

# **ENTREPRENEURIAL RECYCLING INITIATIVES TOWARDS CAMPUS SUSTAINABILITY**

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## **ABSTRACT**

Recycling entrepreneurial initiatives can lead to campus sustainability and at the same time generates lucrative income amongst staff of higher learning institutes. The Higher Education Institute Entrepreneurship Development Policy aims to encourage and strengthen the development of entrepreneurship to be more organized and holistic among the local universities in Malaysia in producing high-quality human capital, with creative thinking, attributes, and values. Recycling is a practice to maintain campus sustainability and to generate income among the campus community. This study aims i) to increase knowledge and awareness of the campus community towards entrepreneurial initiatives in recycling, ii) to promote sustainable entrepreneurial initiatives among the campus community, and iii) to review the success factors and challenges faced by the recycling entrepreneurs at the university level. Questionnaires, interviews, and observation were used to gather data in this research. The findings indicate that organizing programmes that educate the campus community can open up the minds of the students and staff to the potential of recycling initiatives, increase their knowledge and awareness, and encourage innovation and creative thinking in the use of recycled materials. By applying the values of entrepreneurship, the staffs and students can generate income, and improve the preservation and beautification of the campus. However, challenges faced by the recycling entrepreneurs are: stealing of recycling items, recycling is considered as a non-glamorous job, lack of materials because the community is not practicing separation of garbage, lack of capital to expand and purchase the equipment due to lack of support from financial institutions.

**Keywords:** Entrepreneurial initiatives; Campus sustainability; Innovation and creativity; Awareness, Campus community.

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## 1. INTRODUCTION

Higher education institute is encouraged to implement steps to promote sustainable campus practices via a learning process that enables the development of attitudes and skills in thinking, integrating, synthesizing, and solving complex problems related to the challenges of sustainability (Stephen et al., 2008). Therefore, the university community should contribute to the transition towards sustainable development by teaching students to restructure, integrate, synthesis, and think systematically on how to deal with complex issues needed to meet the challenges of sustainability. One of the components which affects the sustainability of the university system, is education, which includes the development of entrepreneurship among students. To contribute to the creation of an integrated sustainable system, the university should be more concerned with sustaining the entrepreneurship aspects, not only for education, but also for the whole university operations.

From the university's operational aspect, operational policies that emphasize the importance of sustainability are the most important aspect in achieving campus sustainability (Wright, 2002). This policy includes prioritizing businesses and suppliers who practice sustainability in the day-to-day affairs to promote the existence of sustainable entrepreneurs. One of them includes recycling entrepreneurship, which is the best solution in managing waste in the institution. Local communities comprising the alumni, businesses, resource suppliers, community organizations and professional associations can provide a variety of resources to help sustain entrepreneurship towards building a sustainable campus.

Sustainable entrepreneurship is a business concept based on sustainability that focuses on social and environmental improvements and businesses that are treated as shared values (Fischler, Weidinger and Schmidpeter, 2014). According to Dollinger (1995), the existence of entrepreneurs is not a new phenomenon. Entrepreneurs have emerged and existed throughout the course of history, but their concepts and practices in the past and present are different in terms of creation and exploration. In Malaysia, the Institute of Higher Learning Entrepreneurship Development Policy was formulated to promote and strengthen the local entrepreneurial development institutions to be more holistic and structured to produce quality human capital with thoughts, attributes, and values (Department of Higher Education, 2017).

There are two forms of recycling business activities. First, new goods can be produced through the collection and processing of recyclable materials obtained from home and business premises. Second, it is operated by a large company with machines and expertise in the processing of recyclable materials. Additionally, this recycling business activity is beneficial in terms of environmental management (Yaacob, 2012).

The study by Norfadillah et al. (2012) found that the level of awareness and the role of staff in sustainability was 60% higher than students based on the involvement and willingness to engage in sustainability activities with the out of campus communities but were less prepared to manage sustainable development activities and programmes for the university community and the out of campus community. In addition, there are problem of stealing of recyclable items, fluctuating market price, community perceptions of recycled and glamorous recycling businesses, and lack of materials because communities do not practice waste segregation for recycling (Yaacob et al., 2012). A study on recycling entrepreneurship among UKM students and staff should be undertaken to identify the level of involvement through observation of the collection and sale of recyclable

materials programme. The understanding and knowledge of the benefits of recycling entrepreneurship among students can be measured through their involvement in the campus recycling businesses, lucrative income generated and the preservation of the higher learning institutions through environmental care. Therefore, a programme under the Research Project Grant AP-2014-022 was conducted involving the students and staff of UKM, namely Campus Sustainability Entrepreneurship. The objectives of this programme:

- i. To increase knowledge and awareness of the campus community towards sustainable entrepreneurship;
- ii. To promote sustainable entrepreneurship among the campus community;
- iii. To review the success factors and challenges faced by entrepreneurial recyclers at the university level.

## **2. LITERATURE REVIEW**

Entrepreneurship is an important component in the growth of a country. According to Loon (2015), entrepreneurship is referred to as the engine of economic growth by many researchers in relation to wealth generation, competition, and economic growth. Entrepreneurship is believed to be able to bring a sustainable paradigm shift or transition to a business, transform the business orientation of the non-profit basis of sustainability, transform the focus of shareholders to all stakeholders, and transform the way business is conducted and the significant impact on the economy, social, and environment. The challenge facing the State and Michigan municipalities is how to increase recycle programme efficiencies and provide a cost-effective programme that can be embraced by its residents and businesses (Resource Recycling Systems Consultant (RRSC), 2016). According to RRSC (2016), the new generation companies in Michigan has applied the concept, called Incentive Based Recycling, to increase recycling rates by providing a direct financial incentive for people to go through the trouble of sorting their garbage. In addition, participating customers receive a 35, 64 or 96-gallon container that has a barcode that identifies their home. As the truck collects the recyclables, it scans the barcode on the container and translates the value of the recycled items in dollar amount that can be redeemed through shopping coupons at participating businesses (RRSC, 2016). Business activities related to the collection of recycled materials can contribute to the sustainable development in Malaysia (Yaacob, 2012).

Many studies have shown that entrepreneurial business activities have contributed to the environmental degradation caused by failures in the market (Cohen & Winn, 2007). Based on this situation, business practitioners are prompted to play a more active role in resolving issues related to the environment. Loon (2015) reiterates the statement of Palazzi and Starcher (1997) that combines the importance of the environment in creating interest and value to the entire community, which is increasingly important nowadays. Entrepreneurship is associated with the concept of sustainable development and discussed by various schools of thought and literature such as eco-entrepreneurship, social entrepreneurship, and sustainable entrepreneurship. In the field of scientific research, sustainable entrepreneurship topics are regarded as something new, developed only in the past decade, with just a few studies referring to the field of sustainable development and entrepreneurship prior to the year 2002 (Hall, Daneke & Lenox, 2010). It was introduced as a new discipline, which uses entrepreneurial activities to resolve issues related to the sustainability agenda to create social and environmental sustainability as a strategic objective.

Recycling is the process of manipulation of waste materials in producing new goods. Recycling can reduce waste, the use of new raw materials, energy usage, air pollution (from burning), water pollution (from landfills) and the production of greenhouse gases compared to the production of new goods from raw materials (Murphy, 1993). According to the Public Solid Waste Cleansing Management Act 2007 (Act 672), recycling means recovering and separating waste for producing an output. Recycling changes the ingredients that should be a waste into valuable resources. In addition, it is becoming a resource for environmental, financial, and social benefits. Materials such as glass, metal, plastic and paper are collected, separated, and sent to the processing centre to be converted into new products or materials. Therefore, recycling entrepreneurs can be defined as any money-earning individual, which employs an enterprise that contributes to the activity of recycling of any solid, liquid, or gas (Yaacob, 2012).

Although the recycling industry is still debatable in the eyes of the society, the advantages of a recycling business in the generation of the clear economy have proven to be providing high returns to on-site recycling. For example, a female millionaire from China, Zhang Yin, who is involved in the recycling business, has raised assets amounting to 11.71 billion yuan. She is the first richest woman in China with personal assets collected through the recycling business (Zaini et al, 2008).

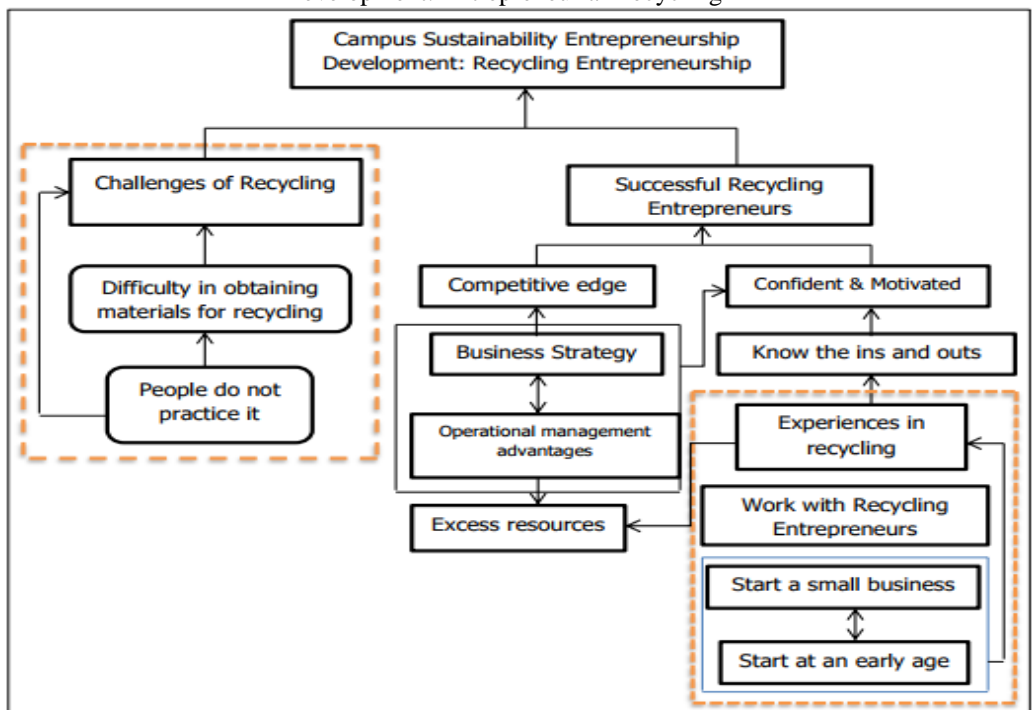
The development of campus entrepreneurship among students is also highlighted by the Institute of Higher Learning Entrepreneurship Development Policy, which aims to promote and strengthen the development of a more holistic entrepreneurship among the local higher learning institute in order to produce quality human capital and who has the entrepreneurship thinking, attributes and values (Department of Higher Education, 2017).

In developed countries, sustainable entrepreneurship is considered as an increasingly important practice in a business. Small and Medium Enterprises (SMEs) are identified as drivers for innovation, entrepreneurial spirit and completion, and thus are seen as among the key factors in achieving sustainable development. The study by Kardos (2012) in the European Union states shows that SMEs also play major roles in contributing to the sustainable development of a country. At the same time, developing countries (and their businesses), though relatively slow, have moved towards environmental sustainability. Malaysia's commitment to sustainable development can be seen as an integrating sustainable management on the government agenda, such as the 10<sup>th</sup> Malaysia Plan and the implementation of the National Green Technology Policy (Loon, 2015). Nevertheless, the number of business firms involved in the sustainability management in Malaysia is still relatively low, although various efforts have been made by the Government to promote sustainable entrepreneurship (Loon & Izaidin 2014). Although SMEs account for 99.2% of business establishments in the country (Loon & Izaidin, 2014), there is a lack of information regarding environmental reporting. The recycling industry in Malaysia may be able to thrive in the future through the support of all relevant parties, i.e. community, government and non-governmental (NGOs) agencies, in enhancing education, promotion, technological advancement, improvement of existing policies, and investment to generate income.

### 3. CONCEPTUAL FRAMEWORK

The conceptual framework as shown in **Figure 1.0** was developed from two models, namely the Model of a Recycling Entrepreneur - the success factors of recycling (Yaacob, 2012) and the Model of Challenges of Entrepreneurial Recycling (Yaacob et al., 2012). The key success factors of the recycling entrepreneur in the model reveal the determinants of entrepreneurial success in the recycling business. These factors are experienced in the recycling business; its advantages are in terms of resources (spacious premises, sufficient number of staff, purchase of expensive equipment, capital, business strategy, and operations management (Yaacob, 2012).

**Figure 1.0:** The Conceptual Framework of Campus Sustainability Entrepreneurship Development: Entrepreneurial Recycling



For this study, the researchers studied the experience factor in the small-scale recycling business including the collection of waste such as metal, papers, plastic bottles, and others (in the context of the university). In addition, work experience or dealing directly with recycling companies also help to improve knowledge about some of the challenges of the business activities. In other words, starting a small business from the initial stage is a valuable experience and can become a contributing factor to the success of entrepreneurs in recycling. It is suitable for students to perform recycling to obtain additional income and to help them financially in the university, as well as for the staffs to generate additional income.

Entrepreneur Recycling Challenge Model highlights the challenges faced by the entrepreneurs with recycling capital to some extent: there is difficulty in recruiting the local workers, difficulty in obtaining recycle materials, local authority approvals, difficulties in obtaining license from the police, and increased competition (Yaacob et al, 2012). This study examines the challenges of the difficulty in obtaining materials for recycling and those that are not recycled.

#### **4. DATA COLLECTION**

In order to increase knowledge and awareness of the campus community and to promote sustainable entrepreneurship among them, the Eco Green Campus Challenge Programme was conducted in the Faculty of Social Sciences and Humanities (FSSK), Universiti Kebangsaan Malaysia (UKM). In addition, the success factors and challenges faced with entrepreneurial recyclers at the university level have been reviewed through this programme.

Purposive sampling was used for the selection of respondents. The use of this sampling method is in line with this study whereby the samples selected were the participants involved in activities organized under the Campus Sustainability Entrepreneurial Sub-programme: Entrepreneurial Recycling. 26 respondents were selected via purposive sampling. The primary data source was derived from the results of fieldwork using three methods of information gathering namely questionnaires, interview and observation. On the other hand, the secondary data were obtained from the existing reference resources such as thesis, journal articles, proceedings, books, and other related materials. Data collected were interpreted in terms of percentages and presented in the form of tables and graphs.

#### **5. RESULTS AND DISCUSSIONS**

Campus Sustainability Entrepreneurial Sub-programme: Entrepreneurial Recycling was one of the sub-programmes implemented under the Eco Green Campus Challenge (EGCC). This programme is an eco-green entrepreneurial programme involving the recycling and reuse activities. The programme involved the staffs and students from various faculties in UKM. The selection of this faculty is very well suited to the programme organized as the faculty is located at the centre of the UKM's main campus and adjacent to the PUSANIKA Building which is the central place of many students and UKM staff.

##### **5.1. *Activities Conducted***

Campus Sustainability Entrepreneurial Sub-programme: Entrepreneurial Recycling was designed to attract and ensure that the students and staff of UKM were involved in the following activities implemented during the programme:

- i. Competition on designing recycled material
- ii. Sales of recycle materials to the Pusat Kitar Semula UKM (PKSUKM)
- iii. Sales of used reading materials

## 5.2. Analysis of Activities

### 5.2.1. Background of Respondents

Based on the respondents' profile, the highest number by age group of respondents is 15 respondents (57.69%) for the group aged between 20 to 29 years old (refer **Table 1**). This is followed by nine (34.62%) respondents who are in the age group of between 30 and 39 years. The group with the age of 40 years old and above is the lowest, with two respondents (7.69%). The number of young adults (20 to 29 years) indicates that this study achieved its target objective of focusing on the success factors of successful entrepreneurs with experience in the business of recycling with the emphasis of experience starting from an early age. This strengthens the success factors of producing successful entrepreneurs in recycling.

**Table 1:** Profile of the Respondents

Criteria	Number (person)	Percentage (%)
<i>Age</i>		
20-29 years	15	57.69
30-39 years	9	34.62
40 years and above	2	7.69
<i>Gender</i>		
Male	9	36.62
Female	17	65.38
<i>Race</i>		
Malay	23	88.46
Chinese	1	3.85
India	1	3.85
Others	1	3.85
<i>Status</i>		
Staff	8	30.77
Student	18	69.23

In terms of gender, 17 respondents (65.38%) are female, and nine respondents (34.6%) are male. In terms of race, majority of the respondents are Malay with 23 respondents (88.6%), followed by one respondent each who had the same percentage (3.85) namely Chinese (3.85%), Indian (3.85%), and other races (3.85%) respectively. Meanwhile, in terms of employment, the number of respondents is 26 people consisting of 18 respondents (69.23%) who are students and eight respondents (30.77%) who are staff. This finding proves that the programme received higher participation from the students than the staff. This indirectly proves that the success factor of entrepreneurship recycling can begin at a young age. In addition, entrepreneurship nurtured for UKM students through this programme is effective in opening up their minds to engage the recycling entrepreneurial industry after they graduate from the university. Meanwhile, for the staff, this exposure gave them the opportunity to explore the recycling entrepreneurial field in terms of activities performed, revenue collection, sale proceeds and profit and loss, and others. Indirectly, this demonstrates that experience in recycling is a contributing factor in achieving success as an entrepreneur in recycling as described through the Determinant Factors of Success in Recycling Entrepreneurs Model.

### 5.2.2. Factors Determining Entrepreneurial Success – Experience in The Recycling Business

Competition on designing recycled materials, sales of recycled materials to PKSUKM, and sales of used reading materials were the activities undertaken to prove the recycling entrepreneurs' success factors surveyed in this study i.e., experience in the business of recycling. Competition on designing received six entries, comprised of three individual entries and three group participations. Of the total, two participants (17%) were the staff of UKM and 10 participants (83%) were students. This finding showed that the participation of students was higher than the staff.

**Table 2:** Sales of recycled materials

Category	Recycled materials	Price (RM)	Weight (kg)	Sales Value (RM)
Paper	Black and white paper	0.30/kg	40.4	12.12
	Mixed paper (books, magazines, paper, coloured)	0.15/kg	262.8	39.42
	Newspapers	0.15/kg	9.4	1.41
	Box	0.15/kg	71.2	10.68
	<b>Total</b>		<b>383.8</b>	<b>63.63</b>
Plastic	Transparent plastic bottles	0.50/kg	38.4	19.20
	Plastic mixture 1 (coloured plastic bottles)	0.40/kg	46.4	18.56
	<b>Total</b>		<b>84.8</b>	<b>37.76</b>
Aluminium and iron	Aluminium 1 (aluminium cans)	2.40/kg	32.2	77.28
	Aluminium 2 (others)	3.00/kg	7.6	22.80
	Iron 2 (other metal)	0.30/kg	18.4	5.52
	Iron 3 (canned food)	0.20/kg	0.4	0.08
	<b>Total</b>		<b>58.6</b>	<b>105.68</b>
Electrical & electronic products (E&E)	Electrical goods	0.30/kg	6.2	1.86
	Car battery	10.00/units	1 units	10.00
	<b>Total</b>		<b>6.2</b>	<b>11.86</b>
Cooking oil	Used cooking oil	0.40/kg	<b>24.0</b>	<b>9.60</b>
<b>Total</b>				<b>RM228.53</b>

Meanwhile, sales of recycled materials shown in **Table 2** amounts to RM228.53. The recycled materials comprised of paper, plastic, aluminium, steel, electrical and electronic products, and cooking oil. Paper is the most widely sold recycled material weighing at 383.8 kg (69%) followed by plastic (84.8 kg or 15%), aluminium and iron (58.6 kg or 11%), used cooking oil (24 kg or 4%), and electrical and electronic (E & E) products (7.2 kg or 1.0%). In terms of sales value, the value of sales of aluminium and iron is the highest (RM105.68), followed by paper (RM63.63), plastic (RM37.76), E&E products (RM11.86), and used cooking oil (RM9.60). Proceed of sales from used reading materials are presented in **Table 3**. The highest reading materials are scholarly and informative magazines such as Discovery and Time magazine compared to other magazines that attracted many buyers from various ages. The sales price per reading materials is different and not uniform due to the quality and limited edition of a book. The comics were sold at RM2.50 each,



and other academic magazines were sold at a price of RM1.00. The overall profit from selling used reading material is RM78.00 inclusive of discounts for bulk purchases.

**Table 3: Price of Used Reading Materials and Counting Sales Volume**

Type of reading materials	Sale price (RM)	Number of sold units	Total (RM)
Malay novel	2.00/item	2	4.00
English novel	5.00/item	5	25.00
Comic	2.50/item	8	20.00
Congruent	1.00/item	29	29.00
<b>The total amount</b>			<b>RM78.00</b>

In conclusion, the results achieved from the competition on designing recycled materials, sales of recycling materials to PKSUKM, and sales of used reading materials have nurtured the participants' (students and staffs of UKM) experience in the recycling business. Moreover, the results demonstrated that experience in the recycling business is one of the factor that has contributed to the success of entrepreneurial recycling as shown in the conceptual framework by the researchers.

#### 5.2.3. *Experience in Working with Recycling Entrepreneurs*

During the EGCC programme, three students helped the PKSUKM in executing the highest sales activities of recycled materials. They assisted in the provision of the site for sales activities of recycled materials, considered the recycled materials, calculated the amount of sale, issued the receipts, and deal with the buyers of recycled materials. All these activities provided experience to the students in the recycling business that is considered less popular, contemptuous, dirty, and others. Indirectly, this experience can broaden the students' minds about the recycling entrepreneur business and nurture the aspect of "working as a recycling entrepreneur", which is a factor in the model for entrepreneurial success determinants in the recycling framework conceptualized by the researchers.

#### 5.2.4. *The Beginning of A Small Business*

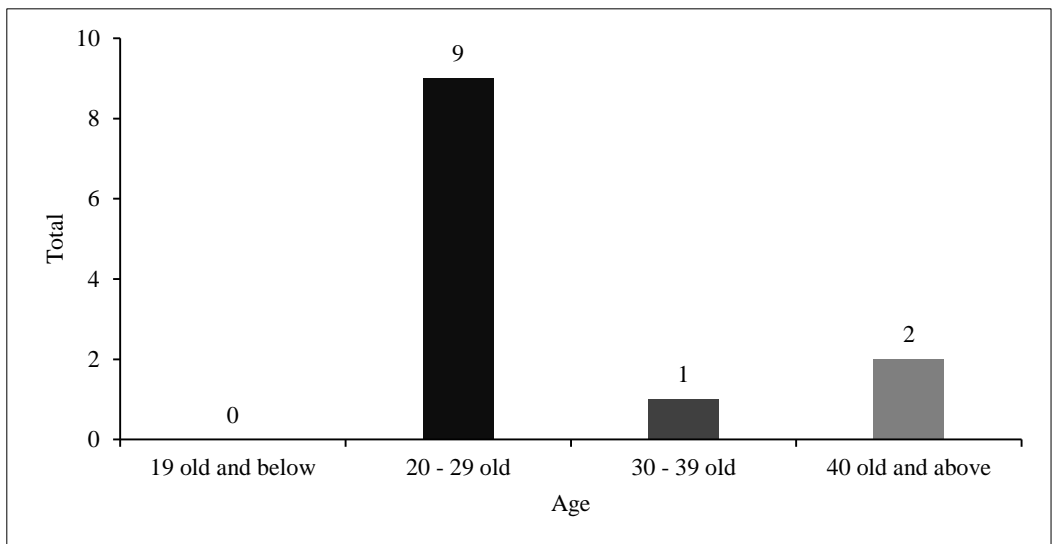
Sales of used and applicable reading materials were carried out by three participants who are the students of UKM. The results showed that participation in this activity was dominated by the UKM students at 100% of the total participation. This indirectly indicates the initial aspect of a small business conducted during the EGCC in cultivating university students' "interest in small businesses with sales of used materials". It also answers the aspect of "starting a small business" in the model for entrepreneurial success determinants in the recycling framework conceptualized by the researchers.

#### 5.2.5. *Starting at An Early Age*

The results of the competition entries are inventions based on the age of the participants. **Figure 2** shows the graph of participants' age during the invention. The highest number of participants is in the age range of 20 to 29 years, a total of nine people or equivalent to 75% of the total participants.

This is followed by the age of 40 years old and above with two participants or 16.67% of the total participants and one participant in the age range from 30 to 39 years or 8.33% of the total participants. This graph shows that the competition's intention to attract more participants aged between 20 to 29 years old is successful as there are more students compared to the staff of UKM. As many as 75% of the entries are from those age range of 20 to 29 years old and 8.33% in the age range of 30 to 39 years old. This indirectly shows that the outcome of the participation has already addressed the aspects of "start at an early age" studied under "experience in the business of recycling".

**Figure 2: Participants' Age During Invention**



### 5.3. *Recycling Entrepreneur Challenge*

#### 5.3.1. *Difficulty in Getting Recycling Materials*

Results of the interviews conducted on the 26 participants, staff and employees of PSKUKM discovered that 20 respondents (76.9%) agreed with the statement of "there are difficulties in obtaining the recycling materials". The remaining four respondents (15.4%) were not sure and two respondents (7.7%) disagreed with this statement. This study indicates that the difficulty of obtaining materials for recycling is one of the challenges of entrepreneurial recycling and this is in line with the researchers' conceptual framework.

#### 5.3.2. *The Public Who Do Not Practice Recycling*

The results of interviews conducted on the 26 respondent participants, staffs, and workers of PKSUKM showed that 21 respondents (80.8%) agreed with the statement of "those who do not recycle". Meanwhile, three respondents (11.5%) were not sure, and two respondents (7.7%)

disagreed with the statement. According to the workers of PKSUKM, the number of students and staff who sent the recycle materials to PKSUKM for sales on any other day was relatively low.

### 5.3.3. *Deciding the Success Factors of the Model for Recycling Entrepreneurs*

Experience in the recycling business is a contributing factor towards the success of entrepreneurs in recycling. This can be seen through the revenue earned through the activities undertaken such as competition on designing recycled materials, recycling materials with the highest sale, and sales of used reading materials. All these activities were intended to nurture the experience of the students and staffs of UKM in the recycling business. This can be shown in the invention contest by the participation that achieved its 100% target. Sales of books or reading materials reached a profit of RM78.00 from old books that could not be used again, while the total sales of recycled materials also exceeded the target of RM228.53 and this was achieved only within the last five hours of sale.

In addition, the aspect on “start at an early age” is an aspect of the review under the “experience in the business of recycling” and it is supported by the results of the overall review of the activities carried out. Young participants in the age range of 20 to 29 years old involved 15 respondents (57.69%), while those in the age of 30 to 39 years old involved 10 respondents (34.62%). For competition on designing recycled materials, there were nine respondents (75%) in the 20 to 29 years old age group, and only one participant (16.67%) from the age range of 30 to 39 years old took part in this competition. With this, the aspect of “start at an early age” has been answered. On the other hand, for sales of recycled materials to PKSUKM, the age group of 30 to 39 years old (54.5%) and the age group of 40 years and above (45.5%) took the opportunity to carry out and manage recycling business compared to none from the younger generation.

### 5.3.4. *Model of Challenges in Entrepreneurial Recycling*

Recycling Entrepreneurs Challenge model is the model used to identify the challenges of recycling entrepreneurs. The difficulties in obtaining recycle materials and people who do not practice recycling are challenges seen in this model. The results showed that there are difficulties in obtaining recycle materials with 76.9% of the respondents agreed with this statement. Through interviews and observations made, there were participants who stated that they are struggling to get recycle materials in the highest sales activities of recycle materials. In addition, 80.8% of the respondents also agreed that people who do not practice recycling activities pose challenges to the recycling entrepreneurs.

## 6. CONCLUSION

Entrepreneurial development in recycling provides education and awareness to students and staffs of UKM regarding caring for the environment, being capable of creating a side income, and thus ensuring the well-being of a more holistic campus community. Organizing recycling entrepreneurship programme is justified throughout the campus. The involvement and cooperation provided by the campus community is capable of creating an environment that is conducive and society that appreciates the environment through practicing recycling. In addition, recycling activities are essential in preserving the natural resources for future generation. It is also capable of reducing the use of raw materials and uses little energy compared to the processing of materials

from natural resources. Thus, the protection of the environment provides benefits for the future generation.

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