Application of Attribution Theory to Understand Renewable Energy Users' Perceptions

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ABSTRACT

Weiner's attribution theory is used in this study to explain the perceptions and attitudes of early adults in using renewable energy. Energy policy in Indonesia supports the development of the use of renewable energy. However, this policy contradicts the still high use of fossil energy as the biggest support for the national electricity demand. This policy raises various perceptions in society, especially in early adulthood. The method used is quantitative with a survey of 135 respondents. Sampling using simple random to respondents with an age range of 18-40 years. The results of this study indicate that the perceptions and attitudes formed are quite positive. They show a high interest in using renewable energy whose information they get from social media. Researchers found that early adults' perceptions and attitudes toward information on social media were predictable and explainable. The early adult age group showed a higher internal attribution value than external attribution on the use of renewable energy provided by social media. This shows that the perception and attitude toward using renewable energy are positive and the behavior that may arise from the information it consumes. Thus, the results of this study can be used as recommendations for policymakers to use social media as the main media to gain trust from early adults, especially for the use of renewable energy in Indonesia.

Keywords: Attitude; Interest; Perception; Renewable Energy; Social Media.

ABSTRAK

Teori atribusi Weiner digunakan dalam penelitian ini untuk menjelaskan persepsi dan sikap dewasa awal penggunan energi terbarukan. Kebijakan energi di Indonesia mendukung pengembangan pemanfaatan energi terbarukan. Namun, kebijakan tersebut bertolak belakang dengan penggunaan energi fosil yang masih tinggi sebagai penopang terbesar kebutuhan energi listrik nasional. Kebijakan ini menimbulkan berbagai persepsi di masyarakat, khususnya pada usia dewasa awal. Metode yang digunakan adalah kuantitatif dengan survey kepada 135 responden. *Sampling* menggunakan *simple random* kepada responden dengan rentang usia 18-40 tahun. Hasil penelitian ini menunjukan bahwa persepsi dan sikap yang terbentuk cukup positif dan mereka menunjukan minat yang tinggi pada penggunaan energi terbarukan yang informasinya mereka peroleh dari media sosial. Peneliti menemukan bahwa persepsi dan sikap dewasa awal pada informasi yang ada di media sosial dapat diprediksi dan juga dijelaskan. Kelompok usia dewasa awal menunjukan nilai atribusi internal lebih tinggi dari atribusi eksternal pada penggunaan energi terbarukan yang disediakan media sosial. Ini menunjukan persepsi dan sikap penggunaan energi terbarukan bernilai positif begitupula dengan perilaku yang mungkin ditimbulkan dari informasi yang dikonsumsinya. Dengan demikian, hasil penelitian ini dapat dijadikan rekomendasi bagi pengambil kebijakan untuk menggunakan media sosial sebagai media utama untuk mendapatkan kepercayaan dari dewasa awal, khususnya untuk penggunaan energi terbarukan di Indonesia.

Kata Kunci: Sikap; Minat; Persepsi; Energi Terbarukan; Media Sosial.

INTRODUCTION

Theoretically and practically, Technology Acceptance Model (TAM) is a model that is considered the most appropriate for explaining how users receive a system. TAM states that behavioral intention to use is determined by two terms. The first is perceived usefulness, which is the extent to which a person believes that using the system will improve his performance. The second is perceived ease of use which is defined as the extent to which a person believes that using the system is something easy (Supriyati & Cholil, 2017). TAM also states that the impact of external variables such as (system characteristics, development process, and training) on intention to use is mediated by perceived usefulness and perceived ease of use. The TAM concept also states that perceived usefulness is influenced by perceived ease of use (Palupi, 2015). In TAM, attitude toward the use is conceptualized as an attitude towards the use of the system in the form of acceptance or rejection as an impact when someone uses technology in their work. Other researchers (Tjandra & Tjandra, 2013) states that the attitude factor is one aspect that influences individual behavior. A person's attitude consists of elements of cognitive or perspective (cognitive), affective (affective), and components related to behavior (behavioral components). However, basically, the basic form of TAM, according to Davis (1989), are the four main constructs and the relationship between the four constructs, namely Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Attitude Toward Using (ATT), and Actual System Usage (Palupi, 2015). TAM in this study also uses the four main constructs and includes external variables such as user characteristics and system characteristics that indirectly influence technology acceptance (Palupi, 2015). Through TAM, researchers can measure perceptions and attitudes in early adults to see how high their interest in renewable energy is.

The age range of early adult individuals used in this study was between the ages of 18 years to 40 years, according to the adult developmental stage mentioned by Hurlock (Kamilah & Hanifah, 2021). This age range corresponds to the age range of social media users in Indonesia in 2020. The first place is the age range of 25-34 years, with details of 20.6% male users and 14.8% female users. In second place is the age range of 18-24 years, with 16.1% male users and 14.2% female users. The third order is in the age range of 55-64 years, and the last order is at the age of 65 years and over (Annur, 2021).

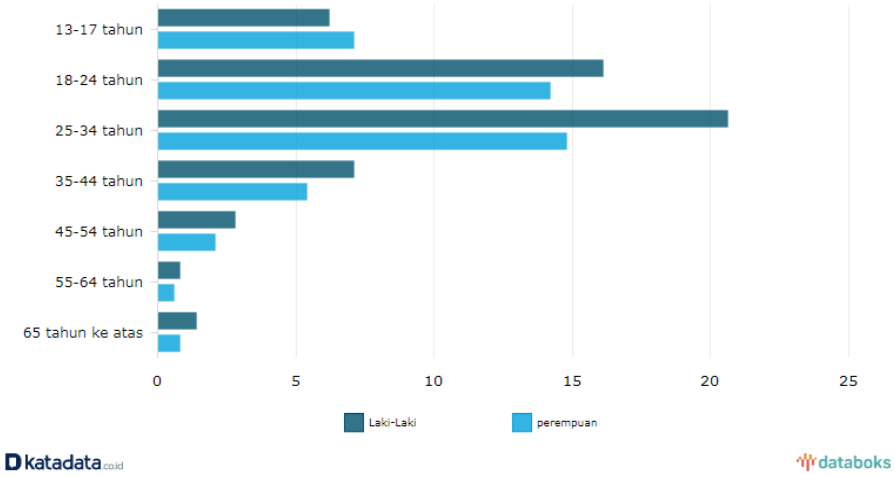


Figure 1. Indonesian Social Media User Data (Source: Katadata.co.id, 2021)

Based on Figure 1, the researcher will use the age range set by Hurlock to limit the subjects in this study, namely the age of 18 to 40 years in males and females. During this period, there was a transition from dependence to independence, both from an economic perspective, freedom to determine one's identity, and a more realistic view of the future. So, those in this age range need to continue studying their environment from the aspect of education, references, and experience to get the desired independence. Based on these aspects, researchers can measure there are perceptions and attitudes carried out from two aspects, including *Frame of reference*, namely knowledge possessed by humans which is influenced by education, reading, research and from the aspect of *Frame of experience*, namely experiences that have been experienced in one's environment.

Feldman stated that the formation of perception is also strongly influenced by the information that was first obtained. Therefore, an unpleasant first experience will greatly affect the formation of one's

perception. However, because the stimulus faced by humans is constantly changing, perception can change according to the stimulus received (Feldman, 2012). Research on perceptions and attitudes has been carried out by researchers from social psychology studies. This study aims to determine how respondents perceive an object in the study. In general, perceptions are divided into two sides, namely positive perceptions with various sentences and positive attitudes that appear as well as negative perceptions with various sentences and negative attitudes that arise as a result of the stimulus given regarding the object of research being studied. Perception can be interpreted as a person's point of view on an object so that it can influence the decision-making process. If someone's perception is good or positive about something, then decision-making will also be good and vice versa. Kotler states that "Perception is the process by which people select, organize, and interpret into form a meaningful picture of the world" (Nilawati, 2013). Based on this statement, it can be understood that perception is owned by everyone, which is then translated into a sentence or an image that has its own meaning. Therefore, the process of meaning for each person to a stimulus can be different from one another.

Perception is related to how to get special knowledge about objects or events at a certain time. Therefore perception can occur at any time when the stimulus moves the senses. Perception is also a psychological process as a result of sensing and the last process of consciousness, thus forming a thinking process. An attitude emerges through the perception that is formed, which is a tangible manifestation of one's perception. Attitudes that arise from perception are interpreted as approval or rejection of something. Through attitude, a person can grow a certain interest in an object in the surrounding environment, especially if it is related to his survival. One of the needs that must be met is the need for energy. Without energy, it will be difficult to live productively in everyday life. The form of energy closest to everyday life is conventional energy derived from fossils or nuclear. However, as has been widely campaigned by the local and global environmental organizations, several developed countries have realized the impact of using fossil-based energy continuously and started switching to renewable energy based on fossils such as sun, water, wind, and wave.

Public demand for renewable energy is also starting to emerge. The people's desire to switch to new and renewable energy (EBT) is very large. They are even willing to pay more for electricity if it comes from clean energy. The conclusion was obtained from a survey conducted by Koaksi Indonesia. Meanwhile, the survey conducted by IESR in households in Jabodetabek and Surabaya also shows that people accept and are willing to purchase EBT electricity, especially solar cells if they are available and easy to obtain (Nurcahyadi, 2019). Communities in several areas in Indonesia that have the potential to build renewable energy sources also provide a fairly good perception of the use of this renewable energy. People in Pauh Duo Subdistrict, South Solok Regency perceive that the construction of a Geothermal Power Plant (PLTP) from the social aspect has a fairly good perception index with a percentage of 56.89 percent.

From the economic aspect, the perception index is quite good with 60.35 percent. Judging from the environmental aspect, it has a good perception index of 76.29 percent (Iqbal, 2020). This emerging perception, of course, does not just come. There are efforts and stimuli provided so that people have a good perception of the use of renewable energy. The stimulus that can help the community to have a good perception is through campaign activities carried out by the relevant agency or someone who has good credibility in their field and gains public trust. Counseling has an impact on people's perceptions for the better of the potential development of geothermal potential, this can be seen from the increase in the pre-test and post-test obtained from 49.53 to 86.59 percent, and the community expects to be involved in the geothermal development process (Suroso et al., 2020). Several studies have shown the various attitudes of society towards innovation, in this case, renewable energy. Binti Ahamad et al. (2019) show that the community has high hopes for renewable energy (solar energy). However, they do not understand and have not been actively involved by the government/PLN, and they need knowledge about the use of renewable energy. Therefore, education is needed to provide understanding so that the community is willing to participate actively with a strategy to achieve goals. Besides that, Hidayah et al. (2016) said that generally, people would accept renewable energy, but education was needed because they were not familiar with it. This study provides suggestions for forms of education such as socialization, training, and mentoring. Public acceptance of renewable energy innovations must also be in line with government support, such as policies.

In general, Indonesia's existing energy policies are very supportive of the prospect of developing the use of national renewable energy and energy efficiency. However, fossil energy is still the biggest

support for national electrical energy needs amid priority policies for the use of environmentally friendly renewable energy to reduce greenhouse gas emissions (Adhikri et al., 2017). The Indonesian government has also established an Energy Independent Village (DME) program to meet its energy needs. This program was first launched by the President of the Republic of Indonesia in 2007. The criteria for an Energy Independent Village are villages that can meet a minimum of 60% of their total energy needs (electricity and fuel) by empowering the potential of local resources and the growth of productive activities to improve the village economy as a source of energy and impact of local energy availability. It is hoped that with this Energy Independent Village, the community's dependence on non-renewable energy sources and the use of subsidized energy from the government can be minimized.

An example of the use of renewable energy in Indonesia is Margajaya Village, Padang Jaya District, North Bengkulu Regency, Bengkulu Province. The model and simulation have been fulfilled as an independent village because the village can produce electricity by 95% of the total 100% electricity consumption (Juwito et al., 2012). The current state of energy has taught us that serious and systematic efforts to develop and implement renewable energy sources to reduce dependence on fossil fuels need to be made immediately. The use of renewable and environmentally friendly energy sources also means saving the environment from the various harmful impacts caused by the use of fuel (Kholiq, 2015). With renewable energy development, consumers will become more involved and have a central role in community systems in the energy-independent area. The results of this study have implications for policymakers who wish to increase the demand for renewable electricity under current market regulations. This research on the influence of consumer behavior encourages consumers' choices to use renewable energy electricity. This effect can lead to a faster increase in the demand for renewable electricity at lower costs. Some steps can be taken at a macro level that can improve the lives of individuals without actually engaging in any action, such as installing renewable energy in all publicly owned buildings (Febriani & Avicenna, 2021). Comparing the amount of financing with electricity using renewable energy to conventional electricity (PLN), it only takes seven years to recover investment costs (Aprillia et al., 2019).

The Trend world of new renewable energy is now a must, no longer an option, no longer an alternative. The problem with renewable energy in Indonesia is that it still cannot compete with fossil-based energy because the technology is still new, expensive, not easy, inefficient, and not yet effective (Ferial, 2015). Indonesia is also following the same trend in the use of renewable energy. Indonesia's use of renewable energy increased by 13.5% (CAGR) from 2 million tons SBM to 7.1 million tons SBM in the 2007–2017 period. In Indonesia, in 2017, only 4.1% of the total energy consumed came from renewable energy. Indonesia is still too dependent on fossil energy such as fuel oil (BBM), coal, and gas to meet energy needs. According to data from the Ministry of Energy and Mineral Resources, the potential for renewable energy that can be used as energy for power generation reaches 441.7 GW consisting of 94.3 GW of hydropower, 207.8 GW of solar power, and 60.6 GW of wind power, 32.6 GW of bioenergy, 17.9 GW of marine hydropower and 28.5 GW of geothermal. The capital aspect is still the main obstacle to the use of renewable energy in Indonesia. Currently, investment in the construction of renewable energy plants tends to be more expensive than conventional energy such as fuel, coal, and gas. Even though the government is interested in keeping electricity rates low, the government is still subsidizing some PLN customers. The trend at the global level that prioritizes the development of renewable energy plants today will undoubtedly have an impact on cheaper energy costs at the global level in the long run (Harisandi, 2019). During a pandemic like today, the need for energy is much higher than before. PLN as the sole electricity supplier in Indonesia must ensure that it has sufficient electricity supply for all its consumers. The increasing demand for electricity makes consumers hope that PLN can start switching to environmentally friendly electricity (E2consulting, 2021).

Various government efforts have been made to realize renewable energy and continue to strive to meet energy targets and needs in Indonesia. In 2000, Indonesia met 19.5 percent of the target of 23 percent of renewable energy use of the total national primary energy mix in 2025. This target is as stated in the Paris Agreement. In this case, the government uses a strategy of creating new markets that utilize renewable energy in the form of solar energy, which is not limited to the construction of rooftop solar power plants (PLTS). Indonesia is also developing rooftop solar panels by utilizing ex-mining land and other potentials (Liputan6.com, 2020). To contribute to meeting these targets, this study tries to identify groups of people who are considered to have an easier transition to using NRE, namely young adults. Thus, it is necessary to know the studies that identify perceptions and attitudes

so that factors can be found that support positive perceptions and attitudes to create campaigns with appropriate messages. Through various efforts made by the government to achieve energy independence, the public needs to be educated about this renewable energy. As a form of education, the government can conduct a campaign that expect people who have participated in the campaign program can perceive these activities positively so that their attitudes and interests, especially at the young age of adults, to use renewable energy can be formed and in the end will be ready to consume renewable energy. This is because the availability of EBT as a form of supply must be balanced by the community's readiness to use it as a form of demand so that the wheels of the economy in Indonesia keep turning. This study will identify perceptions and attitudes quantitatively. Several studies have described people's attitudes towards renewable energy, specifically on certain energies and using qualitative methods. This study will also enrich the study by providing an overview of the perceptions and attitudes of early adults towards renewable energy. The early adult community group was chosen because this group will be the target user of renewable energy innovation in the next ten years. Therefore, the results of this study are expected to be one of the contributions to the implementation of renewable energy in Indonesia.

METHODS

Measuring perceptions is almost the same as measuring attitudes. Although the material being measured is abstract, attitudes and perceptions can be scientifically measured, where attitudes towards objects are translated into a number system. This research begins the stages based on the concept of TAM (Technology Acceptance Model). This concept then becomes the basis for determining the variables used in this study. The variable conceptual definition stage is carried out so that the meaning can be adequately understood through the measurement of the perception variable (X1), attitude variable (X2), and interest variable (Y). The use of renewable energy is taken from the results of previous research (Alfala, 2020). These three variables need to be given an accurate, consistent conceptual definition to make no mistakes in determining the research instrument. After getting a conceptual definition, before data collection begins, the researcher makes an operational definition that includes the identification of the three variables so that they can be used for research. Furthermore, the variables are identified by lowering them into indicators, items, and statement items and determining the scale. In the perception variable (X1), there are two indicators, with each indicator consisting of three items and six statement items. As for the Attitude variable (X2), there is one indicator with three items and three statement items. Finally, in the Interest variable (Y), there is one indicator with four items and four statement items. The scale used to measure these variables is Likert with five answer choices.

Next is the operational definition test in the form of an instrument test. The instrument made was tested in the form of a pre-test to 30 participants directly. Before the questionnaire was given to the actual respondents, the validity and reliability of the questionnaire were tested first. The validity test was done using the statistical formula of Pearson's Product Moment correlation coefficient, and the reliability test uses the Cronbach Alpha coefficient formula. Then, both are processed using *Statistical Package for the Social Sciences* (SPSS) version 27. The basis for making decisions on the validity test used are:1) The variable is said to be valid if the p-value <0.05 means Ho is rejected and Ha is accepted. The variable is said to be invalid if the p-value > 0.05 means Ho is accepted and Ha is rejected. Meanwhile, in the reliability test, the variable is said to be reliable if the Cronbach Alpha value is > 0.60. From the instrument test results, valid and reliable results were obtained, and then the instrument was distributed to 100 participants online. The sampling technique used in this study is simple random to reduce bias or bias in favor of members of a particular population. It can detect standard errors in research that may arise due to the weakness of this sampling technique, which cannot represent 100% of the intended population. So a standard is determined. The error in sampling is 5%, so the data is considered valid at 95%. The sample taken in this study is young adults who publish the use of or information about renewable energy on their social media, with as many as 135 respondents. When the complete data is ready, the next stage is the analysis using SPSS, the presentation of the processed data, and the data's interpretation. This data collection process was carried out from March to August 2021. The population in this study was all social media users in the early adult age range, namely 18 years to 40 years, according to Hurlock's stage of adult development in 1996 (Putri, 2018). This age range corresponds to the age range of social media users in Indonesia in 2020.

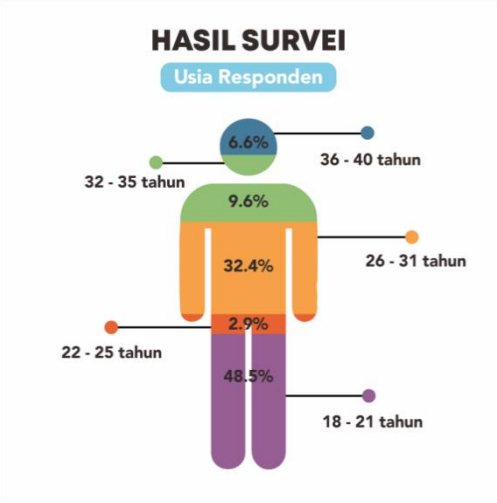
RESULT AND DISCUSSION

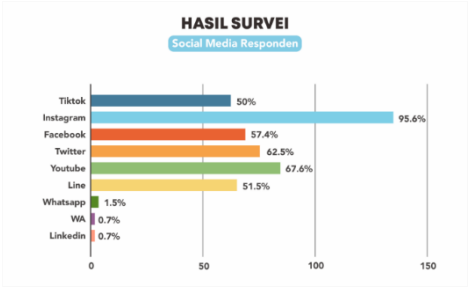
Previous studies have shown that social media can be used for two communication purposes, namely, vertically and horizontally (Chen & Wei, 2020; Wang et al., 2022). Vertical communication occurs between people at different hierarchical levels (Doonu Gbarale & Lebura, 2020; Wang et al., 2022), whereas horizontal communication usually occurs between people with the same hierarchical status level (Bartels et al., 2019; Wang et al., 2022). Vertical communication includes information that helps define the team and the responsibilities and roles of subordinates in the team (Bartels et al., 2019). Horizontal communication includes task-related information describing team activities and progress (Bartels et al., 2019) and informal information that increases team members' sense of belonging and cohesion (Chen & Wei, 2020). Therefore, the underlying mechanisms by which social media is used for vertical and horizontal communication contribute to the perceptions and attitudes of groups of early adults using renewable energy that deserves investigation. A person's perceptions are formed in harmony with each other so that they can influence attitudes and behavior towards certain events or other things. In communication psychology research, the theoretical approach of Attribution Theory is widely used to see a person's perceptions, attitudes, and behavior (Nilsen, 2020).

According to attribution theory, for example, someone in the early adulthood age group can say "I am a renewable energy user" by making an internal attribution. In contrast, another person in the same age group and not a renewable energy user can say "There are no renewable energy sources in their area, although I want to use them" by making an external attribution. The perception that human behavior continues to change based on its experience becomes the basis for determining subsequent behavior. However, it is unknown with certainty to whom, what, in what way, and by what means consumers make their attributions to a product and service such as renewable energy as long as they are constantly exposed to information through social media or other forms of media. So, the perception of their attitudes and behavior towards the use of renewable energy will continue to change so that the attribution cannot be known with certainty without research. In this case, education on the use of renewable energy carried out by the government through the relevant State-Owned Entities (SOEs) is still being carried out to create positive perceptions of products and services among consumers, especially consumers in the early adult age group. Internal and external attributions can be seen in how they evaluate renewable energy during the process of consuming information on social media. In this case, education on the use of renewable energy carried out by the government through the relevant SOEs is still being carried out to create positive perceptions of products and services among consumers, especially consumers in the early adult age group. Internal and external attributions can be seen in how they evaluate renewable energy during the process of consuming information on social media. In this case, education on the use of renewable energy carried out by the government through the relevant SOEs is still being carried out to create positive perceptions of products and services among consumers, especially consumers in the early adult age group. Internal and external attributions can be seen in how they evaluate renewable energy during the process of consuming information on social media.

Attribution theory in communication science is used as a theory to help provide explanations behind social-communicative actions. Attribution as a cause for action and an outcome: when we think of reasons for another person's communication or behavior, it influences how we perceive other people and our communication with them, and attribution as the meaning given to a behavior: "how attribution reflects the given meaning people on the act of communication" (Braithwaite & Schrodt, 2021).TThis theory focuses more on the behavior of the individual. The relationship between attribution theory and this research lies in the perceptions and attitudes generated after consuming information about renewable energy provided by social media. This study uses attribution theory because individual behavior is needed in perceptions and attitudes. For example, individual behavior is shown in voluntarily choosing social media as a medium of information about renewable energy products and services and in recommending or giving approval to information received through social media. One of the developments of attribution theory can be seen from the Theory of Reasoned Action (TRA), which was first introduced byAjzen & Schmidt (2020) and derived from previous research known as The Theory of Attitude. TRA is a theory related to individual attitudes and behavior in carrying out activities. This theory assumes that humans are creatures who can act of their own volition and plan what they will do. This theory aims to make a decision to perform a certain behavior. TRA then developed into Technology Acceptance Models (TAM), adoption of the TRA model, which is reasonable with one premise that a person's reaction and perception of something

will determine that person's attitude and behavior. Reactions and perceptions of social media users will influence their attitudes towards acceptance of the media. One of the factors that can influence it is the perception of users of renewable energy through social media as a reasoned action in the context of users of information technology in the form of the internet (social media), so that the reason someone sees the benefits and ease of using social media makes that person's actions/behaviors a rejection. measure the acceptance of a technology. If it is associated with renewable energy users in Indonesia who are in the early adult age group, it can be said that they accept technological developments and show positive reactions to a technology, which can increase the number of renewable energy users because they see changes in information systems that use internet technology in delivering message/information. In the following, the researchers present the results of the demographic mapping of renewable energy users intended in this study:





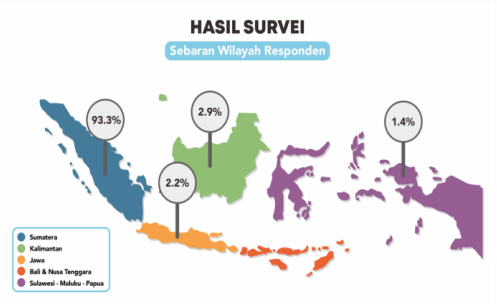


Figure 2. Results of the Demographic Mapping Survey of Respondents
Source: Researchers, 2021

Figure 2 shows the demographic results of the respondents in this study. Research respondents were dominated by men (62.5%). The dominance of the male sex is in the age group of the majority of the informants are 18-21 years (48.5%) and 26-31 years (32.4%). These respondents are active social media users on Instagram (95.6%), YouTube (67.6%), and Twitter (62.5%). Based on the survey results, the majority of respondents came from the island of Sumatra (93.3%) with the latest education at the level of High Schools (SMA/SMK) (45.6%), and Undergraduate (S1/D4) (33.8%) and the majority were students (51.5%) with an income of not more than one million rupiahs (43.4%). In addition to validation in the population and sample determined by the researcher, namely early adulthood, this demographic data also serves as initial data to identify consumers who are interested in using renewable energy. This demographic data can be used as initial data in formulating a campaign strategy or promotion strategy for renewable energy products in Indonesia.

Figure 3. Respondents' Assessment on Variables X and Y
Source: Researchers, 2021

Figure 3 represents the overall results obtained from the questionnaire to test the influence of perceptions and attitudes on interest. The results on the perception variable show that most of the informants feel that the use of renewable energy is beneficial for themselves and the environment (55%) and that the use of renewable energy has a positive effect on the country's economy. On the other hand, the lowest score on the perception of mastery of related energy technology is effortless (42.6%). The attitude variable shows that most of the information agrees with the attitude related to using renewable energy as an excellent thing to do (58.8%). Instead, become a better person by using renewable energy for daily needs (42.6%). The interesting variable shows that the informants are interested in renewable energy as electrical energy in their respective homes (45.6%). Figure 3 shows that the respondent's assessment of the X variable indicates that the respondent strongly agrees with the statement that the use of renewable energy is beneficial for themselves and the environment. Suppose it is referred to as the operationalization of the variables that have been compiled previously. That case shows that social factors such as social and environmental influences can affect the Perceived Ease of Use (PEOU). PEOU refers to "The degree to which a person believes that using a particular system will be free of effort". Therefore, this study's perceived ease of use refers to the extent to which a person believes that using renewable energy will be easy and effort-free. The trust that is raised in the operationalization of this research variable involves social factors, including family, roles and status, and age and stages of the life cycle. Family members are considered to have a substantial impact on consumer behavior. Marketers are interested in the role and influence of wives, husbands, and children. Also, age and life cycle stages influence buyer behavior because people's buying styles change over time (Mashao & Sukdeo, 2018). However, among all factors, such as physical and social factors, cultural and personal factors were the main factors influencing consumer buying behavior for durable products, such as TVs, refrigerators, motor vehicles and so on (Kotler, 2018). This statement shows that cultural factors and personal factors are considered to be determining factors in buying behavior.

In contrast to the findings in this study, which state that social factors are one of the factors that determine whether a consumer will use renewable energy or not, the use of PU (Perceived Usefulness) as the second indicator in the Perception Variable shows that PU or perceived usefulness can be interpreted as "the interest" which is the behavioral intention to use or the intention to use

renewable energy to use new technology in the future. This study found that there are interrelated effects of various social factors such as social and environmental influences that can significantly change user behavior towards the acceptance of new technologies that can make respondents interested in using renewable energy, both internally such as family and externally such as the environment.

Figure 4. Results of t-test and F-test
Source: Researcher, 2021

Figure 4 shows that the perception and attitude variables partially and simultaneously significantly influence interest in using renewable energy in early adulthood. Partially, on the perception variable, the value of the t count (13.952) is greater than the t table (1.978). Likewise, with the attitude variable, the value of the t count (13.683) is greater than the t table (1.978). Simultaneously, the F test shows that the calculated f value (125.242) is greater than the f table (3.06). Based on the partial test results, it is shown that the average value of a sample taken randomly from a population does not show a significant difference in perceptions, attitudes, and interests of early adults towards the use of renewable energy on social media. If connected to TAM model, which looks at the influence of social factors and control factors in behavior not included in the model, the results obtained in this study already meet the TAM criteria. TAM is used to predict usage and user acceptance based on perceived usefulness and ease of use. TAM understands that behavioral intention is a significant determinant in actual system use. TAM also shows that two important things determine behavioral intention: perceived usefulness and ease of use. Perceived usefulness refers to “a person’s level of belief that using a particular system will improve its performance" (Suyanto & Kurniawan, 2019). Meanwhile, the F test shows that the perception and attitude variables together influence the interest in using renewable energy. Referring to the results of the F test, it can be seen that TAM with indicators of PEOU, PU, attitudes, and interests can be used together to explain the determinants of acceptance of information-based technology in general and explain the behavior of end-users of information technology with quite extensive different variations and population of its users. Ideally, TAM can be used by respondents in this study to show that their perceptions and attitudes towards renewable energy conveyed through social media can positively influence the use of renewable energy. Thus, the delivery of information through social media is clearly needed as the most accessible information channel to receive update for research respondents.

In accordance with the purpose of this study is to develop a research model using the Technology Acceptance Model (TAM) as the main theoretical framework. The research model is focused on

perceptions and attitudes toward the use of renewable energy using a questionnaire-based survey method. Based on the results of research and data analysis using SPSS (*Statistical Package for the Social Sciences*) as well as empirical validation of the proposed research model, environmental care is an issue that gets attention such as in product selection, selection of certain services, and options for using renewable energy. The action of using technology that is more environmentally friendly also has its own value for consumer groups who think about the impact of their use on the environment. This, for one thing, continues to grow because information about the negative impact of consumption of goods and services on the environment continues to be echoed. Community care for the environment can be shown by consuming or using environmentally friendly resources. By caring for the environment, humans become individuals who fulfill their responsibilities to nature. For renewable energy sources located in the village and managed independently by the residents, an additional approach is needed to motivate all residents to use renewable energy in their environment. According to Suryandari and Wijayani (2021), cultural approaches and local wisdom can be an effort to preserve the environment. With the development of this concern, the use of renewable energy has begun to be used both at the organizational and personal levels, for example, solar energy. In the perception variable, renewable energy is considered to positively impact the country's economy and oneself; for instance, Prastowo (2015) found that coconut and sago palms can be a source of renewable energy. This shows that if the choice of renewable energy continues to increase, and coconut and sago, for example, become one of their energy sources, coconut and sago farmers will increase their economic welfare. This increase will affect the country's economic cycle and potentially be exported to be an energy source. In an environmentally responsible manner, both users and farmers have contributed to the use of plants for more diverse and good impacts on the environment. Research by Joseph, Martono, & Prasetya (2016) also supports the form of Renewable Energy Edutourism Development and Its Implications for Regional Economic Resilience. The study indicates that PLTH and BIOGAS can be forms of *edutourism* that provide benefits in terms of education, tourism, and the region's economy. To analyze the key factors influencing the behavior of renewable energy consumers, a theoretical model of perception and attitude based on the extension of the TAM (Technology Acceptance Model) is used. The results of this study are helpful for governments, policymakers, and providers of renewable energy services for the successful development of their services.

A person's choice to voluntarily accept new technology is known as technology acceptance. In the implementation that is considered successful in the use of technology, the user's will becomes an important factor. However, the TAM technology acceptance model proposed by Davis (1989) represents the most suitable and substantial technological foundation for its acceptance. TAM, which comes from sociology and psychology, is the most frequently used model in various studies. The main purpose of TAM is to forecast the adoption of new technologies among users and highlight the design issues of information systems before their use becomes prevalent in society. TAM consists of two main constructs: perceived ease of use and perceived usefulness used in various technological contexts. In the perception variable, this research discusses the convenience related to renewable energy, namely the ease of mastering renewable energy technology, the use of renewable energy makes life easier, and the ease of applying the concept of renewable energy in everyday life. Research results show that TAM's use with its original construction cannot wholly explain perceptions and attitudes. For certain respondents, contexts such as perceptions of renewable energy use and attitudes cannot be adequately explained by several variables. The use of social media in the respondents of this study depends on several social and behavioral factors that are not present in the TAM model. This study found interrelated effects of various social factors such as social and environmental influences that can significantly change user behavior towards acceptance of new technologies. Renewable energy represents better alternative energy for energy service providers in an environment with an alternative power plant. Renewable energy that is relatively easy to use is solar energy (Hasan, 2012). The results show that solar technology is easy to install, operate and maintain. Solar energy is also renewable energy that is easy, cheap, and, most importantly, environmentally friendly. In particular, installing and maintaining solar panels is easy, making it possible for individuals to do their maintenance on the solar panels. In addition, the installation of solar panels is considered more efficient than the use of generators when used for a long period.

Various studies have supported the inclusion of factors such as risk and reliance on the TAM theoretical model to explain the acceptance and integration of IT-based technologies. In this study, the researcher added social media as a part of this acceptance which was integrated into IT-based

technology. The trust factor is considered an important determinant in assessing the acceptance of renewable energy by its consumers. Since the main role of trust is to facilitate various social interactions between community members, trust becomes a significant benchmark used to maintain successful interpersonal relationships, especially in groups or communities that already have renewable energy sources. In using renewable energy, Trust is defined as a dimension that can measure the level of acceptance of renewable energy in a region. In this study, the researcher sees the dimension of trust as belief in the adoption of new technologies placed by end-users related to renewable energy services that can be provided through social media. Users' perceptions of placing their trust in alternative energy technology infrastructure and procedural/usage guarantees can increase respondents' interest in using renewable energy. The researcher sees the trust dimension as the belief in the adoption of new technologies placed by end-users about renewable energy services that can be provided through social media. Users' perceptions of placing their trust in alternative energy technology infrastructure and procedural/usage guarantees can increase respondents' interest in using renewable energy. The researcher sees the trust dimension as the belief in the adoption of new technologies placed by end-users concerning renewable energy services that can be provided through social media. Users' perceptions of placing their trust in alternative energy technology infrastructure and procedural/usage guarantees can increase respondents' interest in using renewable energy.

Based on a review of empirical results, TAM in the context of research on the use of renewable energy, researchers use the operationalization of the most common variables in the TAM concept in studies related to consumer behavior toward renewable energy. Therefore, perceived usefulness, perceived ease of use, facilitating conditions, and usage intentions were selected for this study. Perceived usefulness and perceived ease of use are the most common determinants of technology found in society. Perceived usefulness is generally defined as the degree to which a person believes that using a system or technology will help in improving its performance. In this research, perceived usefulness should be redefined because the usefulness of the system/technology for respondents in this study differs from the previously mentioned definition of perceived usefulness. Respondents feel that using renewable energy will only be helpful if it provides low costs in installing and using renewable energy. Perceived ease of use is defined as the degree to which a person believes that using technology will have minimal effort and cost. Based on this, the researchers found that the group of early adults chose to accept and use renewable energy when they felt that using alternative energy would produce better results when compared to using the energy that is currently being used.

Furthermore, the social influence factor in TAM is one of the factors that encourage respondents to participate in using renewable energy or not. Social influence states that there is a level of trust in other people, such as friends or relatives, making the respondent believe that he should use renewable energy. This study shows that social influence is an attribute that can encourage and prevent respondents from using renewable energy. As one of the attributes of the respondent's environment in this study, social media is an essential element in generating interest in the use of renewable energy. This study extends the basic TAM model by adding variables such as technology anxiety, resistance to change, and privacy concerns. With the advancement of science and technology, it becomes important to explore and understand the willingness of users to adopt new technologies. Technology anxiety can be described as fear when respondents start considering using or starting to use renewable energy that they have never used before.

Technology anxiety is a negative emotional response, and there is a negative relationship between using new systems and technology anxiety. In the context of renewable energy, respondents feel anxious to take advantage of this type of energy. The results showed that this factor could influence the interest in using renewable energy in early adulthood. Technological anxiety can turn into a positive one with the support of social media, which allows respondents to freely seek information about their anxiety if they choose to use renewable energy. Respondents show a positive influence on technology anxiety if it is not balanced with information that is considered able to reduce their anxiety. Social media is chosen by early adult groups as a facility to reproduce the information they need. Information obtained because of anxiety increases consumer attention to this energy production and can generate interest in the use of renewable energy. The results of previous studies show that resistance to technology reduces users' intention to take advantage of new technology. The inclusion or introduction of a new technology system is usually considered to disrupt the work system that has been running so far. In a condition where respondents are forced to use electrical energy services without any alternative, they use the energy voluntarily. However, they will stop using it if the

previous use of electrical energy makes respondents uncomfortable or is deemed to have failed to meet their energy needs. The respondents tend to choose to use alternative energy per the respondent's expectations. Respondents' expectations can be met with tangible evidence in the form of infrastructure buildings built and managed by professionals. There are many conveniences in finding information about alternative energy and solutions to problems that may arise from its use. The group of young adults considers social media a source of this information. They express interest in switching to renewable energy if these two things are considered to be fulfilled optimally.

Next is perceived risk. Perceived risk is defined as a person's perception if he or she decides to take action or activity. The effects of risk and uncertainty cannot be reduced in electric energy from fossil or alternative sources. However, the risks and uncertainties regarding the use of renewable energy also vary. Risk is divided into six types: performance, financial, social, psychological, security and opportunity. In the context of uncertainty and problems related to information on social media, the researcher defines the perceived risk for respondents in terms of psychological, financial, and performance risks. Perception of risks is the perception that renewable energy systems can harm respondents due to the unavailability of adequate information. Psychological risk is the emergence of a perceived threat based on the perception that the use of renewable energy will not result in satisfaction. Financial risk can be defined as the inability to incur costs associated with renewable energy. So renewable energy consumers need to include financial aspects and time losses in risk factors. This is identified in this study as one of the aspects that has a negative effect on interest in using renewable energy. In general, on the attitude variable, it can be concluded that caring for the environment is a good attitude. This recognition is shown by including environmental awareness as one of the curricula in character education (Tamara, 2016). It was explained in the study that the social environment, such as family, school, and community, was very influential in shaping the attitude of caring for the environment. Thus, the positive results depicted in the attitude of the people who view the use of renewable energy favorably and begin to pay attention to its development result from a supportive social role to maintaining the goodness of the surrounding environment. The influence of perceptions and attitudes on interest in using renewable energy at home, as a driving force for activities and as fuel.

CONCLUSION

The use of renewable energy in Indonesia has great potential to serve almost all electrical energy needs in the territory of Indonesia. Supported by geographical conditions, with around 62% being marine areas, the potential for renewable energy is huge. The use of renewable energy can serve as one of Indonesia's foundations of independent energy. Through this research, the researcher developed a theoretical model based on TAM to see the perceptions and attitudes that could influence the use of renewable energy in the early adult group through social media. This study found that perceived usefulness, perceived ease of use, influence, facilitating conditions, and trust were the main drivers influencing interest in using renewable energy in the early adult group. However, technological anxiety, resistance to technology, and perceived risks can hinder the use of renewable energy. Privacy is not a determinant of interest in using renewable energy and has no significant relationship between privacy and interest in using renewable energy. It can be seen that the early adult group uses social media as a source of renewable energy information and is able to encourage their interest in using renewable energy. The fact of trust is an important determinant of the use of renewable energy. A high level of confidence in renewable energy can significantly increase respondents' use of renewable energy significantly. It is recommended that the government use social media to introduce renewable energy closer to the community so that the national goal of independent energy can be achieved immediately. The focus of its use of social media should also be on increasing awareness and acceptance of renewable energy not only among early adults but also among all stakeholders and policymakers of alternative energy systems. It is also recommended that renewable energy be used in various educational facilities to introduce and encourage the younger generation to use renewable energy. This research is an empirical study that identifies the barriers and drivers of the use of renewable energy from the perspective of a group of young adults in Indonesia based on TAM with additional constructions. The findings in this study can be easily applied to future research for other uses of renewable energy.

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