

Food waste warriors: Indonesian communities engage through workshops and social media education

Monica Audrey, Elisabeth Rukmini

Department of Food Technology, Faculty of Engineering, Bina Nusantara University, Jakarta, Indonesia

Article Info

Article history:

Received Jul 20, 2023

Revised Aug 28, 2023

Accepted Sep 7, 2023

Keywords:

Community

Education

Food waste

Social media content

Sustainable development goals

Workshop content

ABSTRACT

Food waste is food appropriate for human consumption but discarded in the retail or consumption process. In 2022, food waste accounts for 40.9% of Indonesia's waste composition. Therefore, food waste community education is critical for reducing food waste. Community education can reach the young generation through workshops and social media. This research aims to evaluate various workshops and social media content in educating teenagers about food waste through community. The PRISMA guidelines become the foundation as a contribution to Sustainable Development Goals. We utilized databases such as EBSCO Host, SAGE, Taylor & Francis, and Wiley Online Library to search for relevant studies. This study's approach is normative research including secondary data, comprehensive literature review such as workshops, social media, and food waste education journals in Indonesia. This systematic review examines food waste education content of workshops and social media in Indonesia also further content recommendations. This systematic review collected 52 papers, including journals and proceedings. The community education content in Indonesia focuses on recycling with 28.57%. Seminars/online campaigns dominate the education form with sustainable development goals (SDGs) achieved: climate action and zero hunger. This systematic review showed that it is essential to add actions toward food waste in the form of actual activities.

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Corresponding Author:

Elisabeth Rukmini

Department Food Technology, Faculty of Engineering, Bina Nusantara University

Jakarta, Indonesia

Email: Elisabeth.rukmini@binus.ac.id

1. INTRODUCTION

Food waste is an environmental issue that refers to discarding edible foods at retail or consumer levels, especially in developed countries due to the market condition and consumer eating behavior. Food waste is a crucial worldwide problem because the accumulation of food waste in landfills has the potential to produce methane gas from its anaerobic reactions. This is detrimental to the ozone layer and causes global warming. The quantities of food loss and waste on a global scale are 1.6 billion tons annually [1]. According to the World Bank analysis from 2016, food waste is largely wasted in both East Asia and South Asia at about 53% and 57% respectively. In Indonesia, food waste occupies 41% of the country's total waste and produce 12.89 million tons of waste every year in 2022. This high waste generation is unbalanced with good waste management and reduction, for the waste accomplished to reduce is only 18.21% [2]. Therefore, community education about food waste has become a crucial component in reducing food waste. As technology advances, this food waste education is unlimited across regions and easily accessed via the internet. The workshop and social media content must be considered in order to reach more audiences, especially teenagers [3].

The previous research focuses on formulating recommendations for Indonesia's food waste proper handling. In this research, the researcher collected data by distributing forms to public respondents and from students writing with reference to food waste video for obtaining students respondents' data [4]. This research recommends community education as one of the ways to improve consumer habits since the audience can gain knowledge and experience from it. Community advertising and success story spread potentially occur to improve audience comprehension regarding food waste [4]. Other research found that offline workshops and online campaigns through social media can engage several audiences to raise their awareness [5]. This is also done through community development programs. In this program, participants understand how to recycle their food waste and be more responsible towards their waste also able to use commercial eco enzymes. Furthermore, it attracts and engages more participants in contributing to reducing food waste [5]. Another research has shown that the researcher educates several communities in Bekasi such as partners, traders, small- and medium-sized enterprises (MSMEs), and society through workshops on making liquid organic fertilizer (POC). The methods are including observation and training [6]. Training in food waste processing aims to raise public understanding of food loss and waste, as well as the ability to process organic and food waste autonomously. Community cooperation, monitoring, and evaluation are further methods after training to achieve sustainable daily life [6]. Other research regarding food waste campaigns on social media reveals that the content is commonly warning and advisory information [7]. The participants are exposed to a sense of awareness and sympathy from the campaign content. The campaign employs the use of graphics and titles, as well as standard language in message delivery, to ensure that all groups grasp the message [7].

Nevertheless, the first research barely discusses community education food waste content, or the community advertising content [4]. It only focuses on public opinion about food waste and the recommendation for food waste handling. The data analysis also relies on the dependability of respondents by using questionnaire forms filled out by specific respondents [4]. This can result in invalid data if the respondents do not perform properly, and the community target is too wide. It also has not discussed social media as a potential method to reduce food waste. Contrary to the first research, the second research shows workshops and social media content regarding food waste [5]. Although it discusses both methods, there are several crucial contents that have not been listed in the online campaign. One of them is displaying numbers or percentages of Indonesia's food waste which can increase audience awareness about food waste since they are aware of how this issue is to their daily life. The third research has a similar deficiency to the first research which is social media consideration to reach more audience and there is no further explanation in the evaluation result [7]. The gap in the last research is mainly because the solution given in the content is not varied enough since it is more focus on warning and advisory information [7].

The content in community education regarding food waste is essential since it is the key factor to attract the audience. The content includes the appearance of social media posts since it will catch the audience's attention for the first time. This should be a consideration for previous research. The target audience also can be specified, for example, teenagers. Owing to the fact that 89.7% of internet users in Indonesia are students and 97% of internet users have accessed social media content [8]. Therefore, the workshop and social media content can be specialized for teenagers. Furthermore, the data about Indonesia's food waste reveals quantitative (number) and put references to increase the reliability of the content. Social media utilization for the workshop content to reach more audiences and spread awareness in a broader area since information dissemination on social media is rapid. Workshop and social media content must include various activities which can be followed by the audience. It is preferable, to begin with a simple task that is meaningful for food waste reduction in Indonesia. Thus, the outcome will be more impactful since there is a higher chance for participants to continue doing those activities in their daily life. In designing the content, it is required for a content creator to also follow the recent trends. The trends can be applied to the content delivery method, recent color palate, and trendy images or short videos. Besides trendy content, it is important to be informative and persuasive. Informative such as content regarding expiration dates to prevent food waste at the consumer level. As a consequence, the audience will have broader insights about food waste and how to reduce it. Persuasive content can motivate the audience to contribute to reducing food waste. Social media helps the content creator and audience to share information in a quick way. It can contribute to the food waste workshop which requires plenty of media partners, sponsors, and audience. All of them depend on how the food waste education content is built in the community.

Based on the information presented above, Indonesia contributes a numerous amount of food waste. Additionally, several prior studies on food waste indicate that this issue requires immediate attention. According to the first research, community education is potentially improving consumer habits such as community advertising and success story dissemination in workshops. Then it discovers that physical workshops and online campaigns through social media can engage a variety of audiences and raise their awareness through community development programs such as commercial eco enzymes. The results indicate that the audiences have understood the food waste issue, however, the motivation to act for reducing food waste must be developed so it will sustain. These researchers have several drawbacks in their research. The first

research can not determine the application of specific content and respondents' reliability, the second does not include crucial information in their content, the third does not provide a thorough explanation of the evaluation result, and the solutions given in the last research have not varied enough. Adding social media content can complement another method such as workshops to accelerate the dissemination of information, especially to empower teenagers since they dominate social media users and are the nation's next generation. Therefore, this research aims to evaluate various workshops and social media content in educating teenagers about food waste in Indonesia by community.

2. METHOD

From the 4 databases, there were 71 articles imported into the Zotero software as the record identification. The first screening is done by checking the duplicate articles. In this screening, there were 2 articles duplication. After the first round of screening, there remain 69 articles. Reading the research objective, location, and sample of the article served as the second screening. There are 17 papers that were removed from this systematic review because they failed the quality evaluation. This is due to the research sample was not teenagers, not conducted in Indonesia, and the majority of them were from foreign nations and therefore too broad. These papers were disqualified because they did not support our research's focus on Indonesia and teenagers. Following the second screening, a total of 52 items remained. Figure 1 shows the PRISMA flowchart for this systematic review [9].

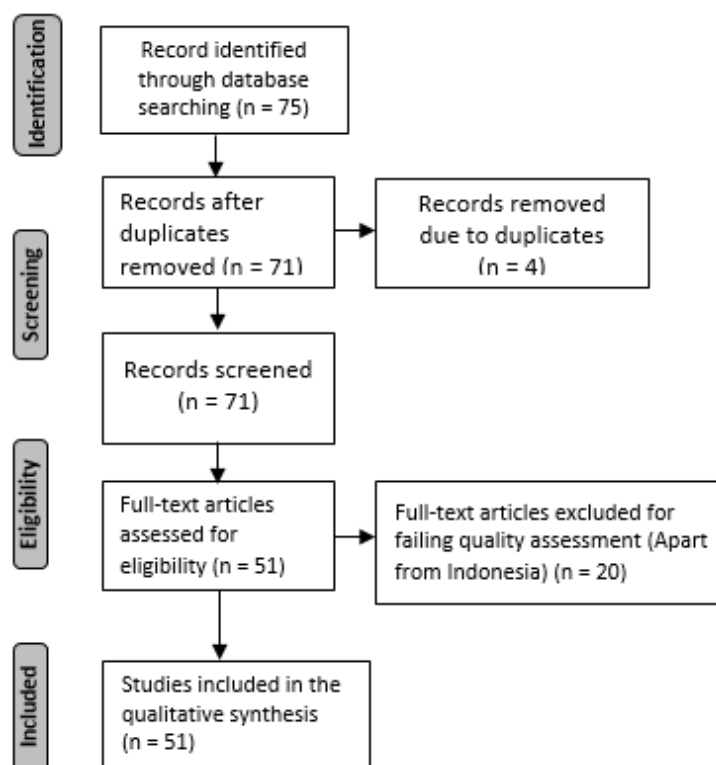


Figure 1. PRISMA food waste community education content in Indonesia

3. RESULTS AND DISCUSSION

Based on Figure 2, recycling is the most applied content with a percentage of 28.57% because the implementation is easier to do, and the researcher can have a direct result. Workshops as one of the food waste education forms, often using recycling content to persuade the participants in managing food waste [10]. This recycling content is divided into two major contents such as turning the food waste into compost or recycling it into edible foods. Previous research also uses the sorting method before turning the food waste into compost [11]. In the article's findings, it is shown that recycling food waste into compost content is more common than recycling it into edible foods. This is very unfortunate because food waste can be developed more than just composted. Therefore, food waste community education requires more various recycling content such as

making food waste into foods that can be consumed. The utilization of fruit peels is a great choice since Indonesia produces numerous amounts of tropical foods, this waste can be processed into candied orange peel, candied dragon fruit skin, and shredded papaya skin (*abon*) [12]. Other food waste recycling content which can substitute compost making is by utilizing food cooking residue. For example, used cooking oil for frying can be recycled into soap which is beneficial for the community [13].

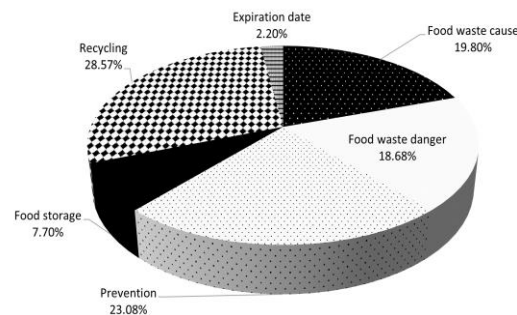


Figure 2. The education content of food waste community

Education contents such as prevention, food waste cause, and food waste danger are in the second, third, and fourth most applied content. It occurs because of its generality, so the sample which is teenagers from different backgrounds can understand the food waste cause, danger, and ways to prevent it. Besides, it is simpler for the researcher to explain the content than the specific content. Furthermore, educational content is actually a better content than recycling since preventing is better than managing the abundance of food waste resulted. The cause of food waste and its danger are essential to educating teenagers so they, as the nation's next generation, can develop more ideas to prevent food waste in the future. As a result, food waste is reduced and there is a higher chance to achieve the sustainable development goals (SDGs) such as climate action and zero hunger. One of the community educations regarding food waste which contributes to zero hunger SDGs is food guard (*Garda Pangan*). Food donation as one of the community programs is aligns with zero hunger SDGs since they are not only preventing food waste, but also giving the appropriate foods to those in need and thus helping to reduce the zero-hunger issue [14]. Besides, teenagers are required to understand how crucial food waste is so it can increase their awareness and take action on this problem. The food waste impact content which is suitable to educate is from their smallest environment or their surroundings [15]. These surroundings are family and friends, meaning that the food waste they manage is at their house and school environment. This is done so teenagers realize how close they are to this issue, and their actions can be started from this small circle then become larger over time.

The more specific content such as expiration date and food storage are the less likely content to be included in either workshop or social media campaigns. Indonesia's zero community uses several contents such as meal planning, using our own food containers, and enough food portions for their educational program [16]. The specific content in previous research is a food buying according to their own needs, neither because of panic buying nor following food trends excessively [17]. Although these are the least preferred contents for food waste educational programs, they have a high possibility to reduce food waste since the education given is clear and straightforward. Teenager focus is very hard to maintain especially if the education explanation is too convoluted, therefore applied content like how to store food is interesting to be executed. This is due to the easiness to apply this educational content at home directly by the participants. Moreover, education about an expiration date is required since the participants will have the knowledge to differentiate between the best before and expired dates. Expired date means the maximum date when a product is safe for consumption, so it is related to food safety. Otherwise, the best before date is related to food quality so it is still safe to consume but the quality is lower. This differentiation is essential because they can use this knowledge to reduce food waste. Expired dates and food storage are involved in the guidelines and recommendations for food waste workshop content [18]. In this guideline, smart storage is explained for example is fruit and vegetable storage guide and other storage tips. These tips are divided into inside and outside fridge storage. This smart storage will keep fruits and vegetables fresh so it reduces food waste since the participants can extend fruit and vegetable shelf life [18].

The article criteria used are categorized into community education, food waste management, SDGs, and regulation with its contribution are shown in Figure 3. Almost half of the article criteria in this systematic review are positioned with community education articles with a contribution of 49.3% since the objective of

this systematic review is to evaluate the food waste community education. This article's criteria are followed by food waste management (which contributes 41.43%), SDGs contribute 7.14%, and regulation criteria contribute 1.43% for this systematic review. Education about food waste in a community is more effective since each person in this community can remind each other to apply food waste education in their daily life. Community education is focused on bringing attention to the problem of food waste, encouraging behavioral changes, and providing solutions in the form of useful workshops and seminars to teenagers in the communities. Such strategies as in-depth understanding, transparent communication, and using up-to-date content to attract the participants more. Community education affects the food waste program to be more efficient. For instance, food sharing as one strategy for preventing food waste is easier to be executed if there are several communities to share it with one another [19]. Furthermore, teenagers' awareness of food waste can be increased through organizations as community examples [20].

Food waste management occupies the second position in the article criteria. This is in accordance with the results of previous educational content, where recycling is the highest content applied and recycling is a part of food waste management. Although the number of it is quite large, food waste management as an article criterion is needed to be improved for teenagers since they still have difficulties in managing their food waste at home according to the previous research [21]. A high percentage of food waste management articles can occur because most of the researcher focuses on how to solve food waste but do not comprehensively educate teenagers about the initial steps to prevent it. A case of workshop content in food waste management article criteria is by ThrowbinC invention [22]. The steps ThrowbinC has to go through are black soldier fly (BSF) larvae ingest the garbage heap and break down the food waste. After ingestion, BSF larvae can eliminate pathogenic bacteria and reduce substances that could pollute the environment. Unpleasant odors that come from garbage decomposition are also one of them. Additionally, the decomposing waste can be used to make high-protein animal feed [22].

SDGs article types are available because community education about food waste must be related to the SDGs such as climate action and zero hunger [23]. Climate action has become related to food waste due to its impact on the environment. Global warming, aquatic eutrophication, acidification, photochemical ozone formation and particulate matter are several cases which can be affected because of food waste production. The carbon footprint varied depending on the composition of the food waste from 2,000 to 3,600 kg. The amount of meat and dairy in food waste has the highest CO₂ footprints of all the food products in the previous research therefore it influences global warming more [24]. Food waste affects aquatic eutrophication by nitrogen leaching after the application of food waste's anaerobic digestion. Distribution, food preparation, and waste management form photochemical ozone. These activities take the form of food product transportation, cooking, and combustion of biogas in landfills and anaerobic digestion facilities. Through these activities, NO_x and volatile organic compounds are released [24]. Furthermore, responsible consumption and production is a goal regarding food waste issues since the indicators of this goal are food loss and food waste index. Food losses from production up to the retail level are the main focus of the food loss index (FLI) [23].

Article with regulation type is the least in this systematic review. There are several possible reasons for this phenomenon. First, the regulation type of article is generally considered stagnant and boring due to the numerous amounts of sentences in the food waste regulation. Furthermore, food waste regulation as a community education content is seldom to be found. However, regulation types of articles are essential to be developed so the communities are aware that the government is taking steps in reducing food waste [23]. The regulation of food waste may be more engaging to be actively discussed with the participant if the community education innovates its activities. One of these plans involves quizzes with various prizes to encourage participation in learning about food waste regulation as well as other games related to food waste. For example, guessing words or completing a sentence about food waste regulation. Prizes included do not have to be fresh money, it can take the form of giving them things that can develop and support the participants' skills in implementing food waste management. Education about food waste regulation can be embedded in animation and post it in the social media so it engages more audiences [25].

Food waste community education is formed through several methods such as scientific, seminars/campaigns, and workshops. Several seminars and campaigns are done through social media or online platforms. Based on Figure 4, seminars or campaigns occupy the top position in the application method of community education about food waste as much as 51.72%. In targeting teenagers, the campaign uses social media such as Instagram and Youtube to reach the audience. Instagram and Youtube are the most effective platforms to spread food waste information since they are the most frequently used social media application for teenagers [26], [3]. The media has the possibility of affecting food waste regulation development. Media, especially social media, exerts pressure on the government to develop food waste handling policies in an effort to hasten the public's understanding of food waste recycling management [27]. Therefore, *Garda Pangan* as one of the food waste communities in Indonesia utilizes Instagram as its main communication media [28]. On this platform, this community provides content about food waste either in the Instagram story, main post, or

highlights. The content that *Garda Pangan* posts are documentation about the food rescue program, donation, food waste, food loss, and environmental issue. *Garda Pangan* also inserts meaningful messages and an appreciation for the food heroes (volunteers) through the main Instagram post caption. Besides, the volunteers will feel more welcome since this community posts their new volunteer members on the main Instagram post. Thus, the volunteers feel appreciated and the probability of them joining the next *Garda Pangan* program is higher. When developing content, *Garda Pangan* always considers the language and word choices that are generic in character, meaning that they may or are easily understood by a wide audience. The content also avoids using foreign words or phrases to be communicated to the audiences [28].

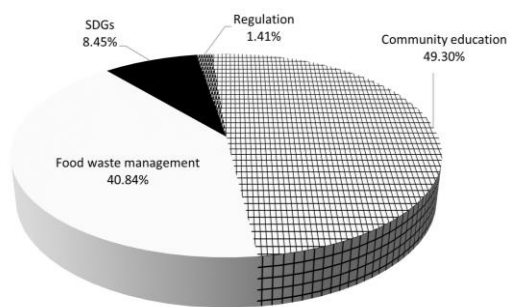


Figure 3. The article type of food waste community

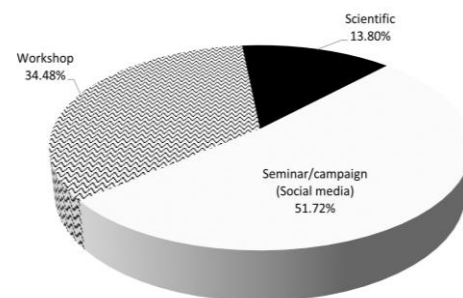


Figure 4. The food waste community education form

Another food waste community in Indonesia namely Gifood conducts social campaigns through its LINE Official Account, website apps, and Instagram [29]. The campaign, which was presented with interactive quizzes and educative poster designs, disseminated information about the global, local, and research food waste phenomena carried out at the campus cafeteria. The initiative also involves the young generation, for instance by asking them to share their thoughts on social media on how to reduce food waste. Similar to *Garda Pangan*. Gifood also shows their appreciation to those who volunteer and become food warriors [29]. Educational content with familiar or trendy designs for the participant is essential particularly for teenagers to attract their attention. #SpendYourFood (#HabiskanMakananmu) campaign on Instagram use poster image with warning, advisory information, and solution in colloquial language [7]. Images and titles engage the audience more. The online seminar Greenate #TooGoodToWaste gives insights about collection, sorting and packing, re-servable food distribution, and organic scrap distribution by *Garda Pangan*. This campaign also explains energy loss as a food waste impact. In this campaign, digital green storytelling becomes one of the strategies since sustainability concerns are tied to digital communication [30]. Mostly, the online campaign and challenges are followed by an offline workshop to enhance the participants' knowledge by implementing the insights from the online seminar/campaign [5]. Workshops contribute 34.48% of the food waste community education form targeting teenagers. This method is done since participants are directly contributing to food waste management thus taking real action to manage food waste. Gifood organizes offline events including food distribution for people in need [29].

The scientific method is the least likely method to apply which is supported by the data collected in Figure 4, where scientific only contributes 13.8% in this systematic review. This is due to the innate of scientific form is generally just in a table or narration. Besides, the communication language is a scientific language, not a colloquial language so it needs more comprehensive reading to understand the content [9]. Numerous amounts of number data proposed in the scientific method make the audience's probability of being bored higher [31]. Therefore, the content requires more development in designs or transform it into a poster image in order to attract a larger audience [32]. Scientific methods have to be combined with attractive methods such as games or mobile applications which can act as a campaign platform with comprehensive food waste information [33]. In order to maintain the characteristics of the scientific method, another way that can be applied is educating by the scientific poster. Thus, even though it is still scientific, the content will be more attractive with a variation of color and illustration. Besides, the scientific methods are able to provide points and more concise data so the participants, even the general audience will understand the content easier and quicker. Therefore, the scientific method will be increased by the increment of audience article attractiveness.

These community educations collect several data for their research with different tools used in searching it. Based on Table 1, a tool that is mostly used is a survey or questionnaire. Several researchers use surveys on their own perception, others use surveys or questionnaires as a modification of the basic source. A survey is used in collecting respondents' preferences for the media in conducting online campaigns [34].

Participants' understanding of sorting waste including food waste is by conducting pre-test and post-test [35]. Question and answer or discussion are utilized in collecting the participants' understanding level of the presented material [36] and teenagers' food waste management awareness [37]. In the measuring of sustainable consumption messages towards attitude, subject norm, and perceived control as well as the significance of attitude toward intention uses a questionnaire with scales [38]. This questionnaire scales range from 1 means strongly disagree to 5 means strongly agree and it adopts the previous research questionnaire. Then, this data is analyzed with simple and multiple regression analysis [38]. A questionnaire was also used for collecting how participants understand food waste management over a webinar [39], knowing their knowledge regarding food waste campaigns [40], and community interest in food waste reduced applications [41]. Public service advertising data regarding food waste uses the semiotic theory of the 5 codes and is analyzed with purposive sampling [42]. In order to know the reason behind the act of participants' food waste and to determine the social media used, surveys and observations are conducted. However, to know the specific reason and detailed explanation, previous research arranged an interview with participants one on one [43].

Based on the food waste literature source, educational contents that can be applied to community education are food waste issue examining such as the reasons why waste happens, its emergency to be reduced including the recent data about food waste production, provide prevention such as how to do smart shopping, store and prepare food according to their needs [18]. Moreover, relating food waste prevention with saving money, refers to Figure 5. One of the examples is storing foods to have a longer shelf life thus minimizing money spent on food. In addition to that, more strategies to reduce food waste have to be explained in community education. Focus on the things that teenagers can implement so they will conduct it unencumbered. Illustrations on meal planning, preparing, and choosing what to eat and the right time to eat them (related to the expiration date and best before) are essential to be in the educational content. Discussion among participants is important, thus they can be grouped to do the task for instance the food waste recommendation strategies [18]. Smart preparation and smart saving are educated to teenagers since they must have a concern about money saving. These strategies are explained as eating what is necessary first, including old products and leftovers. This will be related to refrigeration storage tactics, which is soon spoiled food should be moved with a visual cue to the front of the shelf. It indicates that the first or front food product in the refrigerator is designated as the food product which has to be eaten first [18].

Table 1. Data collection of several food waste community education articles

No.	Collected data	Data collection tool	Reference
1.	Respondents' preferences in media campaigns	A survey	[34]
2.	Participants' understanding and skills in sorting waste	Pre and post-test scores of sorting waste	[35]
3.	The participants' level of understanding of the material presented	Question and Answer (discussion)	[36]
4.	The significance of sustainable consumption messages towards attitude, subject norm, and perceived control as well as the significance of attitude toward intention	A questionnaire with scales	[38]
5.	Participants' understanding of food waste management after the web seminar (webinar)	A questionnaire	[39]
6.	Teenagers' awareness of organic food waste management around them	Question and Answer (discussion)	[37]
7.	The selection of public service advertisings (PSA)	Semiotic theory the 5 codes and purposive sampling	[42]
8.	Participants' knowledge about food waste campaigns to reduce food waste	A questionnaire	[40]
9.	Reasons the respondents waste their food and media determination	Survey, observation, and interview	[43]
10.	Community interest if there is an application that can deal with the problem of food waste	A questionnaire	[41]

According to the conceptual map, it is known that composting is the most used content hence community education needs more innovation in applying food waste content. Prevention methods content has to be more focused. This is due to the impact of food waste itself. It is better to prevent food waste than recycle it because before being recycled, those wastes negatively impact the environment both increasing global warming and carbon footprint [24]. More specific content must be developed since participants will be more attracted to something easy and they can directly apply it in their daily lives. Besides, specific content also directly shows the participant what they have to do in order to reduce food waste. The contents are preferable to be some educational materials that are adaptable and flexible so they can be done by the participants at any time. Accessible content for participants' further studies and application is required. Thus, social media is a suitable platform for keeping food waste education material [7]. Not only does it maintain the educational

materials, but it also has the ability to distribute them through engagement, particularly on Instagram. Engagement becomes a huge part of social media such as Instagram and Youtube since people will know more about food waste content through this engagement. Engagement is related to what the account has posted on their social media. Therefore, several action recommendations to increase food waste account engagement are making attractive post designs as well as the form of how the account posts food waste education to teenage communities [7].

The food waste post designs are preferable to be simple, colorful, trendy, and have an eye-catching thumbnail or first impression of the post. These methods are done to attract the audience as soon as they see the social media post without realizing what the content is about. After that, the audience starts to read about the Instagram content, which is food waste, the danger of it, and how they can contribute to reducing food waste by preventing it [7]. These efforts in engaging the audience include fonts and colors to be considered in a post so it could be semi-formal fonts, provide illustrations, but remains the simplicity of it. Furthermore, interactive food waste-related quizzes in Instagram stories have a role to make the audience believe that it is just a game so they will be interested to participate [7]. If it is in Youtube media, then the thumbnail and title are crucial since they can attract the viewer to click on the food waste video. An animation-based video is more interesting, especially in targeting teenagers [25]. Informative and persuasive approaches are shown in this animation video content regarding food waste reduction [25]. The seminar is a good way to have socialization about food waste for a general audience. However, rather than just listening to a seminar with the least interaction, it is better to conduct a workshop. In order to improve its attractiveness to teenagers, seminars can be accompanied by social media utilization, for example is an animation video. The video content can incorporate the importance of protecting the environment and nature, the benefits of organic waste processing, and food processing until the waste process. In particular, showing a film about making clean tempeh and disposal of waste in accordance with the processing standards [44]. Furthermore, in order to get complete attention and prevent participant boredom during the activity, a brief conversation about the participants' current knowledge and their ideas on the topic subject should be held before the socialization. Their interest in the presentation of information on general waste knowledge was very strong, especially when there was a question-and-answer session [45].

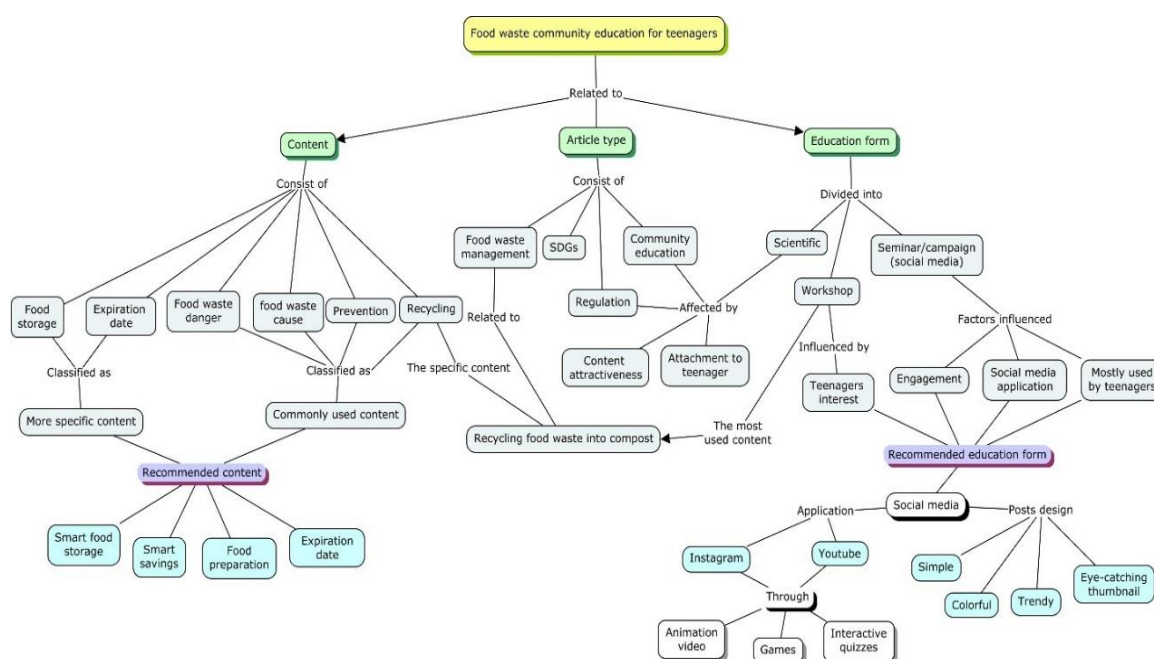


Figure 5. Conceptual map of food community education for teenagers and its recommendations

According to data in this systematic review, food waste content about compost has been too common and it can affect the seminar and workshop to be monotone which lack of fun experience [46] although it is still one of the contents in educating teenagers with various materials left over from organic waste around their environment [47]. Other alternative workshop activities related to composting are by making eco-enzymes from fruit peel. Therefore, if both activities are combined, it will create a more enjoyable encounter. Innovation

content is essential to maintain the workshop continuity such as food waste management education recycled into biogas which uses a grease trap for the liquid waste [48]. Challenges, games, and quizzes are commonly used to attract more audiences and especially to maintain the teenagers' focus on food waste material. Besides, another food waste campaign design includes content referring to attention, interest, search, action, share (AISAS) communication strategy to trigger the target audience for joining the campaign, increase their awareness to appreciate food, educate targets not to waste food but to share it with others, also remind and invite people to participate in the campaign [49]. Other than that, community education has to have fresh and new content to attract the audience, especially in social media. An example of applying design content in food waste community education is an e-book designed with illustrations as well as posters. Pocketbook and brochure food waste design for the workshop [50].

4. CONCLUSION

Based on the results, recycling content occurs as the most frequent food waste community education content in Indonesia which contributes to 28.57% of the education content total amount. Seminar/campaign in social media is the top form of community education due to its effectiveness especially for teenagers by using Instagram and Youtube. Apart from that, Indonesian food waste communities such as *Garda Pangan* and *Gifood* have applied the use of social media to enhance their food waste-reducing programs. The SDGs which are possible to achieve from the workshop and seminar are climate action and zero hunger. This systematic review's limitations are sample characteristic bias and bias in the evaluation of community education content. Further review of the mobile application in order to reduce food waste through donation, food sharing, and other programs is expected to be discussed by future researchers. In order to attract more audiences, the community is hoped to have an innovation in education content. Customers, especially teenagers, are expected to take action in reducing food waste with little steps in meaningful ways such as meal planning and buying food as needed.

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BIOGRAPHIES OF AUTHORS



Monica Audrey    was born in Jakarta, West Java, Indonesia. She received a 100% TPKS Scholarship and Mentor Scholarship from Bina Nusantara University. She is currently an undergraduate student pursuing a bachelor's degree in Food Technology Department as well as a mentor and a laboratory assistant at Bina Nusantara University. She loves to do food innovation and support others' education through sharing her knowledge and experiences. Her research interests are food innovation, gastronomy, science education, and active learning. She can be contacted at email: monica.audrey@binus.ac.id.



Elisabeth Rukmini    was born in Temanggung, Central Java, Indonesia. She received a Fulbright Scholarship to pursue Ph.D. in chemistry education at Miami University, Oxford, Ohio. She is currently worked at Bina Nusantara University, one of the best private universities in Indonesia to be the Manager of Strategic Development at the university level. She loves to mentor the youth through teaching and research mentorship. At Binus University, she dedicated her mentorship to the Food Technology Department to teach Chemistry and Research Method and Scientific Publication. Her research interests are active learning, green chemistry, science education, medical education, strategic planning, and higher education policy. Present address: Elisabeth Rukmini, Binus University, Kampus Anggrek, Kemanggisan, Jakarta 11480, Indonesia. She can be contacted at email: Elisabeth.rukmini@binus.ac.id.