful chemicals (Chen & Burns, 2006; Dickenbrok & Martinez, 2018). This is can be evinced by the statistics released by the Ministry of National Solid Waste Management where Malaysia produces about 8.4 million tons of solid waste annually and 4% of the solid waste is made up of clothing and textiles (Wai Yee, Hassan, & Ramayah, 2016). Environmental pollution also occurs through excessive use of energy in clothing production, the use of non-renewable sources for fiber production, the utilization of large quantities of water and the use of chemicals on renewable sources such as cotton. For instance, textile products from synthetic fibers such as synthetic textiles undergo long composting process and negatively affect the size of the landfill and eventually will pollute the environment(Žurga, Hladnik, & Tavčer, 2015; Arasinah, Farah Najwa, Rodia, & Emy, 2017a). Products that are environmentally friendly or recyclable may be considered as good products. Thus, textile manufacturers also need to consider the production fibers, product manufacturing processes and what will happen to the textiles during and after the product life cycle when designing their products (Chen & Burns, 2006). So, aims for this paper is to examine the factors that hinder the sustainable design and production and environmentally friendly clothing.

II. LITERATURE REVIEW

The concept of Sustainability in Fashion

Sustainability proposed to reduce environmental or social impacts by incorporating broader concepts to achieve environmental or ethical goals, including freedom, uniqueness, resistance, authenticity, trust and well-being (Bly, Gwozdz, & Reisch, 2015). Furthermore, sustainability is defined as an unchanging or conserved state (Kamus Dewan, 2002), while the definition provided by the Dewan Bahasa dan Pustaka (2007) of sustainability is long lasting, conserved forever. Moreover, it should be noted that, understanding fashion in consumer clothing has led to an increase in consumption and a change in demand patterns. Today's consumers are more towards following fashion trends and showing more willingness to adapt their outfits. As consumer demand are changing over time, the concept of fast fashion has become more popular, responding quickly to changing needs and tastes but a number of threats were seen alarming, in terms of a decrease in global reserves and increasing of industrial waste (Saricam, Erdumlu, Silan, Dogan, & Sonmezcan, 2017). Consequently, the concept of sustainability had started to be an important part of the fashion industry that enabled sustainable fashion ideas to spread.

Apart from that, sustainable fashion is conceptualized as a fashion created which considered all stages of the clothing cycle and holistic design perspectives with a system that minimizes negative impacts and aims to create positive economic, environmental and social impact (Kozlowski, Searcy, & Bardecki, 2018; Arasinah, Farah Najwa, et al., 2018b). The concept of sustainability was first developed in 1972 at the United Nations Conference. The concepts include three issues: the first is the interdependence of humans with the natural environment, second, the relationship between economic development, social development and environmental protection and third, the need for global goals and general principles (Saricam et al., 2017). Sustainable fashion also entailed good practices which aimed at enriching and positively impacting the community, community culture, other organisms and the environment and respecting and promoting diversity (Kozlowski et al., 2018). Green fashion is a new approach to "fashion with a conscience" and refers to an increasing number of ethical fashion companies trying to attract mainstream fashion consumers by offering stylish products (Saha et al., 2019).

Theory of Sustainable Development

The Theory of Planned Behaviour was founded by Ajzen and Fishbein in 1975 (McNeill & Moore, 2015). This theory was developed by Ajzen and Fishbein from The Theory of Reason Action (TRA) with the addition of controlled behavioural component in predicting intention and behaviour. In this theory, regulated behaviour refers to the extent to which an individual has the abilities and skills to perform an action. In addition, based on this theory, an important factor influencing one's behaviour is intention. The intentions of the individual are shaped by individual attitudes towards behaviour and subjective norms. For example, these attitudes include behaviour beliefs, assessment of behaviour outcomes, subjective norms, normative beliefs and motivation as shown in Fig. 2.

In addition, TPB theory is prevalent among researchers who wish to study the behaviour and tendency of a person to something in explaining that behaviour is not necessarily influenced by attitude but can also be influenced by the intention to do something (Nor Kalsum, 2016; Arasinah, Farah Najwa, et al., 2017a). In addition, TPB theory has also been used to measure the awareness of an individual towards the environment and sustainable development. In TPB theory, attitude refers to the extent to which an individual has a positive or negative attitude to a behaviour, while subjective norms refer to the perception or belief of the community around the individual in adopting a particular behaviour. According to (Razzaq, Ansari, Razzaq, & Awan, 2018) the theory of TPB fosters pro-environmental attitudes which are shaped by the positive attitude towards an individual's behaviour. First, an individual has the belief that everyone has done so, which is considered a descriptive social rule. Second, one is confident that it must be done which is considered to be an injunctive social order. Third, one has the belief to embrace the new behaviour that is considered as behaviour.
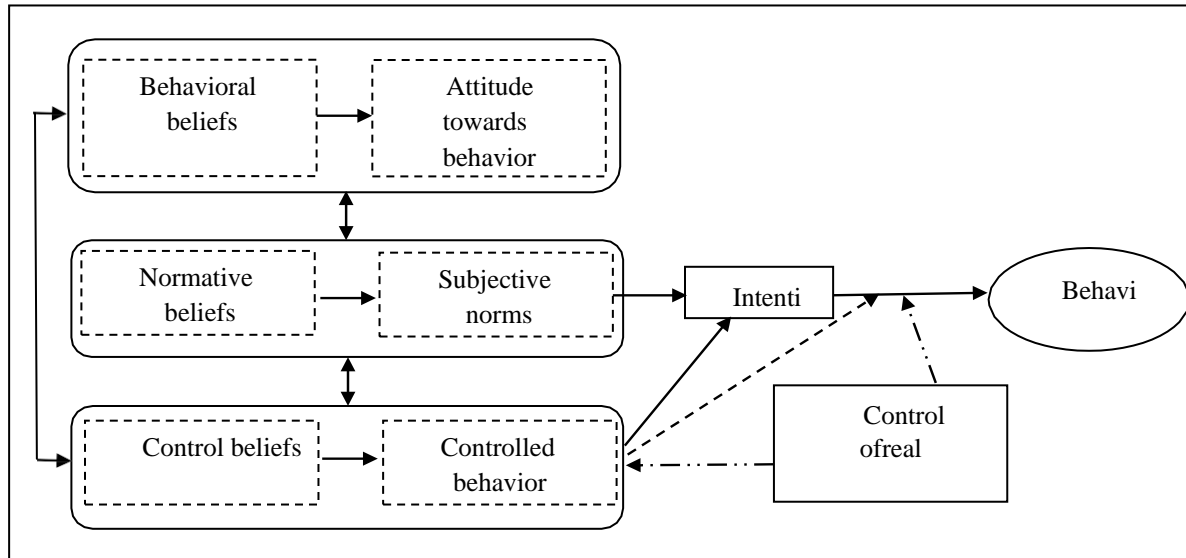
Figure 2: Theory of Planned Behavior (TPB)

Source: Ajzen (1991)

III. METHODOLOGY

This study employed a qualitative case study approach. The in-depth interview method was conducted between 6 experts in the field of fashion. Three of them are industry experts while three others were lecturers in the field of fashion design. The opinions and views of these experts in this study as they were active and keen in the fashion industry either in the fashion market or in terms of fashion design itself. The selection of the study participants was based on the ability and willingness of the respondents themselves to provide the information needed to answer the research question (Creswell, 2012).The selected research participants were all well experienced in the fashion industry, thus will be able to help answer the research questions while providing additional information for the study.

Validity and trustworthiness are important for qualitative studies (Lincoln & Guba, 1985; Merriam, 2009) where the issue of honesty (trustworthiness) is important in determining internal validity and external validity (Lincoln & Guba, 1985; Seale, 2002). Internal and external validity and reliability could be implemented in various ways including triangulation, peer checks, audit trail, member checks and so forth. The current study used member checks to determine the validity and reliability of the theme. The researcher reconnected with the study participants to confirm the findings. This process required respondents to examine the findings and interpret the prefixes to determine whether the findings are accurate and appropriate throughout the study (Merriam, 2009).

Sampling techniques

Purposive sampling technique was used to select the participants for in-depth interview sessions. This technique was chosen to select participants with characteristics and conditions that were predefined and individuals with extensive information in line with what needed to be studied (Patton, 2002; Merriam, 2009; Gall, Borg, & Gall, 2003 & Creswell, 2012). Therefore, the use of this technique can increase the degree of reliability. The study participants were also selected based on the ability, willingness and readiness of the respondents themselves, who were willing to provide information needed to help answer the research question. According to Armstrong, Parsons

and Barker (2000) and Powell (2003), the selection of expert panel was based on a number of criteria such as background, relevant work experience, willingness to contribute to the validity of the study, having diverse opinions, views and recent knowledge on the study.

In depth interview

An in-depth interview method was used in this study to gain expert insights on the factors that hinder the design and production of sustainable clothing with eco-friendly features. Six experts were interviewed for their opinions and insights as they were directly and practically involved with the garment manufacturing industry. The specialists consist of three individuals from the fashion industry while three others are lecturers in the field of fashion. Prior to the interview with the experts, several structured interview questions were developed for the use of the interviewer. Interview questions were then validated by three experts, content experts, linguists and field experts. The interview questions consisted of two sections, part A and part B. Part A is about sustainability in fashion while section B deals with consumer attitudes and behaviours in sustainable fashion. However, this article only describes the interview data for part A on the factors that hinder the design and production of sustainable and environmentally friendly clothing. These interviews were held live and took approximately one hour for each session with the expert.

Analysis Data

The data obtained from expert interviews were analysed manually. At the beginning, the interview data was transcribed into sentences by the researcher and performed simultaneously during the data collection process. Transcribed data were analysed to build categories and themes. The data obtained was compiled by reading repeatedly, hence, only relevant information regarding the research question was selected. Then a specific code will be set. All relevant data was encoded for selection and theme formation to ensure the code to be well structured and simplified for the researcher. Themes formed are named based on the relevant and suitable codes selected. The themes formed ascertain no overlapping and indirectly answer the research questions.

IV. RESULTS

The first findings of the study were the background of the study participants. The first industry expert was a company manager involved in manufacturing of products which wield jeans fabric (Expert 1). The second industry expert was a company manager who also produces products from used materials (Expert 2). His company is also involved in providing training and skills to people interested in the industry. The company has branches in every state in Malaysia, with 14 branches so far. The third industry expert was a fashion designer with a well-known fashion academy in the state of Selangor (Expert 3). She trains people interested in garment production and fashion design. She also produces a lot of sustainable clothing designs in using sustainable materials. The fourth expert is a lecturer with extensive experience in the field of fashion design and has 41 years of experience in clothing design (Expert 4). The fifth expert is also a fashion lecturer of a public higher education institution (Expert 5). She has 25 years of fashion designing experience. The sixth expert was also a lecturer in the field of fashion design (Expert 6). She has a wealth of experience in the field of fashion design and often does fashion research.

The findings showed that all participants in the in-depth interviews deduced that environmental pollution issues are engendered by the fashion industry which these issues are becoming more serious and perturbing. According to the Ryan Partnership of Chicago and Mambo Sprouts (2012), many consumers have trouble finding sustainable

clothing in the market. Therefore, it can be concluded that there are several factors which barriers are to produce sustainable clothing. The opinions and views of six experts in the field of fashion have revealed that there are four factors that impede the production and design of sustainable clothing with eco-friendly features. These include materials or resources, price, awareness and responsibility of the manufacturer.

Materials or resources

The first barrier is in terms of materials or resources to produce sustainable fashion products.

"…natural ingredients like indigo dye are not easily obtainable and are only accessible overseas. This will be a hindrance to manufacturers of clothing products using sustainable materials in fashion". (Expert 2)

"... the company is currently working with the Malaysian Handicraft to produce natural dye using local sources such as mangosteen and dragon fruit". (Expert 2)

"…When using natural materials, the design aspects of the clothing will be limited. For example, natural dye will cause the colour to be dull and will fade after being washed several times over a long period of time". (Expert 4)

4.2 Price

The second barrier is the price of sustainable fashion products which may be due to the high price of the natural material used and unavailability. Expert 2 added that ingredients like natural dye are a bit costly however if the manufacturers perceive and discern the benefits of using sustainable ingredients, then there would have no problem to produce them.

"... to produce something new certainly costs a lot of money because of the need to conduct research and so on." (Expert 3)

She also said that although fashion products are made with upcycle methods, high costs are required to produce them. Therefore, this will increase the price of sustainable fashion products.

"...When a clothing product is manufactured using natural dye, of course the product will be sold at a higher cost as the cost to get the natural materials is higher". (Expert 4)

Experts 5 postulated that fashion products made using natural sources are certainly expensive, but all these depend on the industry player. If an industry is environmentally friendly, it would still produce the product at a higher cost. There are several consumers will still purchase this kind of product at a great price. For example, real genuine cotton is quite expensive.

"... the cost of producing sustainable products is going to be high due to the cost of manufacture, but on the other hand, it is very good for our environment". (Expert 6).

4.3 Awareness

The third barrier is self-awareness from the manufacturers and consumers who employ the fashion products. Awareness means that fashion manufacturers and consumers are aware of environmental issues such as global warming, climate change, ozone depletion and such.

"… The industry should not just be imminent with new designs without thinking about the environmental impact. This shows that the industry has no awareness of the importance of protecting our environment today." (Expert 1)

Expert 2 pointed out that there is a need to cultivate a sense of awareness in the production of fashion products by being aware of its impact to our environment. Besides, Experts 3 said that the manufacturers' self-awareness is reflected when they employ the sustainable materials in fabricating their own fashion products. They should also be aware that the disposal of unrecyclable clothing will be detrimental to our environment.

"… If an industry has a high level of awareness, they will produce fabrics made from natural sources such as dye and so on. Clothing manufacturers can also use fabrics with higher percentage of cotton content instead of polyester if they have a high awareness of the importance of sustainability." (Expert 5)

While Expert 6 argued that companies such as batik manufacturers in Malaysia should be educated on awareness. Moreover, Expert 6 also questioned on how to elucidade the manufacturers on the use of dyes which made of chemicals that has high potential to harm the environment. Expert 6 suggested that therefore, we need to educate them in oder to create a greater awareness of the impact of the use of these chemicals to the environment.

4.4 Responsibility

The fourth limiting factor is the responsibility of the garment manufacturer or manufacturer. Experts 1 connoted that big companies should play their significant roles in upholding their responsibilities to the environment. These big companies will have a huge repercussion to the generation in the next 20 to 30 years.

"**…** It is the responsibility of the fashion industry and clothing manufacturers to produce fashion that can reduce environmental pollution. The use of sustainable materials in the process of manufacturing clothing products shows that the company values and respects our environment." (Expert 2)

"... *Designers also play an important role in carrying out environmental responsibility. Designers can create a variety of fashion styles and designs using upcycle methods with their creativity".* (Expert 3)

Experts 5 stated that the garment industry should be the most responsible for the environment. Apparently, the industry that produces fashion apparel should do fabric studies before producing garments. This is because consumers do not think twice or do research about materials, dyes and etc. when buying clothes. This is because consumers sometimes fail to weigh carefully and be cautious on the materials used, dyes and etc. when buying clothes.

"... *This sustainable responsibility is not just about materials for the production, it also considers the processes or labors involved in the production are not oppressed"* (Expert 6)

V. DISCUSSIONS

It can be inferred that there were several factors that impede the designing and manufacturing of sustainable clothing and eco-friendly features which have been identified from the conducted expert interviews. According to Kozlowski et al., (2018), the most difficult thing is to find and obtain information about suppliers that offer

sustainable raw materials. This had put more constraint on sustainable fashion brands to obtain the necessary supply of raw materials. Whereas according to Carneiroetal.(2016)one of the reasons why the concept of fashion sustainability is difficult to achieve is because of its very strong challenges. Moreover, among the challenges that need to be met are the rapidly changing apparel business paradigm, the offering of low-quality products at competitive prices, and more than 12 clothing collections being launched each year. These challenges are in stark contrast to the concept emphasized in achieving sustainable fashion. The writer also stated that many young consumers use fast fashion and are less concerned on the environment. There are also users who have a poor view of sustainable fashion. These consumers do not show a tendency to adopt sustainable fashion because they favor with fast fashion due to the lower price and attractive design.

A study by Razzaq et al., (2018), found that when more consumers are involved and aware of sustainable fashion, they will have lack of interest in buying fast fashion where these clothes are the biggest contributors to unsustainable fashion although considered less expensive and stylish. Consumers who are constantly involved in fashion are always looking for information on the clothing available in the market. Therefore, fashion awareness is not only important for manufacturers, but also the consumers of fashion itself (Arasinah, Farah Najwa, et al., 2017; Muh Fakhrihun et al., 2019). On the other hand, touching on responsibility, a study conducted by Wang, Liu, Jin, dan Hoon (2018), which aimed to measure the sustainable performance of fashion companies in retail and supply chain based on consumer ratings has used the ACSI (American Customer Satisfaction Index). This index will enable us to measure sustainable performance in retail and supply chains based on consumer evaluation and to build a constructive model that tests whether personal subjective appraisal influences sustainable behavior. The results have shown that managers of fashion companies should assess how customers perceive their sustainable behavior. Based on index scores, fashion companies can explain their detailed strategies on how to develop sustainability to impact profitability. Therefore, in line with SDG policy, the fashion and textile industry should play a role in minimizing the production of clothing and textiles that caused pollution while producing environmentally friendly products to achieve Sustainable Development Goals (Prinses,Baharudin&Toyong,2016;Arasinah, Farah Najwa, et al., 2018a).

VI. IMPLICATIONS AND SOLUTIONS

Consumers today were aware of issues on environmental pollutions and the need to adopt sustainable behavior in the use of clothing (Arasinah, Farah Najwa, et al., 2017a; Shim, Kim, & Na, 2018). Consumers were also making a strong demand for the industry to produce eco-friendly clothing. However, the problem is that consumers want these eco-friendly clothes at a cheap price(Žurga et al., 2015). Thus, the problem is solved when the industry is responding to consumers' demand for affordable eco-friendly clothing. Manufacturers as producers need to be accountable to both society and nature. It is necessary to ensure that all manufacturing process involving the use of raw materials, processing, and production of clothing do not impact the environment negatively (Deschamps et al., 2017; Rogers et al., 2018; Arasinah, Nornazira, et al., 2018a). The industry should also contemplate the Sustainable Development Goals (SDGs) planned by the UN as well as the NT50 aimed at raising awareness on the importance of sustainable living, environmental and infrastructure preservation globally. The sustainable fashion concept, rather than being shaped by facts or figures, is largely influenced by the direct experience of working in the fashion industry(Bly et al., 2015). Therefore, the

combination of sustainable practices in oder to reduce these issues will bring copious benefits to the future generations. The potential measures exist both at the industry and company level, as well as at individual consumer (Arasinah, Ridzwan, et al., 2017b; Rogers et al., 2018; Baity, Arasinah, Mohd Azlan, Mohd Bekri, & Sunaryo, 2019).

VII. CONCLUSION

It can be concluded that Environmental Education in the country has not yet achieved its objective of cultivating and nurturing community interest in applying what is learned in school to practice in their daily lives. Education Institutions are the key platform for facing future challenges. Education for sustainable development is essential in providing today's society not only for life and career but also contributes to sustainable nation building. Education can be regarded as significant and salient in changing behaviors and promoting critical thinking towards a more sustainable future. Education for sustainable development is the key to developing skills that will help the community realize that the path to sustainability involves economic, political and social aspects. While the productions of textile companies are raising concerned on the environment, partnerships between governments, industry and consumers are crucial to create effective solutions to environmental problems. A combination of sustainable practices to mitigate these issues will be very helpful for future generations. Potential measures exist at both the industry and the company level, as well as at individual consumer buying behavior. The enforcement and implementation depend mostly on the decision maker. Therefore, the authorities should also play their roles in the successful sustainable development of the country. For example, in United States has introduced increasingly stringent environmental protection standards for imported textiles, and environmental trade barriers which have been strengthened in this particular country.

VIII. ACKNOWLEDGEMENT

REFERENCES

[1] Ajzen, I. (1991). The theory of planned behaviour. *Organizational Behavior and Human Decision Processes*, vol.50, pp. 179-211.https://doi.org/10.1016/0749-5978(91)90020-T

[2] Akenroye, T. O., Nygård, H. M., & Eyo, A. (2018). Towards implementation of sustainable development goals (SDG) in developing nations: A useful funding framework. *International Area Studies Review*, *21*(1), 3–8. https://doi.org/10.1177/2233865917743357

[3] Arasinah, K., Farah Najwa, A. P., Rodia, S., & Emy, B. (2017a). Kelestarian tingkah laku melupuskan pakaian. *In Penyelidikan Dalam Sains Rumah Tangga*, 11–25.

[4] Arasinah, K., Farah Najwa, A. P., Suriani, M., Ridzwan, C. R., Baity, B., Rodia, S., & Emy, B. (2018b). Items' validity and reliability using Rasch Measurement Model for factors that Influence clothing disposal behaviour. *Indian Journal of Public Health Research and Development*, *9*(11), 1344–1353.

[5] Arasinah, K., Nornazira, S., Rahimah, J., Rodiah, S., & Fara Najwa, A. P. (2018a). Environmental sustainable apparel: Recycle, reparing and reuse apparel. *The International Journal of Social Sciences and Humanities Invention*, *5*(1), 4249–4257.

[6] Arasinah, K., Ridzwan, C. R., Shuhaila, N., & Farah Najwa, A. P. (2017b). Fesyen pakaian di manakah ianya berakhir? *In Penyelidikan Dalam Sains Rumah Tangga*, 1–10.

[7] Armstrong, A.E., Parsons, S., & Barker, P. J. (2000). An inquiry into moral virtues, especially compassion, in psychiatric nurses : Findings from a Delphi study. *Journal of Psychiatric and Mental Health Nursing,* 7(4), 297-306. doi: 10.1111/j. 1365-2850.2000.tb00202.x

[8]   Baity, B., Arasinah, K., Mohd Azlan, M. H., Mohd Bekri, R., & Sunaryo, S. (2019). Validity and reliability of Multimedia Interactive Making Clothes (MIMP) Module for Home Science Subjects. *International of Innovative Technology and Exploring Engineering (IJITEE)*, *8*(8), 593–596.

[9]   Bly, S., Gwozdz, W., & Reisch, L. A. (2015). Exit from the high street : an exploratory study of sustainable fashion consumption pioneers. *International Journal of Consumer Studies*, *39*(2), 125–135. https://doi.org/10.1111/ijcs.12159

[10]   Brundtland Report. (1987). In World Commission on Environment and Development. Our Common Future OUP.

[11]   Chen, H. L., & Burns, L. D. (2006). Environmental analysis of textile products. *Clothing and Textiles Research Journal*, *24*(3), 248–261. https://doi.org/10.1177/0887302X06293065

[12]   Creswell, J. W. (2012). *Educational research: Planning, conducting and evaluating quantitative and qualitative research* (4th ed.). Boston, MA :Pearson Education.

[13]   Deschamps, T. C., Carnie, B., & Mao, N. (2017). Public consciousness and willingness to embrace ethical consumption of textile products in Mexico. *Textiles and Clothing Sustainability*, *2*(1), 6. https://doi.org/10.1186/s40689-016-0017-2

[14]   Dickenbrok, C., & Martinez, L. F. (2018). Communicating green fashion across different cultures and geographical regions. *International Review on Public and Nonprofit Marketing*, *15*(2), 127–141.

[15]   Fletcher, K., 2008. *Sustainable Fashion and Textiles*: Design Journeys. London, Earthscan.

[16]   Gall, M. D., Borg, W. R., & Gall, J. P. (2003). *Educational research: An introduction* (7th ed.). White Plains, New York: Longman.

[17]   Haliza, A. R. (2017). Efforts and challenges in the application of environmental education in Malaysian school system. *Asian Journal of Environment, History and Heritage*, *1*(2), 61–70.

[18]   Huckle, J. & Sterling S. (1996). Realizing sustainability in changing times in education for sustainability. London: Earthscan Publications Ltd.

[19]   Kamus Dewan. (2002). Ed. Ke-3. Kuala Lumpur: Dewan Bahasa dan Pustaka

[20]   Kamus Dewan. (2007). Kuala Lumpur: Dewan Bahasa dan Pustaka.

[21]   Kozlowski, A., Searcy, C., & Bardecki, M. (2018). The reDesign canvas : Fashion design as a tool for sustainability. *Journal of Cleaner Production*, *183*, 194–207. https://doi.org/10.1016/j.jclepro.2018.02.014

[22]   Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry.* Beverly Hills, CA: Sage.

[23]   Mcneill, L., & Moore, R. (2015). Sustainable fashion consumption and the fast fashion conundrum : fashionable consumers and attitudes to sustainability in clothing choice. *International Journal of Consumer Studies*, *39*, 212–222. https://doi.org/10.1111/ijcs.12169

[24]   Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation.* San   Francisco: Jossey-Bass.

[25]   Morris, N. (2004). Sustainability: What is it? Power Engineer, 18(5), 11 Retrieved Oktober 10, 2009 from EBSCO host database.

[26]   Moon, K. K., Lai, C. S., Lam, E. Y., & Chang, J. M. T. (2015). Popularization of sustainable fashion : barriers and solutions. *The Journal of The Textile Institute*, *106*(9), 939–952. https://doi.org/10.1080/00405000.2014.955293

[27]   Muh Fakhrihun, N., Sri Endah, W., Erna, S., Wulansari, P., Arasinah, K., & Moh. Rusnoto, S. (2019). Riau Malay traditional clothes : Functional, symbolic, aesthetic, and cluster state studies. *International Journal ofRecent Technology and Engineering (IJRTE)*, *8*(1C2), 652–655.

[28]   Nor Kalsum, M. I. (2016). Pengetahuan ,sikap dan tingkah laku pelajar UPSI terhadapprinsip-prinsipkampuslestari*JurnalPerspektif*, *8*(1), 29–41.

[29]   Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). London, UK: Sage Publications

[30]   Pavlova, M. (2009). Technology and Vocational Education for sustainable development-Empowering individuals for the future. United Kingdom: Springer.

[31]   Pitt, J &Lubben, F. (2009). The social agenda of education for sustainable development within design &technology: The case of the sustainable design award. International Journal of Technology and Design Education, 19(2), 167–186.

[32]   Prinses, S., Baharuddin, U., & Toyong, N. M. P. (2016). Eco-Inclined fashion products; expressing the green quality through design lines. In *International Conference On Creative Media, Design & Technology (REKA2016)* (pp. 1–16).

[33]   Powell, C., (2003). The Delphi technique. Myths and realistics. *Journal of Advanced Nursing*, 19(6), 1221-1225. doi: 10.1046/j.1365-2648.2003.02537.x

[34]   Razzaq, A., Ansari, N. Y., Razzaq, Z., & Awan, H. M. (2018). The impact of fashion involvement and pro-

environmental attitude on sustainable clothing consumption : The moderating role of Islamic religiosity. *SAGE Open*, 8(2), 1–17. https://doi.org/10.1177/2158244018774611

[35]   Rogers, K., Olah, M., & Weber, M. (2018). Textile manager : Design and development of a persuasive game about sustainable textile production. In *Conference on Human Factors in Computing Systems - Proceedings*(pp.1–6).

[36]   Saha, I., Bhandari, U., & John Mathew, D. (2019). A study on consumer awareness towards green fashion in India. *Research into Design for a Connected World*, 134, 483–494. https://doi.org/10.1007/978-981-13-59743

[37]   Saricam, C., Erdumlu, N., Silan, A., Dogan, B. L., & Sonmezcan, G. (2017). Determination of consumer awareness about sustainable fashion. In *17th World Textile Conference AUTEX 2017 - Textiles - Shaping the Future* (pp. 1–7). https://doi.org/10.1088/1757-899X/254/17/172024

[38]   Seale, C. (2002). Quality issues in qualitative inquire. *Qualitative Social Work,* 1(1), 97-110.

[39]   Shen, B. (2014). Sustainable fashion supply chain: Lessons from H&M. *Sustainability*, 6(9), 6236–6249. https://doi.org/10.3390/su6096236

[40]   Shim, S., Kim, J., & Na, Y. (2018). An exploratory study on up‐cycling as the sustainable clothing life at home. *Fashion and Textiles*, 5(14), 1–15. https://doi.org/10.1186/s40691-018-0129-1

[41]   Wai Yee, L., Hassan, S. H., & Ramayah, T. (2016). Sustainability and philanthropic awareness in clothing disposal behavior among young Malaysian consumers. *SAGE Open*, 6(1). https://doi.org/10.1177/2158244015625327

[42]   Wang, H., Liu, H., Jin, S., & Hoon, K. (2018). Sustainable fashion index model and its implication. *Journal of Business Research*, (April 2017), 1–8. https://doi.org/10.1016/j.jbusres.2017.12.027

[43]   Žurga, Z., Hladnik, A., & Tavčer, P. F. (2015). Environmentally sustainable apparel acquisition and disposal behaviours among slovenian consumers. *Autex Research Journal*, 15(4), 243–259. https://doi.org/10.1515/aut-2015-0044