SPEKTRUM INDUSTRI
Vol. 19, No. 1, April 2021

e-ISSN : 2442-2630
p-ISSN : 1963-6590

SPEKTRUM INDUSTRI

Journal homepage :
http://journal.uad.ac.id/index.php/Spektrum

CONCEPTUAL MODEL DEVELOPMENT OF REGIONAL INNOVATION DRIVING FACTORS IN CIANJUR REGENCY

Anita Ilmaniati, Isma Masrofah*
Department of Industrial Engineering, Suryakancana University
Jl. Pasir Gede Raya, Cianjur, Jawa Barat, 43216, Indonesia

ARTICLE INFO

Article history :
Received : October 2020
Accepted : April 2021

Keywords:
Innovation
Attitude towards innovation
Knowledge awareness
Enthusiasm to innovate

ABSTRACT

Strengthening regional competitiveness as a derivative of strengthening national competitiveness encourages every region in Indonesia to design a regional innovation system (SIDa), including Cianjur Regency. One of the activity programs at SIDa that have been carried out in 2019 is an innovation competition. Based on the evaluation of the innovation competition activities, it is known that the level of community participation is still very low. This indicates that the level of innovation enthusiasm is still low in the Cianjur community. This study aims to formulate a conceptual model between the factors of attitude towards innovation and knowledge awareness of the innovation enthusiasm of the people of Cianjur Regency. The research was carried out by conducting a literature review based on related previous studies. In this study, operationalization variables and item indicators were also carried out, as well as testing the reliability and validity of the measurement scale using initial data. The results of this study are in the form of a conceptual model that links attitudes towards innovation and awareness of knowledge towards innovation enthusiasm along with the level of reliability and validity of the measurements.

INTRODUCTION

The implementation of the regional autonomy policy in Indonesia makes the role of regional governments very important in encouraging the strengthening of regional competitiveness which is a pillar of national competitiveness. National competitiveness in an emphasis on economic competitiveness is no longer determined based on ownership of resources, but on the ability of knowledge and technology to process these resources innovatively to increase economic added value as much as possible (Kemristekdikti, 2020). Based on the link between competitiveness and innovation, the Indonesian government is currently starting to promote "Sistem Inovasi Nasional" that has been derived from "Sistem Inovasi Daerah" (SIDa). SIDa is an entire process in one system to foster innovations between government institutions, local governments, agitation

* Corresponding author
E-mail address: isma.masrofah@unsur.ac.id
https://doi.org/10.12928/si.v19i1.18352

e-ISSN : 2442-2630
p-ISSN : 1963-6590

institutions, educational institutions, innovation support institutions, the business world, and local communities (BAPPEDA Kab. Cianjur, 2016).

The large area (361,434.98 ha based on BPS Kab. Cianjur 2018) and part of the scattered community make improving the quality of human resources (HR) in Cianjur Regency a challenge that still has to be faced. This is illustrated by the human development index (HDI) of Cianjur Regency in 2018 which is worth 63.7 (BPS for West Java Province, 2018), the lowest among other cities / districts in West Java Province. HDI shows the quality of society based on the dimensions of health, knowledge, and a decent life. The dimension of knowledge in HDI is closely related to the innovation process, resulting in increased innovation of Cianjur Regency is also still a challenge. Based on the 2016 SIDa Cianjur roadmap, the regional innovation program that has been implemented is the 2019 Regional Innovation Competition (the first time in Cianjur Regency). The participation of the public and the state civil apparatus (ASN) in the competition is based on the information from BAPPEDA Kab. Cianjur is still very low (<0.001% of the Cianjur population). The low enthusiasm for regional innovation competitions shows the need for an analysis of socio-cultural factors starting from attitudes towards innovation and awareness of knowledge from the people of Cianjur Regency. Previous research (Lebedeva et al., 2013) suggested that the innovation process must involve the social and cultural conditions of innovation because it includes certain interactions between elements of innovation.

According to the Joint Regulation of the State Minister for Research and Technology of the Republic of Indonesia and the Minister of Home Affairs of the Republic of Indonesia Number: 03 of 2012 and Number: 36 of 2012 concerning Strengthening the Regional Innovation System, the definition of innovation is the activities of research, development, application, assessment, engineering, and operation that hereinafter referred to as kelitbangan which aims to develop the practical application of values and new scientific contexts or new ways to apply existing science and technology to products or production processes (BAPPEDA Kab. Cianjur, 2016).

Based on Tidd, et al. (2005) the process of change in innovation has dimensions based on the level of novelty and based on the level of innovation. Based on the level of novelty, change from innovation can be categorized as incremental or radical, while based on the level of innovation, it can be divided into component level innovation to system level innovation.

Drucker & Marciariello (2008) suggest that there are seven sources of innovation opportunities, namely:

1. Unexpected successes and failures either from yourself / the organization itself or from others / competitors
2. Non-conformities, especially non-conformities in process
3. Process requirements
4. There are changes in the industry and market structure
5. There is a change in demographics
6. There is a change in meaning and perception.
7. There is new knowledge

The seven sources of innovation opportunities indicate that innovation is driven by individual/organizational perceptions of experiences and perceived changes, and is driven by the emergence of new knowledge. The source of innovation opportunities can be felt and utilized if individuals/organizations have attitudes and awareness of changes and new knowledge. The decision process in innovating is a process in which an individual (or other decision-making unit) moves from first knowledge about an innovation to forming attitudes towards innovation, then to the decision to adopt or reject, then the decision to implement a new idea, and confirm the decision (Rogers, 2003).

1. The Socio-Cultural Model of Innovation

Ettlie (2006) argues that the socio-technical system (STS), namely the harmonization between human and technical aspects (technology, procedures, etc.) can drive the innovation process. The human aspect of STS is the cognitive aspect and the social aspect of the individual. The social system is defined as a set of interrelated units that engage in common problems to

e-ISSN : 2442-2630
p-ISSN : 1963-6590

achieve common goals, and is the boundary over which an innovation spreads (Rogers, 2003). Innovation decisions will have an impact on the social system as a disaster in innovating which will bring about changes, both unwanted and unwanted changes (Rogers, 2003).

According to Rogers (2003), there are three types of innovation decisions: (1) optional innovative decisions, choices to reject or reject innovations made by individuals independent of the decisions of other members in the system, (2) collective innovation decisions, choices to provide or reject innovation. made by consensus among system members, and (3) innovation decision authority, the choice to reject or reject innovations made by relatively few individuals in the system who have power, status, or technical expertise.

Research by Lebedeva, et al., (2013) suggests an innovation model that is determined by socio-cultural factors such as individual values and social capital which will determine the attitude to innovation (attitude to innovation). This study uses openness to change; self-transcendence (self-transcendence); conservation values (conservation value); and self-enhancement to measure individual values, while social capital is measured by trust items; patience; and perceived social capital. The attitude to innovation factor is measured using the creativity item; taking risks for success; future orientation; and the innovation index. The model from the research of Lebedeva, et al., (2013) can be seen in Figure 2.

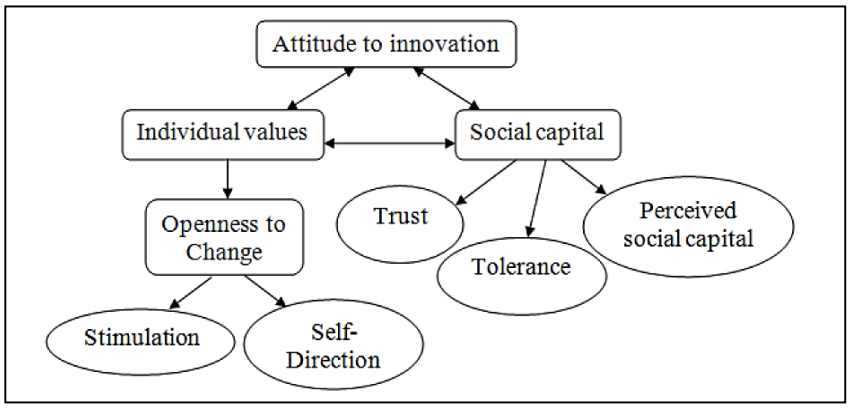

Figure 2. Research Model Lebedeva, dkk., (2013)

Goldsmith (1991) in Goldsmith & Foxall (2003) summarizes the innovation index measurement scale using a global innovation measurement scale based on previous studies (Open Processing Scale by Leavit & Walton in 1975; Jackson Personality Inventory by Jackson in 1976; Kirton Adaption-Innovation Inventory by Goldsmith in 1986 and by Kirton in 1976, and the Innovativeness Scale by Hurt et al. in 1977). The scale of measuring the innovation index uses several indicators, namely creativity, willingness to try new things, opinion leaders, and ambiguity and problems.

2. The Five Stages Model in the Innovation-Decision Process

The Five Stages in the Innovation-Decision Process Model proposed by Rogers (2003) describes that the innovation-decision process consists of five stages, namely (1) knowledge, (2) persuasion, (3) decision, (4) implementation, and (5) confirmation. Rogers (2003) describes the innovation-decision process as an information seeking and information processing activity, in which an individual is motivated to reduce uncertainty about the advantages and disadvantages of an innovation. The model proposed by Rogers (2003) can be seen in Figure 3.

The innovation-decision process begins with the knowledge stage. In this step, a person learns about the existence of innovation and seeks information about innovation. The knowledge awareness factor is at this stage. Knowledge awareness is generally defined as an awareness of the use of knowledge (Ogata & Yano, 2000). Knowledge awareness represents knowledge about the existence of innovation, this type of knowledge can motivate individuals to learn more about innovation and, ultimately, to adopt it (Sahin, 2006).

e-ISSN : 2442-2630
p-ISSN : 1963-6590

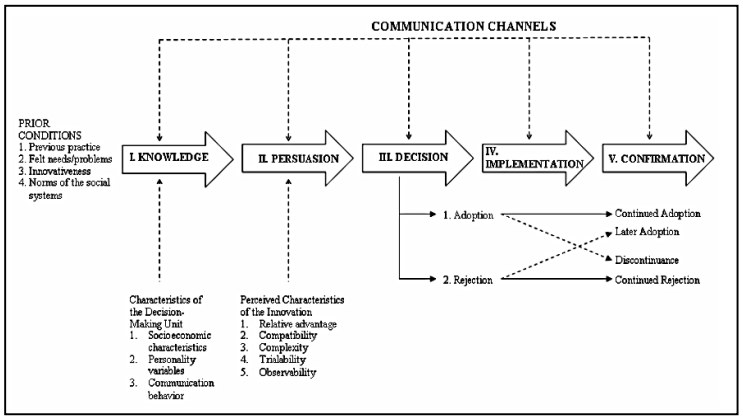

Figure 3. Model of Five Stages in the Innovation-Decision Process

Based on the research of Engelmann, et al. (2009) knowledge awareness can be defined as the activity of adding / seeking information (adding information) and extracting information. Ogata & Yano's research (2000) suggests that awareness of knowledge is related to curiosity (curiosity). Curiosity can be categorized as particular curiosity and extensive curiosity, particular curiosity is caused due to a sense of deficiency in certain knowledge, while extensive curiosity is caused by the desire to learn and increase knowledge (Ogata & Yano, 2000).

3. Roadmap for SIDa of Cianjur Regency

SIDa is an entire process in one system to foster innovations between government institutions, local governments, agitation institutions, educational institutions, innovation support institutions, the business world, and local communities (BAPPEDA Kab. Cianjur, 2016). Based on the SIDa roadmap for Cianjur Regency in 2016, it was formulated that there are five strategies to strengthen the regional innovation system that will be carried out by theCianjur Regency government. These strategies are:

a. Strengthening Regional Innovation System Policy
b. Development of industrial clusters
c. Development of an innovation network
d. Technopreneur development
e. Development of SIDa policy pillars

The strategy for strengthening the regional innovation system policy is derived into the Cianjur innovation program which consists of several activities, namely: (1) Cianjur Community Innovation Award; (2) Participation in West Java Innovation; (3) Innovation competition; (4) Activation of Leading Function; (5) Writing regional innovation books; and (6) Synchronization of innovation in the RPJMD - RKPD (BAPPEDA Kab. Cianjur). Activities (1), (2) and (3) are activities that specifically become the background of this research because these activities depend heavily on direct participation and enthusiasm of the Cianjur community for innovative activities.

The innovation network development strategy is derived into a program of understanding and innovation commitment which consists of: (1) Socialization of the SIDa Concept; (2) Seminars, workshops, workshops, innovation training; (3) innovation exhibition; and (4) Signing of MOU between SIDa institutions / organizations. This research can be a reference for activities (1), (2), and (3) because the results of this study can be a reference for designing the concept of these activities.

In general, the innovation process is the creation of a new product-market-technology-organization combination (PMTO combination) (Boer & During 2001). Emphasis on innovation which is a process of making innovation activities requires the formation of mental attitudes of personnel (in terms of regional innovation, personnel are local governments, communities, institutions, etc.) to be able to produce an innovation. Boer & During (2001) states that in the

e-ISSN : 2442-2630
p-ISSN : 1963-6590

process-based innovation model, there are several activities, namely problem solving, organizational adaptation, and internal diffusion. Internal diffusion activities include awareness of knowledge and forming attitudes of personnel involved in the innovation process.

This study will examine a conceptual model that connects the attitude towards innovation (attitude towards innovation) and the knowledge awareness factor (knowledge awareness) towards the enthusiasm for innovation in the people of Cianjur Regency. This is motivated by the low enthusiasm of the people of Cianjur Regency in participating in the 2019 Regional Innovation Competition where in the future the competition will become a routine program based on the recommendations in the SIDa roadmap of Cianjur Regency.

Based on the above background, this research aims to:

1. Develop a conceptual model between attitudes towards innovation (attitude towards innovation) and knowledge awareness factors (knowledge awareness of the enthusiasm for innovation in the people of Cianjur Regency
2. Develop a measurement model for a conceptual model between attitudes towards innovation (attitude towards innovation) and knowledge awareness factors (knowledge awareness of enthusiasm for innovation)

RESEARCH METHOD

A. Research Stages

This research was carried out according to the stages of scientific research, starting from the preliminary study stage which consisted of sub-stages of problem formulation and determining research objectives. The formulation of the problem was carried out by observing the phenomenon that occurred, namely the low enthusiasm of the people of Cianjur Regency in participating in the regional innovation competition organized by BAPPEDA Kab. Cianjur. This phenomenon is analyzed to obtain the formulation of the problem and research objectives.

The next stage of the research is the research model development stage, which consists of the literature study sub-stage, as well as the preparation of research hypotheses and the design of the research model. Hypothesis is compiled after obtaining references to innovation models. Figure 1. shows the stages of the research carried out.

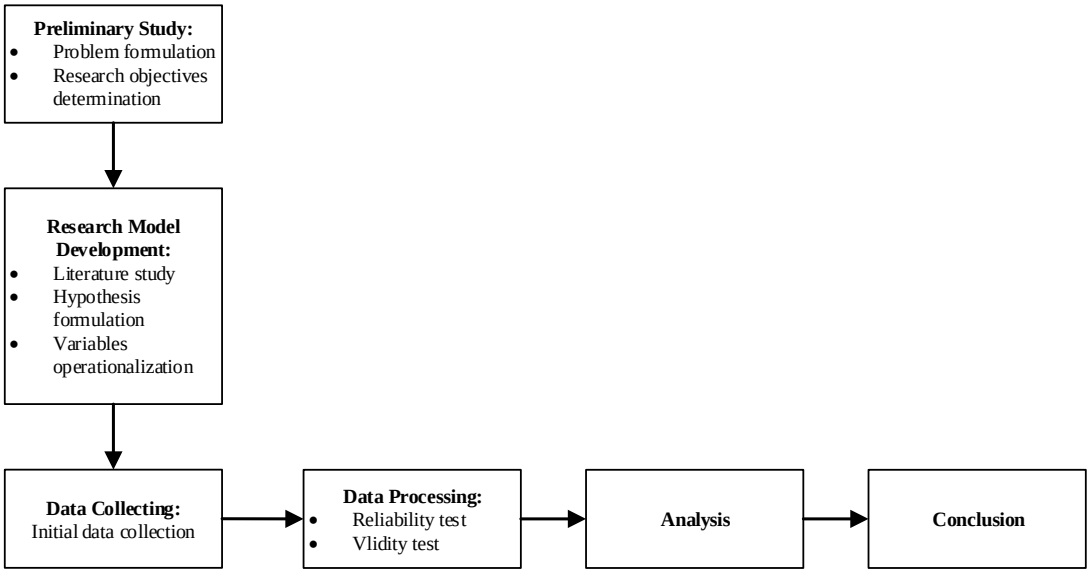

Figure 1. Research stages

e-ISSN : 2442-2630
p-ISSN : 1963-6590

B. Formulation of Hypothesis

In this study, the conceptual model was built based on previous studies.

1. Attitude to innovation (Attitude to innovation) - Enthusiasm to innovate

Lebedeva et al., (2013) stated that innovation can be divided into two, namely technological innovation and social innovation innovation. Social innovation is considered more related to community culture, so it depends on the characteristics and behavior of the innovators. Research by Lebedeva et al., (2013) assumes an attitude towards innovation as innovativeness. According to Hennessey & Amabile (2010), innovativeness is a reflection of the ability to apply creative ideas, while innovation is a successful implementation of creative ideas. Based on previous research, an attitude towards innovation or innovativeness can be called the ability to respond to emerging creative ideas.

Enthusiasm is a personal experience of feeling excited and inspired (Barsade & Gibson, 2007). According to Hakanen, et al. (2006) enthusiasm is a form of work engagement. Enthusiasm in innovation in this research can be interpreted as an attitude of community enthusiasm to intend to be involved in regional innovation programs organized by government elements. Individuals who are considered to have the ability to respond to their creative ideas are expected to intend more enthusiastically to participate in regional innovation improvement programs such as innovation competitions. Based on this, the first hypothesis is:

H1: Attitudes towards innovation have a significant and positive effect on enthusiasm for innovation.

2. Knowledge awareness - Enthusiasm to innovate

Dourish & Bellotti (1992) in Ogata & Yano (2000) define awareness as an understanding of other people's activities, which provides a context for one's own activities, while Ogata & Yano (2000) define knowledge awareness as awareness of the use of knowledge. Knowledge awareness in this study is defined as awareness of the innovation process and understanding that the innovation process can bring benefits. The awareness that innovation can bring benefits to life is assumed to increase the enthusiasm of individuals to participate in regional innovation improvement programs such as innovation competitions. Based on this, the second hypothesis is:

H2: Knowledge awareness have a significant and positive effect on enthusiasm for innovation.

Based on the formulated hypothesis, the conceptual model proposed in this study is as illustrated in Figure 4.

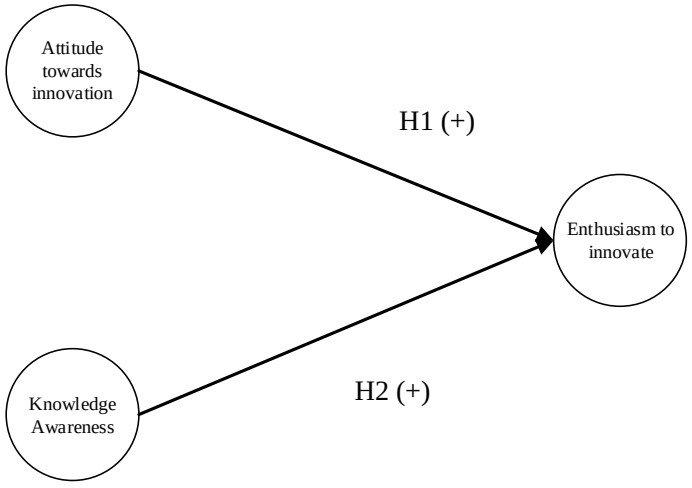

Figure 4. Conceptual model of regional innovation driving factor

e-ISSN : 2442-2630
p-ISSN : 1963-6590

C. Operationalization of Variables

The conceptual model of the driving factors for regional innovation in this study uses the relationship between latent variables that cannot be measured directly. Therefore, the variables in the study were operationalized to become indicator items. Attitude variables towards innovation are divided into four dimensions, namely creativity, risk taking for success, future orientation, and the desire to try new things. These dimensions are used based on previous studies (Lebedeva & Tatarko, 2013 and Goldsmith, 1991 in Goldsmith & Foxall, 2003). The operationalization of variables research can be seen in Table 3.

The results of the operationalization of the variables in Table 1 will be used as a measurement model that is tested for the reliability and validity of the indicators. The test of reliability and validity of the measurement model was carried out by looking at the Cronbach alpha value and the bivariate correlation obtained using the SPSS software.

RESULTS AND DISCUSSION

The results of the reliability test and validity test are listed in Table 1 and Table 2 respectively. The reliability and validity test of the measurement model in this study was carried out using only 30 samples of initial data, respondents are Cianjur residents.

The reliability test by looking at the Cronbach alpha value shows that all indicators on each latent variable can be relied on (reliable) to measure the latent variable. The Cronbach alpha value of each latent variable is > 0.7, with the highest value of 0.955 for the KH variable (desire to try new things), while the lowest value is 0.841 (future orientation).

Table 1. Reliability Test Result

No.	Variable	Code	Cronbach's Alpha	Explanation
1	Creativity	KR	0,916	Reliable
2	Taking risks for success	RS	0,887	Reliable
3	Future orientations	OM	0,841	Reliable
4	Desire to try new things	KH	0,955	Reliable
5	Knowledge Awareness	KP	0,936	Reliable
6	Enthusiasm to innovate	AI	0,887	Reliable

Based on the bivariate correlation test between indicators on latent variables, it is known that all indicators are valid for measuring latent variables. All bivariate correlations are significant at the 0.01 level or the 99% confidence level.

The two tests that have been carried out show that the measurement model proposed in this study can be used to test the conceptual model. The conceptual model testing (confirmatory analysis) was not carried out in this study because the scope of the research in this article was limited to the formulation of a conceptual model and testing the measurement model only.

The results of the conceptual model development in this study can be used as a basis for analyzing the relationship path between the variables contained in the model. In addition, this conceptual model can also be developed into a conceptual model that explains the driving factors of innovation by using other variables so as to better explain enthusiasm for innovation.

e-ISSN : 2442-2630
p-ISSN : 1963-6590

Table 2. Validity test result

No.	Indicator	Laten Variable	Indicator's bivariate correlation coefficient with variabel laten	Signification	Explanation
1	KR1	KR	0,730	Significant at 0.01	Valid
2	KR2		0,892	Significant at 0.01	Valid
3	KR3		0,803	Significant at 0.01	Valid
4	KR4		0,805	Significant at 0.01	Valid
5	KR5		0,862	Significant at 0.01	Valid
6	RS1	RS	0,688	Significant at 0.01	Valid
7	RS2		0,741	Significant at 0.01	Valid
8	RS3		0,656	Significant at 0.01	Valid
9	RS4		0,804	Significant at 0.01	Valid
10	RS5		0,786	Significant at 0.01	Valid
11	OM1	OM	0,893	Significant at 0.01	Valid
12	OM2		0,883	Significant at 0.01	Valid
13	OM3		0,937	Significant at 0.01	Valid
14	OM4		0,789	Significant at 0.01	Valid
15	KH1	KH	0,921	Significant at 0.01	Valid
16	KH2		0,808	Significant at 0.01	Valid
17	KH3		0,946	Significant at 0.01	Valid
18	KH4		0,898	Significant at 0.01	Valid
19	KH5		0,940	Significant at 0.01	Valid
20	KP1	KP	0,886	Significant at 0.01	Valid
21	KP2		0,771	Significant at 0.01	Valid
22	KP3		0,800	Significant at 0.01	Valid
23	KP4		0,825	Significant at 0.01	Valid
24	KP5		0,730	Significant at 0.01	Valid
25	KP6		0,790	Significant at 0.01	Valid
26	KP7		0,807	Significant at 0.01	Valid
27	KP8		0,858	Significant at 0.01	Valid
28	AI1	AI	0,728	Significant at 0.01	Valid
29	AI2		0,757	Significant at 0.01	Valid
30	AI3		0,908	Significant at 0.01	Valid
31	AI4		0,919	Significant at 0.01	Valid

e-ISSN : 2442-2630
p-ISSN : 1963-6590

Table 3. Variables research operationalization

Variable	Definition	Dimension	Indicator items	References
Attitude towards innovation	Ability to respond the emerging ideas	a. Creativity (KR)	1. I like to do things my own way, in an original way 2. It is important for me to always come up with new ideas and involve creativity 3. I am a creative person, always trying to create, produce something new 4. For me, diversity in life is important 5. My strong character is 'curiosity'	Lebedeva & Tatarko (2009)
		b. Taking risks for success (RS)	1. I feel quite comfortable in an unstable environment (change often) 2. I am critical to the rules of authority and can be independent 3. I am not afraid to make mistakes when I try something and improve it gradually 4. I am not afraid to face new unfamiliar things 5. I am ready to take risks to excel in my field	Lebedeva & Tatarko (2009)
		c. Future orientation (OM)	1. From my point of view, present losses are not necessarily bad for the future 2. I believe that change is the path to success 3. I believe that opportunities only come to those who are actively seeking them 4. I encourage creativity to others	Lebedeva & Tatarko (2009)
		d. Desire to try new things (KH)	1. I frequently improvise methods for solving problems 2. I feel challenged by questions that have not been answered 3. I look for new ways of doing things 4. I feel challenged by an unsolved problem 5. I enjoy the process of trying out new ideas	Goldsmith (1991) at Goldsmith & Foxall (2003)
Knowledge Awareness (KP)	Awareness of the innovation process and understanding that the innovation process can bring benefits		1. I am familiar with the term 'innovation' 2. I quite understand the meaning of 'innovation' 3. I get information about innovations from my surroundings 4. I collect information about ways to innovate	Nithin, et al. (2014) & Thacker, et al. (2008)

e-ISSN : 2442-2630
p-ISSN : 1963-6590

		5. I know about ways to innovate from my surroundings 6. I realize that innovation needs to be carried out continuously to develop my field of work 7. Innovation is the creation of new product-market-technology-organization combinations 8. I know examples of people / parties who innovate and then succeed in their fields	
Enthusiasm to innovate (AI)	Community enthusiasm attitude in intending to be involved in regional innovation programs organized by government	1. I will continue to develop my business / work field by continuing to innovate 2. I am interested in innovation-related activities organized by the Cianjur Regional Government 3. I will find out information about innovation-related activities held by the Cianjur Regional Government 4. I intend to participate in innovation-related activities organized by the Cianjur Regional Government	Develop by researchers

CONCLUSIONS

Based on the research results, it can be concluded that the factors of attitude towards innovation and awareness of knowledge related to innovation can be the factors that encourage people's enthusiasm for innovation. However, the significance of these factors for enthusiasm for innovation has not been tested. The measurement model for the proposed model is proven reliable and valid for measuring each of the latent variables contained in the conceptual model. A larger number of samples is needed to confirm the reliability and validity of the measurement model.

ACKNOWLEDGMENTS

The authors would like to thank the Ministry, Research and Technology/National Research and Innovation Agency of the Republic of Indonesia and Suryakancana University for providing facilities and financial support under Research Grant # 11 /LPPM/REK/UNSUR/ IV/2020.

REFERENCES

BAPPEDA Kab. Cianjur. (2016). Roadmap Penguatan Sistem Inovasi Daerah (SIDa) Kabupaten Cianjur. BAPPEDA Kab. Cianjur. Cianjur

Barsade, Sigal G, Donald E Gibson. (2007). Why Does Affect Matter in Organizations?. Academy of Management Perspectives, February

Boer, H, W.E. During. (2001). Innovation, what innovation? A comparison between product, process and organizational innovation. Int. J. Technology Management, Vol. 22, Nos. 1/2/3, 2001

Drucker, P, J.A. Marciariello. (2008). Management (Revised Edition). Harper-Collins e-books

Engelmann, T., J. Dehler, D. Bodemer, J. Buder. (2009). Knowledge awareness in CSCL: A psychological perspective. Computers in Human Behavior 25 (2009) 949–960

e-ISSN : 2442-2630
p-ISSN : 1963-6590

Ettlie, J.E. (2006). Managing Innovation: New Technology, New Product and New Services in A Global Economy (Edisi ke-2). Elsevier Butterworth-Heinemann, USA

Goldsmith,, R. E, G. R. Foxall. (2003). The Measurement of Innovativeness. The International Handbook on Innovation Edited by Larisa V. Shavinina. Elsevier Ltd.

Hakanen, Jari J. , Arnold B. Bakker, Wilmar B. Schaufeli. (2006). Burnout and work engagement among teachers. Journal of School Psychology 43 (2006) 495–513

Hennessey, Beth A, Teresa M. Amabile. (2010). Creativity. Annu. Rev. Psychol. 2010. 61:569–98

Kemristekdikti.(2020). Sistem Inovasi Nasional untuk Mendukung Kemandirian dan Daya Saing. Direktorat Jenderal Penguatan Inovasi. Makassar

Lebedeva, N., E. Osipova, L. Cherkasova. (2013). Values and social capital as predictors of attitudes towards innovation. International Laboratory for Socio-Cultural Research, WP5/09 SEARCH Working Paper of Seventh Framework Programme (FP7/2010-2.2-1)

Lebedeva, N.M., Tatarko A.N. (2009). Research Methodology of Personality to Innovation. Almanac of modern science and education, No. 4 (23) 2009, part 2, ISSN 1993-5552

Nithin, M.G., John J., Senthilkumar E., Nagappan N. (2014). Knowledge Awareness and Attitude about Research Ethics among Dental Faculties in India. J Contemp Dent Pract 2014;15(5):608-613

Ogata, H, Y. Yano.(2000). Combining Knowledge Awareness and Information Filtering in an Openended Collaborative Learning Environment. International Journal of Artificial Intelligence in Education (IJAIED), 2000, 11, pp.33-46

Rogers, E.M. (2003). Diffusion of innovations (Edisi ke-5.). New York: Free Press.

Sahin, I. (2006). Detailed review of Rogers' diffusion of innovations theory and educational technology-related studies based on Rogers' theory. The Turkish Online Journal of Educational Technology – TOJET April 2006 ISSN: 1303-6521 volume 5 Issue 2 Article 3

Thacker, A. K., A. M. Verma, Ram Ji, P. Thacker, P. Mishra. (2008). Knowledge awareness and attitude about epilepsy among schoolteachers in India. Seizure (2008) 17, 684—690

Tidd, B, Pavitt. (2005.) Managing Innovation: Integrating Technological, Market and Organizational Change (Edisi ke-3). John Wiley & Sons, Ltd, UK.