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# Interaction Between Social Acceptance and Humanistic Green Techno Educational Capability in Supporting Environmentally Friendly Solar Energy Investments in Jember District

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A R T I C L E I N F O

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A B S T R A C T

The development of a dynamic energy system requires adjustments to energy policies that are in line with and receive strong support from human resources in government and society. One of the most effective and sustainable policies is encouraging investment in environmentally friendly infrastructure, such as renewable energy. The potential of solar energy, which is a renewable energy source, offers a solution to the energy crisis experienced by developing countries. In this research, a new concept is proposed which is known as "the interaction between social acceptance and investment readiness (SONVES) as a mediator of green_ Techno Humanistic Education Capability towards solar PV investment readiness". This aims to determine the effect of increasing social acceptance, technology acceptance, environmental awareness, and economic value which are expected to have a positive effect on investment readiness. This research model uses a quantitative descriptive approach to describe the situation objectively using data in the form of numbers. overall investment readiness.



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## INTRODUCTION

Given the many challenges and technological advances, energy systems continue to develop and change (Child & Breyer, 2017). This energy development requires adapting compatible energy policies and getting strong support from human resources (HR) government officials and the community. In a democratic society, public acceptance can influence the passage and success of energy policies to be truly successful. Meanwhile, social perceptions about energy sources greatly influence future energy sustainability (Crowe & Li, 2020).

Among the most effective and sustainable policies are those that encourage investment in environmentally friendly infrastructure, particularly renewable energy, energy storage and electricity grid modernization. Of all renewable energies, solar energy is one of the fastest growing energy sources and can consequently contribute substantially to reducing dependence on fossil fuels and reducing global CO2 emissions (Carlisle et al., 2014). Social acceptance of renewable energy may seem unproblematic, because several studies have revealed that the level of general acceptance of renewable energy, namely solar energy, is quite high due to its positive socio-political perception and acceptance, significantly to meet the goal of reducing CO2 gas emissions to zero by 2050 In addition, analysis of the use of solar energy has shown an efficiency curve with significant cost reductions, making renewable energy the most cost-effective source of new electricity generation (Cousse, 2021). The potential of solar energy provides a solution to the energy crisis problem that occurs in developing countries. This has led to rapid progress in the use of off-grid solar power in several developing countries, for example in Bangladesh (Friebe et al., 2013) (Samad et al., 2013). But not all countries are making rapid progress in utilizing off-grid solar power. One explanation related to the slow growth is the lack of public awareness of the use of solar energy among potential customers.

Studies show that, in general, many rural households around the world are unaware of solar power as an environmentally friendly renewable energy source (Rebane & Barham, 2011). The development of renewable technology which is expected to make a major contribution to dealing with the problem of fossil energy availability needs to consider several things, namely the level of technological readiness (Technology Readiness Level), the level of market readiness (Manufacturing Readiness Level), the level of acceptance readiness, namely regarding the legitimacy of the new product or technology, and the level of organizational readiness (Vik et al., 2021) (Vik et al., (2021).

The results of previous research show that there are differences in research results regarding the orientation of social acceptance towards Solar PV investment readiness. According to Lau et al. (2020), Briguglio & Formosa (2017), Klepacka et al. (2018), and Menyeh (2021), social acceptance is proven to have an influence on investment readiness. Meanwhile, according to Ahn et al. (2021), Bolwig et al. (2020), Jayaraman et al. (2017), and Koirala et al. (2018) social acceptance has no influence on investment readiness.

Based on the background above, it is necessary to have a concept that can contribute to overcoming the gap in empirical research results and accommodate the renewable energy phenomenon that occurs in state electricity companies in

Indonesia. This new concept is a synthesis of the concepts of social influence and investment readiness. The new concept is called "the interaction between social acceptance and investment readiness (SONVES) as a mediator of green Techno Humanistic Educational Capabilities on solar PV investment readiness" which is expected to have a positive effect on Investment Readiness. In introduction clearly explain the nature of the problem, previous work, purpose, and contribution of the paper. Ensure that your paper has been fully proofread before submitting it for publishing.

In Introduction, Authors should state the objectives of the work at the end of introduction section. Before 'the objective, Authors should provide an adequate background, and very short literature survey to record the existing solutions/method, to show which is the best of previous researches, to show the main limitation of the previous researches, to show what do you hope to achieve (to solve the limitation), and to show the scientific merit or novelties of the paper. Avoid a detailed literature survey or a summary of the results. Do not describe literature survey as author by author, but should be presented as group per method or topic reviewed which refers to some literatures.

## THEORETICAL REVIEW

### *Humanistic Concepts in RBV (Resources-Based View) Theory*

The RBV theory basically has several interrelated theories to form a psychological theory, including Evolutionary economics, Evolutionary economic theory (evolutionary theory), value theory (value theory), and acculturation, according to Thorstein Veblen (1857-1929) in MacRoberts & MacRoberts, (1986), Evolutionary economics is a theory that proposes that economic processes evolve and that economic behavior is determined both by individuals and society. In the RBV theory there is also a value theory, according to Richard T. Schaefer and Robert P. Lmm (1998) in Valdarnini et al., (1998) Value is a shared (collective) idea of what is considered important, good, worthy, and desirable, as well as regarding what is considered unimportant, not good, unworthy, and undesirable in terms of culture. Values refer to things that are considered important in human life, whether as individuals or as members of society.

### *Green Techno Education Concept in Human Resources Management (HRM) Theory*

HRM theory has several forming theories to become Human Resources Management (HRM). These theories include Human Capital Management Theory (capital management theory), Knowledge Management Theory (knowledge management theory), and Strategic management (strategic management). The main concept of human capital according to Becker & Gerhart, (1996) is that humans are not just resources but are capital that produces returns and every expenditure made to develop the quality and quantity of that capital is an investment activity.

### *Green Techno Concept in Prospect Theory*

In prospect theory, Kahneman & Tversky (1979) revealed that someone will look for information first and then create several "decision frames" or decision concepts. After a decision concept is made, a person will decide by choosing one of the concepts that produces the greatest expected utility. Prospect theory shows that people who have an irrational tendency are more reluctant to risk profits (gains) than losses (losses), if someone is in a profit position then that person tends to avoid risk or is called risk aversion, whereas if someone is in a loss position then that person tends to to dare to face risks or is called risk seeking.

## METHODOLOGY

### *Research Methodology*

This research model uses a quantitative descriptive research model. Where the quantitative descriptive research method is a method that aims to create a picture or description of a situation objectively using numbers, starting from data collection, interpretation of the data as well as the appearance and results.

### *Types and Sources of Research Data*

The object of this research is the village structural organization which is the Pandalungan community in the Jember Regency area. The type of data in this documentary is data in the form of questionnaires and interviews. The data used in this research is primary data collected through research surveys and interviews. The objects of observation in this research are the people of Jember Regency who have positions in village organizations or as village officials where one village is represented by one village official. There are 5 alternative answers given according to the Likert scale, namely 1 = Strongly Disagree (STS), 2 = Disagree (TS), 3 = Somewhat Agree (KS), 4 = Agree (S), and 5 = Strongly Agree (SS).

### *Population*

A population is a collection of objects that have certain predetermined qualities and characteristics. Population is a generalization area consisting of objects or subjects that have certain qualities and characteristics determined by researchers to be studied and then conclusions drawn (Adha et al., 2020). The population in this research is the Pandalungan community in the Jember area.
Sample

According to Mindang et al. (2017), the sample is part of the number of characteristics possessed by the population. Sampling was carried out with the consideration that the existing population was very large, so it was not possible to examine the entire existing population, so a representative population was formed. The population in this research is all 248 villages in Jember Regency, with village officials being the target population. To obtain the number of villages selected as samples, a simple random sampling method was used with the following calculations:

$$n = \frac{Npq}{(N-1)D+pq} \text{ with } D = \frac{B^2}{4}$$

Information:
n: Number of villages in the sample
N: Number of populations
p: Proportion of villages ready to accept solar PV investment. There is no prior information set the p value = 0.5
q: Proportion of villages that are not ready to accept solar PV investment. There is no prior information. so, it is set to q=0.5
B: Fault tolerance limit. In this study it was determined to be 0.05.

Based on the calculation results, it was found that there were 154 villages in the sample. The selection of sample villages was carried out randomly using computer assistance. Apart from using simple random sampling to determine the number of villages to be sampled, this research also used purposive sampling, namely taking samples based on certain objectives/criteria. The sampling criteria in this research were Jember Regency people who had positions in village organizations or as village officials. As a research limitation, one village will be represented by one selected village official for interviews and filling out questionnaires.

Method of collecting data

In this research, data collection methods used questionnaires and interviews. The data collection instrument used is a questionnaire, which can contain several written questions with the aim of collecting information about the respondent's experience and knowledge. The problem in this research is formulated into a simultaneous model, namely a model formed using more than one dependent variable which is explained by one or several independent variables, where a dependent variable at the same time will act as an independent variable for other tiered relationships. The independent variables in this research consist of social acceptance (X1) which consists of 8 indicators, technology acceptance (X2) which consists of 9 indicators, environmental concern (X3) which consists of 10 indicators, and economic value (X4) which consists of 10 indicators. The dependent variable in this research is solar investment readiness (Y1) which consists of 10 indicators. Meanwhile, the moderating variable in this research is the green techno humanistic educational ability which consists of 10 indicators.

Research Data Analysis Techniques

The data analysis technique in this research begins with preparing a theory-based conceptual model, namely a measurement model (outer model) and a structural model (outer model). After forming a conceptual framework, the next step is to construct a path diagram which is continued by converting the path diagram into a mathematical equation. Next, parameter estimation was carried out in PLS using the Ordinary Least Square method approach using PLS with the algorithm as shown in Figure 1. After that, the measurement model and structural model were evaluated, followed by hypothesis testing.

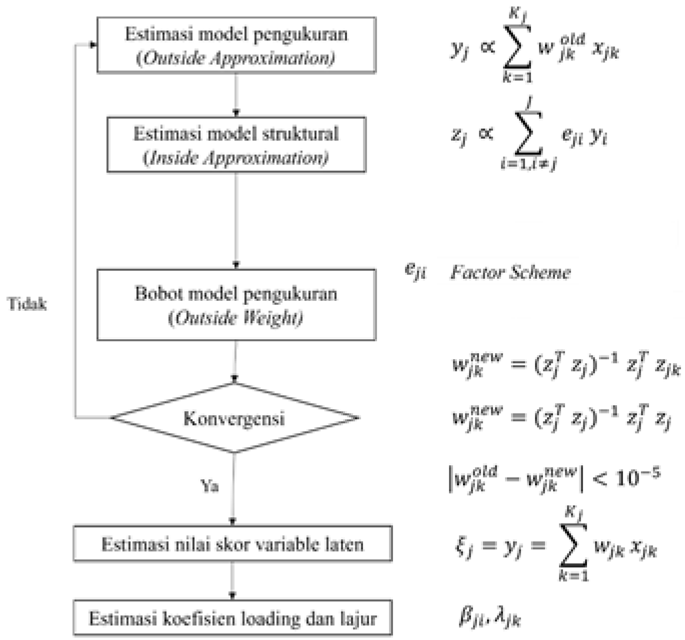


Figure 1. PLS Algorithm Flow Diagram

## RESULTS

### *Instrument Validity*

The technique for testing the validity of the instrument in this research is using bivariate Pearson correlation values. The instrument item will be considered valid if rcount > rtable(α/2,n-2) with rtable(0.05,152) of 0.1330. The results of the validity test of the indicators for the research variables show that all instruments for each variable X1, X2, X3, X4, Y1, dan Y2 has a calculated rcount > 0.1330, which means the instrument is valid for further analysis.

### *Instrument Reliability*

In this research, the reliability test was carried out using the Cronbach's Alpha test with the results of all variables having an alpha value between 0.70 – 0.90 so it can be said that all variables are reliable and reliable for use in further analysis.

Path Diagram Construction (Path Diagram)

The model structure built in this research consists of 4 exogenous latent variables, namely social acceptance ($\xi_1$ ), technology acceptance ($\xi_2$ ) environmental concern ($\xi_3$ ) economic value ($\xi_4$ ) and 2 endogenous variables, namely humanistic green techno educational ability ($\eta_1$) and readiness to accept solar PV investment ($\eta_2$). It is assumed that $\eta_1$ depends on $\xi_1$,$\xi_2$,$\xi_3$,$\xi_4$, and $\eta_2$ depends on $\eta_1$, $\xi_3$,$\xi_4$. Mathematically it can be described in the following equation. The exogenous latent variable $\xi_1$, namely social acceptance, consists of 8 indicators, the latent variable technology acceptance ($\xi_2$ ) is measured using 9 indicators, the environmental concern latent variable (($\xi_3$ )) consists of 10 indicators, the economic latent variable ($\xi_4$ ) is measured using 10 indicators, the endogenous latent variable humanistic green techno education ability ($\eta_1$)

consists of 10 indicators and the endogenous latent variable readiness to accept solar PV investment (η_2) consists of 10 indicators. After the research conceptual framework is formed, the next step is to construct a path diagram as follows:

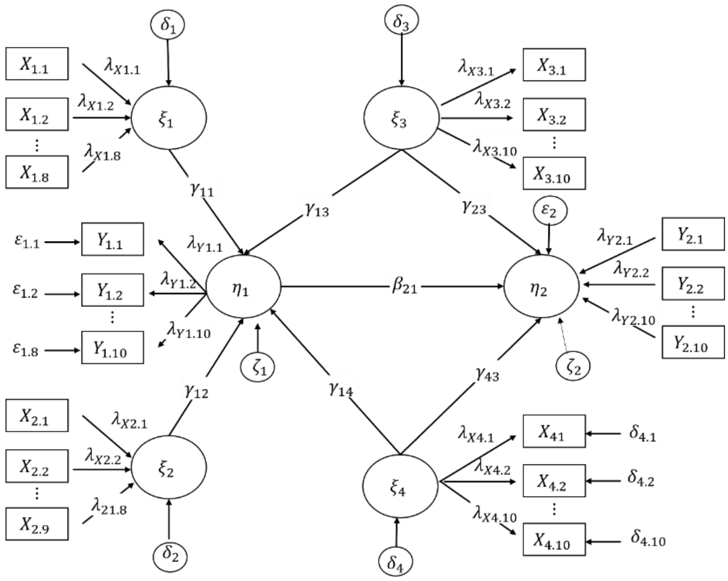

Figure 2. Conceptual Path Diagram

Based on Figure 2, variable x is an indicator for the exogenous latent variable (ξ) and variable y is an indicator for the endogenous latent variable (η). The variable λ is a loading value that describes the relationship between the latent variable and its indicators. The residual or measurement error/noise for the outer model is measured in δ and ε values, while the residual for the inner model is expressed in ζ values.

***Measurement Model (Outer Model)***

The measurement model (outer model) is used to describe the relationship between latent variables and their indicators. The model is composed of reflective indicators and formative indicators. The measurement model equation for each latent variable can be seen in the following table:

Table 1. The measurement Model Equation

| | Latent Variables | Indicator Type | Equality | |
|---|---|---|---|---|
| Exogenous Latent Variables | Social acceptance ($\xi_1$) | Formative | $\xi_1 = \lambda_{X1.1}X_{1.1} + \lambda_{X1.2}X_{1.2} + \cdots + \lambda_{X1.8}X_{1.8} + \delta_1$ | |
| | Technology acceptance ($\xi_2$) | Formative | $\xi_2 = \lambda_{X2.1}X_{2.1} + \lambda_{X2.2}X_{2.2} + \cdots + \lambda_{X2.9}X_{1.9} + \delta_2$ | |
| | Environmental concern($\xi_3$) | Reflective | $x_{3.1} = \lambda_{X3.1}\xi_3 + \delta_{3.1}$ | $x_{3.6} = \lambda_{X3.6}\xi_3 + \delta_{3.6}$ |

| | | | | |
|---|---|---|---|---|
| | | | $x_{3.2} = \lambda_{X3.2}\xi_3 + \delta_{3.2}$ | $x_{3.7} = \lambda_{X3.7}\xi_3 + \delta_{3.7}$ |
| | | | $x_{3.3} = \lambda_{X3.3}\xi_3 + \delta_{3.3}$ | $x_{3.8} = \lambda_{X3.8}\xi_3 + \delta_{3.8}$ |
| | | | $x_{3.4} = \lambda_{X3.4}\xi_3 + \delta_{3.4}$ | $x_{3.9} = \lambda_{X3.9}\xi_3 + \delta_{3.9}$ |
| | | | $x_{3.5} = \lambda_{X3.5}\xi_3 + \delta_{3.5}$ | $x_{3.10} = \lambda_{X3.10}\xi_4 + \delta_{3.10}$ |
| | Economic value ($\xi_4$) | Reflective | $x_{4.1} = \lambda_{X4.1}\xi_4 + \delta_{4.1}$ | $x_{4.6} = \lambda_{X4.6}\xi_4 + \delta_{4.6}$ |
| | | | $x_{4.2} = \lambda_{X4.2}\xi_4 + \delta_{4.2}$ | $x_{4.7} = \lambda_{X4.7}\xi_4 + \delta_{4.7}$ |
| | | | $x_{4.3} = \lambda_{X4.3}\xi_4 + \delta_{4.3}$ | $x_{4.8} = \lambda_{X4.8}\xi_4 + \delta_{4.8}$ |
| | | | $x_{4.4} = \lambda_{X4.4}\xi_4 + \delta_{4.4}$ | $x_{4.9} = \lambda_{X4.9}\xi_4 + \delta_{4.9}$ |
| | | | $x_{4.5} = \lambda_{X4.5}\xi_4 + \delta_{4.5}$ | $x_{4.10} = \lambda_{X4.10}\xi_4 + \delta_{4.10}$ |
| Endogenous Latent Variables | humanistic green techno educational capabilities ($\eta_1$) | Reflective | $y_{1.1} = \lambda_{Y1.1}\eta_1 + \varepsilon_{1.1}$ | $y_{1.6} = \lambda_{Y1.6}\eta_1 + \varepsilon_{1.6}$ |
| | | | $y_{1.2} = \lambda_{Y1.2}\eta_1 + \varepsilon_{1.2}$ | $y_{1.7} = \lambda_{Y1.7}\eta_1 + \varepsilon_{1.7}$ |
| | | | $y_{1.3} = \lambda_{Y1.3}\eta_1 + \varepsilon_{1.3}$ | $y_{1.8} = \lambda_{Y1.8}\eta_1 + \varepsilon_{1.8}$ |
| | | | $y_{1.4} = \lambda_{Y1.4}\eta_1 + \varepsilon_{1.4}$ | $y_{1.9} = \lambda_{Y1.9}\eta_1 + \varepsilon_{1.9}$ |
| | | | $y_{1.5} = \lambda_{Y1.5}\eta_1 + \varepsilon_{1.5}$ | $y_{1.10} = \lambda_{Y1.10}\eta_1 + \varepsilon_{1.10}$ |
| | readiness to accept solar PV investment ($\eta_2$) | Formative | $\eta_2 = \lambda_{Y2.1}Y_{2.1} + \lambda_{Y2.2}Y_{2.2} + \cdots + \lambda_{Y2.10}Y_{2.10} + \varepsilon_2$ | |

***Structural Model (Inner Model)***

Structural models are used to describe the relationships between latent variables, or what can also be called inner relation. Mathematically, the structural model has the following functional equation.

η_1=f(ξ_1,ξ_2,ξ_3,ξ_4)
η_1=f(η_1,ξ_3,ξ_4)
These functions can be described as follows.
η_1=γ_11 ξ_1+γ_12 ξ_2+γ_13 ξ_3+γ_14 ξ_4+ζ_1
η_2=β_21 η_1+γ_13 ξ_3+γ_14 ξ_4+ζ_2

Parameter Estimation of Measurement Models and Structural Models

Estimation of measurement model parameters was carried out using a partial least squares (PLS) approach and through an iterative procedure. In this research, to obtain estimates of model parameter coefficients using a factor scheme. The results of estimating parameter coefficients for each scheme can be explained as follows:

Estimation of Measurement Model Parameter Coefficients (λ)

The estimated value of the measurement model parameter coefficient (λ) for exogenous latent variables and endogenous latent variables in the factor scheme can be explained as follows:

Table 2. Coefficients for exogenous and endogenous latent variables

| Exogenous Latent Variables | | | | Endogenous Variables | |
|---|---|---|---|---|---|
| X1 | X2 | X3 | X4 | Y1 | |
| $\lambda_{X1.1}$ = -0.014 | $\lambda_{X2.1}$ = 0.271 | $\lambda_{X3.1}$ = 0.667 | $\lambda_{X4.1}$ = 0.773 | $\lambda_{Y1.1}$ = -0.115 | 0.2 |
| $\lambda_{X1.2}$ = 0.630 | $\lambda_{X2.2}$ = 0.060 | $\lambda_{X3.2}$ = 0.758 | $\lambda_{X4.2}$ = 0.795 | $\lambda_{Y1.2}$ = 0.174 | 0.2 |
| $\lambda_{X1.3}$ = 0.069 | $\lambda_{X2.3}$ = 0.068 | $\lambda_{X3.3}$ = 0.793 | $\lambda_{X4.3}$ =0.726 | $\lambda_{Y1.3}$ = 0.113 | -0. |
| $\lambda_{X1.4}$ = -0.290 | $\lambda_{X2.4}$ = 0.114 | $\lambda_{X3.4}$ = 0.773 | $\lambda_{X4.4}$ = 0.638 | $\lambda_{Y1.4}$ = -0.018 | -0. |
| $\lambda_{X1.5}$ = 0.449 | $\lambda_{X2.5}$ = 0.166 | $\lambda_{X3.5}$ = 0.810 | $\lambda_{X4.5}$ = 0.642 | $\lambda_{Y1.5}$ = 0.225 | 0.3 |
| $\lambda_{X1.6}$ = -0.004 | $\lambda_{X2.6}$ = 0.324 | $\lambda_{X3.6}$ = 0.671 | $\lambda_{X4.6}$ = 0.654 | $\lambda_{Y1.6}$ = -0.114 | 0.1 |
| $\lambda_{X1.7}$ = 0.254 | $\lambda_{X2.7}$ = 0.091 | $\lambda_{X3.7}$ = 0.668 | $\lambda_{X4.7}$ = 0.501 | $\lambda_{Y1.7}$ = 0.004 | 0.1 |
| $\lambda_{X1.8}$ = 0.309 | $\lambda_{X2.8}$ = 0.480 | $\lambda_{X3.8}$ = 0.708 | $\lambda_{X4.8}$ = 0.552 | $\lambda_{Y1.8}$ = 0.264 | 0.2 |
| | $\lambda_{X2.9}$ = 0.114 | $\lambda_{X3.9}$ = 0.663 | $\lambda_{X4.9}$ = 0.539 | $\lambda_{Y1.9}$ = 0.360 | 0.2 |
| | | $\lambda_{X3.10}$ =0.729 | $\lambda_{X4.10}$ = 0.489 | $\lambda_{Y1.10}$ = 0.503 | -0. |

Estimation of Structural Model Parameter Coefficients (β and γ)

The estimated coefficient values of structural model parameters (β and γ) for exogenous latent variables and endogenous latent variables in the factor scheme are as follows: : $\gamma_{11}$ = 0.286, $\gamma_{12}$ = 0.266, $\gamma_{13}$ = 0.243, $\gamma_{14}$ = 0.257, $\gamma_{21}$ = 0.392, $\gamma_{23}$ = 0.243, dan $\gamma_{24} = 0.184$.

Evaluation of the Measurement Model (Outer Model)

Evaluation of the measurement model will be carried out on the reflective model and formative model for the factor scheme.

***Evaluation of Reflective Measurement Models***

Evaluation of the measurement model with a reflective model will be carried out by testing the validity and reliability for each indicator of the latent variable.

a. Convergent Validity of Factor Schemes

Validity is a value for measuring the relationship/correlation between reflexive indicators and latent variables. This evaluation is carried out by looking at the value of the loading factor. An indicator will be said to be valid if it has a loading factor > 0.70, while a loading factor value < 0.40 will be removed from the model. However, a loading factor with a value between 0.40 – 0.70 must still be maintained. There is a procedure for making decisions to maintain or delete reflective indicators for loading factors with values between 0.40 – 0.70, namely retaining reflective indicators if the indicators are removed from the model but do not increase the AVE and composite reliability above the limits, 2) Removing reflective indicators if when the indicator is removed from the model and the AVE value and composite reliability increase above the limit (Hart, 2022). The results of the validity evaluation with the loading factor values for the factors for each indicator in the latent variable of the reflective model are as follows.

Table 3. Loading Factor Values for Reflective Indicators in the Factor Scheme

| **Latent Variable Environmental Concern (X3)** | | | **Latent Variable of Economic Value (X4)** | | |
|---|---|---|---|---|---|
| **Indicator** | ***Loading Factor*** | **Information** | **Indicator** | ***Loading Factor*** | **Information** |
| X3.1 | 0.671 | Retained in the model | X4.1 | 0.831 | Valid |
| X3.2 | 0.762 | Valid | X4.2 | 0.814 | Valid |
| X3.3 | 0.793 | Valid | X4.3 | 0.783 | Valid |
| X3.4 | 0.776 | Valid | X4.4 | 0.605 | Retained in the model |
| X3.5 | 0.808 | Valid | X4.5 | 0.671 | Retained in the model |
| X3.6 | 0.666 | Retained in the model | X4.6 | 0.640 | Retained in the model |
| X3.7 | 0.670 | Retained in the model | | | |

| **Latent Variable Environmental Concern (X3)** | | | **Latent Variable of Economic Value (X4)** | | |
|---|---|---|---|---|---|
| **Indicator** | ***Loading Factor*** | **Information** | **Indicator** | ***Loading Factor*** | **Information** |
| X3.8 | 0.709 | Valid | | | |
| X3.9 | 0.659 | Retained in the model | | | |
| X3.10 | 0.729 | Valid | | | |

All indicators in the latent variable X3 are retained in the model because the AVE and composite reliability values are more than the threshold. Meanwhile, the AVE and composite reliability values for the latent variable X4 are still below the limit, so the indicator with the smallest loading value is removed from the model. Successively, the indicators X4.10, X4.7, X4.9, X4.8 removed from the model, until the result of the AVE and composite reliability values is more than the threshold.

b. Discriminant Validity of Factor Schemes

The Cross Loading value for reflective indicators in the path scheme (factor scheme) can be explained as follows:

Table 4. Cross Loading Values of Reflective Indicators for Scheme Factors

| | X1 | X2 | X3 | X4 | Y1 | Y2 |
|---|---|---|---|---|---|---|
| X3.1 | 0.563 | 0.483 | 0.671 | 0.516 | 0.536 | 0.516 |
| X3.2 | 0.560 | 0.421 | 0.762 | 0.596 | 0.613 | 0.531 |
| X3.3 | 0.457 | 0.491 | 0.793 | 0.532 | 0.609 | 0.516 |
| X3.4 | 0.544 | 0.469 | 0.776 | 0.546 | 0.575 | 0.556 |
| X3.5 | 0.580 | 0.431 | 0.808 | 0.637 | 0.675 | 0.597 |
| X3.6 | 0.473 | 0.576 | 0.666 | 0.512 | 0.601 | 0.489 |
| X3.7 | 0.494 | 0.411 | 0.67 | 0.563 | 0.502 | 0.474 |
| X3.8 | 0.597 | 0.366 | 0.709 | 0.63 | 0.552 | 0.474 |
| X3.9 | 0.457 | 0.435 | 0.659 | 0.495 | 0.556 | 0.386 |
| X3.10 | 0.437 | 0.388 | 0.726 | 0.628 | 0.615 | 0.500 |

| | X1 | X2 | X3 | X4 | Y1 | Y2 |
|---|---|---|---|---|---|---|
| X4.1 | 0.511 | 0.330 | 0.632 | 0.831 | 0.570 | 0.588 |
| X4.2 | 0.617 | 0.399 | 0.767 | 0.814 | 0.708 | 0.499 |
| X4.3 | 0.474 | 0.299 | 0.556 | 0.783 | 0.561 | 0.579 |
| X4.4 | 0.352 | 0.200 | 0.479 | 0.605 | 0.399 | 0.321 |
| X4.5 | 0.379 | 0.226 | 0.449 | 0.671 | 0.429 | 0.473 |
| X4.6 | 0.427 | 0.300 | 0.479 | 0.64 | 0.476 | 0.422 |

Based on Table 4, the loading factor for each indicator has the largest value for the targeted latent variable compared to other latent variables. This indicates that the measurement model for the reflective schema factor model has good discriminant validity.

Reliability

The next evaluation is to check the reliability of the reflective model latent variables. A latent variable will be said to be reliable if the value of Composite Reliability is ≥ 0.70. The value of Composite Reliability for the factor scheme is X3 = 0.917 and X4 is 0.870. Based on these values, it is known that the latent variables X3 and X4 have fulfilled the rule of thumb so that the latent variables for the factor scheme are reliable.

Evaluation of Measurement Models for Formative Factor Scheme Models

Evaluation of the measurement model for the formative model is carried out by obtaining the regression coefficient values and their significance. The initial hypothesis (H0) tested is λ_i=0 (loading factor for the formative model is not significant) while the alternative hypothesis (H1) adalah λ_i≠0 (loading factor for the formative model is significant). The statistical test used is the t statistical test with the formula t=(λ_i )⁄(SE((λ_i )^). )A decision to reject H0 will be obtained if the statistical test t > t_((α))with α is a significant level of 10%, so that t_((α))=1.645 is obtained. Based on the test results, significant outer weights will be retained in the model, while those that are not significant will be retained or removed from the model. Next, a procedure will be carried out to maintain indicators with outer weight values > 0.5 or be removed from the model.

Table 5. Results of Evaluation of Formative Factor Scheme Indicators

| | **Conclusion Outer Weight** | **Outer Loading** | ***t-statistics*** | **Information** |
|---|---|---|---|---|
| X1.1 → X1 | Not significant | 0.617 | 4.776 | Maintained |
| X1.2 → X1 | Significant | 0.762 | 8.766 | Maintained |
| X1.3 → X1 | Not significant | 0.491 | 2.967 | Maintained |
| X1.4 → X1 | Significant | 0.172 | 1.398 | Maintained |
| X1.5 → X1 | Significant | 0.524 | 5.721 | Maintained |
| X1.6 → X1 | Not significant | 0.380 | 2.633 | Maintained |
| X1.7 → X1 | Not significant | 0.542 | 4.182 | Maintained |
| X1.8 → X1 | Significant | 0.559 | 6.212 | Maintained |
| X2.1 → X2 | Significant | 0.543 | 5.236 | Maintained |
| X2.2 → X2 | Not significant | 0.497 | 4.145 | Maintained |
| X2.3 → X2 | Not significant | 0.218 | 1.045 | Removed from model |
| X2.4 → X2 | Not significant | 0.569 | 5.563 | Maintained |
| X2.5 → X2 | Not significant | 0.559 | 4.195 | Maintained |

| | | | | |
|---|---|---|---|---|
| X2.6 → X2 | Significant | 0.567 | 4.156 | Maintained |
| X2.7 → X2 | Not significant | 0.574 | 4.102 | Maintained |
| X2.8 → X2 | Significant | 0.773 | 8.163 | Maintained |
| X2.9 → X2 | Not significant | 0.367 | 2.336 | Maintained |
| Y1.1 → Y1 | Not significant | 0.326 | 2.093 | Maintained |
| Y1.2 → Y1 | Significant | 0.368 | 3.281 | Maintained |
| Y1.3 → Y1 | Not significant | 0.290 | 3.267 | Maintained |
| Y1.4 → Y1 | Not significant | 0.412 | 4.719 | Maintained |
| Y1.5 → Y1 | Significant | 0.500 | 3.451 | Maintained |
| Y1.6 → Y1 | Significant | 0.422 | 4.088 | Maintained |
| Y1.7 → Y1 | Not significant | 0.601 | 7.141 | Maintained |
| Y1.8 → Y1 | Significant | 0.772 | 9.982 | Maintained |
| Y1.9 → Y1 | Significant | 0.800 | 9.035 | Maintained |
| Y1.10 → Y1 | Significant | 0.772 | 12.397 | Maintained |
| Y2.1 → Y2 | Significant | 0.623 | 6.804 | Maintained |
| Y2.2 → Y2 | Significant | 0.730 | 7.488 | Maintained |
| Y2.3 → Y2 | Not significant | 0.572 | 4.805 | Maintained |
| Y2.4 → Y2 | Not significant | 0.643 | 5.128 | Maintained |
| Y2.5 → Y2 | Significant | 0.851 | 14.87 | Maintained |
| Y2.6 → Y2 | Not significant | 0.768 | 8.201 | Maintained |
| Y2.7 → Y2 | Not significant | 0.740 | 7.602 | Maintained |
| Y2.8→ Y2 | Significant | 0.816 | 10.922 | Maintained |
| Y2.9 → Y2 | Significant | 0.652 | 5.149 | Maintained |
| Y2.10 → Y2 | Not significant | 0.449 | 3.760 | Maintained |

Based on Table 3.36, it is known that the indicator X2.3 will be removed from the model because it has an outer weight value that is not significant, an outer loading that is <0.50 and is not significant.

The next evaluation of the formative model is to detect whether there are cases of multicollinearity in the indicators in the latent variable. To detect multicollinearity, you can use the value of the variance inflation factor (VIF). A VIF value above 5 indicates that there is multicollinearity in a formative latent variable. The test results showed that the VIF value was less than 5 for each indicator so that multicollinearity was not detected. Apart from that, you can also find out the VIF values for latent variables by using the inner VIF values listed in Table 6 below:

Table 6. Inner VIF Value

| | Y1 | Y2 |
|---|---|---|
| X1 | 2.202 | |
| X2 | 1.727 | |
| X3 | 3.836 | 3.614 |
| X4 | 2.744 | 2.749 |
| Y1 | | 2.979 |
| Y2 | | |

***Structural Model Evaluation***

Structural model evaluation was carried out to determine the relationship between latent variables. The measures used to evaluate the structural model are the coefficient of determination (R-square) value for the endogenous latent variable and the Q-square predictive relevance value. The measurement values for the scheme factor can be seen as follows.

Table 7. R-square and Q-square values for scheme factors

| | | *Factor Scheme* |
|---|---|---|
| $R_1^2$ | Y1 | **0.774** |
| $R_2^2$ | Y2 | 0.573 |
| $Q_1^2$ | Y1 | **0.211** |
| $Q_2^2$ | Y2 | **0.227** |

Based on table 7, the R_1^2 value of the factor scheme is 0.778, meaning that the variation in the green techno humanistic educational ability variable can be explained by 77.8% by the variable's social acceptance, technology acceptance, environmental concern, and economic value while the remaining 22.2% is explained by the variables others that are not hypothesized in the research model. The Q^2value of the factor scheme is 0.213. This means that the greater the value of Q^2, the better it is for making predictions so that the factor scheme produces the best model for making predictions.

***Hypothesis test***

Hypothesis testing in PLS is carried out using bootstrap resampling with the test statistic used is the t test statistic. Tests will be carried out to test the parameters λ,β,γ.

***Measurement Model Hypothesis Testing***

In this stage, the significance of the parameter λ will be tested for the measurement model with the best scheme, namely the factor scheme. The hypothesis used is λ_i=0 (loading factor is not significant) while the alternative hypothesis (H1) is λ_i≠0 (loading factor is significant). The test statistics used are as follows: t=(λ_i )⁄(SE((λ_i ) ̂)).

Reject H0 if the t test statistic t > t_α with a significance level set at α=10% so that t_0.1=1.645 is obtained.

Table 8. Measurement Model Test Results

| Latent Variables | Indicator | Coefficient | *t-statistics* | Latent Variables | Indicator | Coefficient | *t-statistics* |
|---|---|---|---|---|---|---|---|
| | X1.1 | 0.617 | 4.831 | | X4.1 | 0.83 | 12.384 |
| | X1.2 | 0.763 | 8.728 | | X4.2 | 0.814 | 17.521 |
| X1 | X1.3 | 0.487 | 3.100 | X4 | X4.3 | 0.783 | 10.596 |
| | X1.4 | 0.17 | 1.406 | | X4.4 | 0.606 | 3.624 |
| | X1.5 | 0.521 | 6.139 | | X4.5 | 0.671 | 4.587 |
| | X1.6 | 0.378 | 2.547 | | X4.6 | 0.64 | 5.953 |
| | X1.7 | 0.541 | 4.218 | Y1 | Y1.1 | 0.325 | 2.131 |
| | X1.8 | 0.562 | 5.820 | | Y1.2 | 0.366 | 3.554 |
| | X2.1 | 0.544 | 5.313 | | Y1.3 | 0.297 | 3.428 |
| | X2.2 | 0.502 | 4.301 | | Y1.4 | 0.419 | 4.495 |
| | X2.4 | 0.574 | 5.410 | | Y1.5 | 0.496 | 3.738 |
| | X2.5 | 0.564 | 3.993 | | Y1.6 | 0.418 | 4.256 |
| X2 | X2.6 | 0.566 | 4.010 | | Y1.7 | 0.601 | 7.042 |
| | X2.7 | 0.58 | 4.451 | | Y1.8 | 0.77 | 10.142 |
| | X2.8 | 0.776 | 8.605 | | Y1.9 | 0.8 | 9.003 |
| | X2.9 | 0.369 | 2.368 | | Y1.10 | 0.775 | 13.628 |
| | X3.1 | 0.67 | 6.998 | Y3 | Y2.1 | 0.621 | 7.308 |
| | X3.2 | 0.761 | 10.852 | | Y2.2 | 0.73 | 7.459 |
| | X3.3 | 0.793 | 29.294 | | Y2.3 | 0.571 | 4.553 |
| | X3.4 | 0.776 | 15.440 | | Y2.4 | 0.642 | 4.821 |
| | X3.5 | 0.808 | 24.542 | | Y2.5 | 0.852 | 13.717 |
| X3 | X3.6 | 0.667 | 12.271 | | Y2.6 | 0.769 | 7.644 |
| | X3.7 | 0.669 | 7.9790 | | Y2.7 | 0.742 | 7.381 |
| | X3.8 | 0.709 | 12.220 | | Y2.8 | 0.816 | 10.365 |
| | X3.9 | 0.659 | 11.427 | | Y2.9 | 0.651 | 5.061 |
| | X3.10 | 0.726 | 10.534 | | Y2.10 | 0.449 | 4.098 |

Based on Table 8, it is known that all t-statistics values for each indicator have values greater than t0.1=1.645 except for the indicator X1.4. This means that all indicators have a significant effect on the latent variable except indicator X1.4.

***Structural Model Hypothesis Testing***

Structural model hypothesis testing is used to determine whether the parameters γ and β are significant to the model. The hypothesis used to test the structural model is as follows:

Table 9. Measurement Model Test Results.

| No | Latent Variables | hypothesis |
|---|---|---|
| 1 | Hypothesis for testing the latent variable of social acceptance ($\xi_1$) with the latent variable of humanistic green techno educational ability ($\eta_1$) | $H_0$: $\gamma_{11} = 0$ $H_1$: $\gamma_{11} \neq 0$ |
| 2 | Hypothesis for testing the latent variable of technology acceptance ($\xi_2$) with the latent variable of humanistic green techno educational ability ($\eta_1$) | $H_0$: $\gamma_{12} = 0$ $H_1$: $\gamma_{12} \neq 0$ |
| 3 | Hypothesis for testing the latent variable environmental concern ($\xi_3$) with the latent variable humanistic green techno educational ability ($\eta_1$) | $H_0$: $\gamma_{13} = 0$ $H_1$: $\gamma_{13} \neq 0$ |
| 4 | Hypothesis for testing the latent variable of economic value ($\xi_4$) with the latent variable of humanistic green techno educational ability ($\eta_1$) | $H_0$: $\gamma_{14} = 0$ $H_1$: $\gamma_{14} \neq 0$ |
| 5 | Hypothesis for testing the latent variable environmental concern ($\xi_3$) with the latent variable readiness to accept solar PV investment ($\eta_2$) | $H_0$: $\gamma_{23} = 0$ $H_1$: $\gamma_{23} \neq 0$ |
| 6 | Hypothesis for testing the latent variable economic value ($\xi_4$) with the latent variable readiness to accept solar PV investment ($\eta_2$) | $H_0$: $\gamma_{43} = 0$ $H_1$: $\gamma_{43} \neq 0$ |
| 7 | Hypothesis for testing the latent variable of humanistic green techno education ability ($\eta_1$) with the latent variable of readiness to accept solar PV investment ($\eta_2$) | $H_0$: $\beta_{21} = 0$ $H_1$: $\beta_{21} \neq 0$ |

Hypothesis testing was carried out using the bootstrap resampling procedure. The application of bootstrap resampling allows data not to follow a normal distribution or a certain distribution and does not require a large sample. The test statistic used is the t test statistic. The initial hypothesis (H0) will be rejected if the t-statistics is greater than t(α) with a significance level (α) of 10%, so that t(0,1) is 1.645.

Table 10. Structural Model Test Results

| | Coefficient | Standard Deviation | t-statistics |
|---|---|---|---|
| X1 → Y1 | 0.281 | 0.071 | 3.972 |
| X2 → Y1 | 0.261 | 0.063 | 4.156 |
| X3 → Y1 | 0.255 | 0.071 | 3.601 |
| X3 → Y2 | 0.220 | 0.114 | 1.928 |
| X4 → Y1 | 0.247 | 0.068 | 3.609 |
| X4 → Y2 | 0.218 | 0.1 | 2.174 |
| Y1 → Y2 | 0.382 | 0.115 | 3.333 |

Based on the test results, all latent variables have a t test statistical value > 1.645, meaning that all latent variables have a significant effect on the equation model. The structural equation model can be formed as follows.

$\eta_1=0.283\xi_1+0.272\xi_1+0.237\xi_3+0.256\xi_4+\zeta_1$

$\eta_2=0.220\xi_3+0.219\xi_4+0.381\beta_1+\zeta_2$

**DISCUSSION**

The results of the test can be explained as follows:

Social acceptance ($\xi_1$) has a positive and significant effect on the ability of humanistic green techno education ($\eta_1$). This means that the higher the social acceptance that occurs, the higher the influence on the ability of green techno humanistic education. Technology acceptance ($\xi_2$) has a positive and significant effect on the ability of humanistic green techno education ($\eta_1$). This means that the higher the acceptance of technology, the higher the influence on the ability of green techno humanistic education.

Environmental concern ($\xi_3$) has a positive and significant effect on the ability of humanistic green techno education ($\eta_1$). This means that the higher the environmental awareness, the higher the influence on the ability of green techno humanistic education. Economic value ($\xi_4$) has a positive and significant effect on the ability of humanistic green techno education ($\eta_1$). This means that the higher the economic value, the higher the influence on the ability of green techno humanistic education.

Environmental concern ($\xi_3$) has a positive and significant effect on readiness to accept solar PV investment ($\eta_2$). This means that the higher the environmental concern, the higher the influence on solar PV investment readiness. Economic value ($\xi_4$) has a positive and significant effect on readiness to accept solar PV investment ($\eta_2$). This means that the higher the influence of economic value, the higher the influence on solar PV investment readiness.

The ability of humanistic green techno education (η_1) has a positive and significant effect on the readiness to accept solar PV investment (η_2). This means that the higher the influence of Green Techno Humanistic Education capabilities, the higher the influence on solar PV investment readiness. A mediating variable is a variable that is between/intervening a latent variable with another latent variable. Based on the model, it is known that green techno humanistic educational ability (Y1) is a mediating variable between social acceptance (X1) and readiness to accept solar PV investment (Y2), technology acceptance (X2) and readiness to accept solar PV investment (Y2), environmental concern (X3) with readiness to accept solar PV investment (Y2), and economic value (X4) with readiness to accept solar PV investment (Y2). Based on the test results, the coefficient values and test statistics for indirect effects are obtained as follows.

Table 11. Mediation Model Test Results

| | **Coefficient** | **Standard Deviation** | **t-statistics** |
|---|---|---|---|
| X1 → Y1→ Y2 | 0.107 | 0.051 | 2.114 |
| X2 → Y1 → Y2 | 0.099 | 0.040 | 2.463 |
| X3 → Y1 → Y2 | 0.097 | 0.038 | 2.564 |
| X4 → Y1 → Y2 | 0.094 | 0.041 | 2.293 |

Based on the test results, variable Y1, namely green techno humanistic educational ability, is a variable that has a significant influence as a mediator between all exogenous variables on readiness to accept solar PV investment because it has a test statistical value of > 1,645. This means that green techno humanistic educational capabilities are an important variable to pay attention to increase readiness to accept solar PV investment.

## CONCLUSIONS AND RECOMMENDATIONS

From the results of the analysis and discussion regarding the ability of green techno humanistic education to increase readiness to accept solar PV investment, the conclusions are as follows: The higher the social acceptance, the higher the influence on the ability of Green Techno Humanistic Education. T-test results with a value of 3.972 confirm that social acceptance has a positive effect on the ability of humanistic green techno education. The higher the acceptance of technology, the higher the influence on the ability of Humanistic Green Techno Education. The T-test results with a value of 4.156 confirm that technology acceptance has a positive effect on the ability of green techno humanistic education. The higher the environmental awareness, the higher the influence on the ability of green Techno Humanistic education. T-test results with a value of 3.601 results confirm that environmental awareness has a positive effect on the ability of green techno humanistic education. The higher the economic value, the higher the influence on the ability of Green Techno Humanistic Education. T-test results with a value of 1.928 confirm that economic value has a positive effect on the ability of green techno humanistic education. The higher the economic value, the higher the influence on solar PV investment readiness. T-test results with a value of 3.609 confirm that economic value has a positive effect on investment readiness in solar PV. The higher the environmental awareness, the higher the influence on solar PV investment readiness. T-test results with a value of 2.174 confirm that environmental concern has a positive effect on solar PV investment readiness. The higher the influence of Green Techno Humanistic Education capabilities, the higher the influence on solar PV investment readiness. T-test results with a value of 3.333 confirm that the influence of Green Techno Humanistic Education capabilities has a positive effect on solar PV investment readiness.

## FURTHER STUDY

Every research is subject to limitations; thus, you can explain them here and briefly provide suggestions to further investigations.

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