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Organizational Adaptibility Exploration as an Intervening Variabel on The Lingkage of Trandiciplinarity and Computational Skills toward Competitiveness

Pudjo Sugito*, Tanto Gatot Sumarsono, Kamaluddin
Faculty of Economics & Business, University of Merdeka Malang
Terusan Dieng No. 62-64; Malang; 65115.
*pudjo.sugito@unmer.ac.id

Abstract

This reasearch intends to explore the role of organizational adaptibility as an intervening variabel on the effect of transdiciplinarity and computational skills toward competitiveness. The research population is small industries at the district of Malang. The number sample are 70 small scale industries. Further, this research consists of 4 constructs, 14 indicators and 3 hypothesis. All primary data are analyzed by structural equation model with help of AMOS program. Based on the data analysis found that transdiciplinarity and computational skills significantly indirect effect to the competitive advantage through organizational adaptability. Event, organizational adaptability significantly effect to the competitive advantage. That is due to the critical ratio value of hypotesis 1 till hypotesis 3 higher than 2.00 and also the probability value is less than 0.05. It means that all research hypoteses are accepted. Therefore, it can be concluded that organizational adaptability mediate the effect of transdiciplinarity and computational skills to the competitiveness.

Keywords: Competitiveness, Computational Skills, Organizational Adaptability, Transdiciplinarity.

Abstrak

Penelitian ini bermaksud untuk mengeksplorasi peran adaptibilitas organisasi sebagai variabel intervensi pada pengaruh transdampisipasi dan keterampilan komputasi terhadap daya saing. Populasi penelitian adalah industri kecil di distrik Malang. Sampel nomor adalah 70 industri skala kecil. Selanjutnya, penelitian ini terdiri dari 4 konstruksi, 14 indikator dan 3 hipotesis. Semua data primer dianalisis dengan model persamaan struktural dengan bantuan program AMOS. Berdasarkan analisis data menemukan bahwa transdisiponchlinaritas dan keterampilan komputasi secara signifikan tidak langsung berpengaruh pada keunggulan kompetitif melalui kemampuan beradaptasi organisasi. Acara, kemampuan beradaptasi organisasi secara signifikan berpengaruh pada keunggulan kompetitif. Itu karena nilai rasio penting hipotesis 1 sampai hipotesis 3 lebih tinggi dari 2,00 dan juga nilai probabilitas kurang dari 0,05. Ini berarti bahwa semua hipotesis penelitian diterima. Oleh karena itu, dapat disimpulkan bahwa kemampuan beradaptasi organisasi memediasi pengaruh transdisiponampilan dan keterampilan komputasi untuk daya saing.

Kata kunci: *Adaptasi Organisasi, Daya Saing, Keterampilan Komputasi, Transdisiplinier.*

INTRODUCTION

The dynamics of the macro factors changing such as politic, economic, social, culture and technology create a lot of business opportunities. Unfortunately, it also has negative impact due to the creation of conditions which tend to be competitive. It certainly faced by all organizations, including business entities. The increasing of deregulation both nationally and globally are the concrete examples of how the changing continues, and tend to be fast. Consequently, to take advantage of the business opportunities have been more competitive. It is because more and more new competitors come and penetrate to the market. Consequently, the competitive advantage theory which popularized by Porter (1993) begin to be debated as the best strategy to win the market competition.

Base on the phenomenon, all businessmen have to improve their adjustment ability to the fasting changing era. Shortly, a very high quality competency is extremely required by all managers to be the winner in the recent era. These ideas are supported by several researches such as Hana (2013), Martin et al. (2013) and Nouruzy et al. (2013) stated that organizational adaptability is absolutely required for all business entities. Obviously, organizational adaptability must be built through organizational competencies up to date regularly. This phenomenon of course are as an indication of how the urgency of this research.

Porter and Kramer (2006) explained that there are linear relationship between competitive advantage and organizatioal adaptability. It means, organizational adapatibility strongly encourage the realization of corporate competitiveness. Additionally, Cleven et al. (2007) also stated that organizational adaptability is the key success for business entities to compete in the competitive global economy era. Of course, this is due to the dynamics of change, as the implications of the information technology develop rapidly. According to Day and Wensley (2008) clarify, it is required excelent economic resources and superiority position to create the competitive advantages. Excellence and institutional resources have a significant impact on the competitive advantage. Then, Reeves and Deimler (2013) in their research found, the adaptive advantage as a model of competitive advantage to address the changing era. Further, disclosed that one of the significant variables trigger adaptibilitas are competencies respond to opportunities change. Also, it is explained that adaptibilitas consists of soft and hard competency.

Colgate (2009) describes, the organization's competitive advantage as a unique position against competitors. The competitive advantage can be gained from most of resources including capital. Resource in question is the strength and weakness of marketing performance, while capital is defined as the ability of the company to manage the resources. In other words, the performance level of the organization will affect the level of the company competitive advantage. Competitive advantage can be created with the right knowledge and always in up to date regularly. Also, article of Bellhouse (2011) stated that adaptibility strongly relate to the competitive advantage.

In addition, Hsieh et al. (2012) stated that organizational competency have a significant influence to the competitive advantage. Organizational competency which meant covering the management skills ranging from top management, middle management through the ranks as a management supervisor who deal directly with the operational workers. Meanwhile, Goksoy et al. (2012) in their research about The New Competitive Advantage: Technological Change: An Application of Electronic Data Interchange Implementation in Automotive Industry revealed that the adoption of new technology into a strategic asset in building competitive advantage. In another part explained that it is considering the mastery of the latest technology will be able bedampak on management skills break down complex problems into relatively simple. Qiu (2009) in his research also found that the computational ability is an important asset which contributes to human resources adaptibilitas business entity. Segalas and Tejedor (2013) stated, transdiciplinarity as competencies that can build competitive advantage of business organizations.

Based on elaboration above, the aims of this research are (a) to analyze effect of transdiciplinarity toward competitive advantage through organizational adaptability (2) to analyze effect of computational skills toward the competitive advantage through organizational adaptability, (3) to analyze effect of organizational adaptability to the competitive advantage

LITERATURE REVIEW

The Competitiveness

According to Furrer (2008), the pursuit of competitiveness is arguably the central theme of the academic field of strategic management. Further, Porter (2006) stated, the competitive advantage as the heart of the corporation's performance in a the competitive market. Therefore, the importance of competitive advantage may not be ignored. The competitive advantage basically grow from the value or benefit that can be created company for the buyers more than the cost to be incurred by the company to create it. The value of these benefits are available or paid by the buyer, and superior value derived from the offer price lower than the price of competitors for equivalent benefits or offers unique benefits that exceed the price offered. Also, Mark (2009) argued, the competitive advantage should be viewed as a dynamic process rather than the end result. Also stated, as a process consisting of a source of excellence, excellence position, and the final results and achievements of investment income to sustain excellence. Shortly, a competitive advantage can be gained over competitors by offering customers greater value, either through lower prices or by providing additional benefits.

Organizational Adaptability

Reevers and Deimler (2013) define that the organizational adaptability relates to the ability of organization to improvise and adjust to the structure and process\business, in order to do business successfully in the dynamic changing environment. Recently, a very high competency should be owned by each manager in the buisness organization. Otherwise, the organization's performance will decline towards bankruptcy.

In the traditional approach, designing a strategy to compete always assume that everything is stable. Many business entities intend to build excellence conpetitiveness by applying economies of scale, utilizing niche market or by exploiting a certain skill and other economic resources. However, globalization, new technology, and higher transparency climate has been mutually integrate with each other and set up a business environment. Sustainable competitive advantage no longer appear on the positioning or resources. Reevers and Deimler (2013) explains derived from several organizational competencies that can spur adaptability, among others, (a) the ability membasa and react to the signal change, (b) the ability to conduct experiments on a regular and quick, (c) the ability to manage complex systems and interconnected. While, Roy (2012), Davies et al. (2013) and Okoro (2013) clarify that the fasting changing era requires much skills such as virtual collaboration, transdiciplinarity, computational skills and cross-cultural competencies. Those skills of course required to build organizational adapatability.

Transdiciplinarity

The term transdisciplinarity is widely used, but with no clear, unequivocal or generally accepted definition. However, according to Davies et al. (2013), transdiciplinarity is the ability to understand of multi disciplinary working. Throughout the 20th century, specialization to be excellent and transdiciplinarity approach begin to take the role in the next century. As seen in the emergence of new studies, such as nanotechnology which combines molecular biology, biochemistry, protein chemistry, and other specialties. This shift has major implications for the skills and knowledge of workers required in the organization. A prominent astrologer and author of transdisciplinary bring together researchers from different disciplines to work in multidisciplinary teams. Interestingly, transdisciplinary orientations in research, education and institutions try to overcome the mismatch between knowledge production in academia, and knowledge requests for solving societal problems. Briefly, transdiciplinarity absolutely required by all organizations to face the future.

Computational Skill

Okoro (2013) defines that computational skills is the ability to translate large amounts of data into abstract and understand the data-based reasoning. As we know that the number of data always increase exponentially. Consequently, organization need computational thinking skills to understand and to interpret information. Programming languages and technologies that teach beginners the basics of programming and physical cyberspace will allow to manipulate the environment and improve the interactive capabilities. The use of simulation will be a core expertise when it began to show regularly in the discourse and decision-making. Human resource departments are currently appreciate to the applicants who are familiar with basic applications, such as microsoft office and the guantitative resoning skills. In addition, to develop computational thinking skills, workers should be reliaze of its limitations. It requires an understanding that the model is only good as the data give their input - even the best model is an approximation to reality and not reality itself. Also, workers should still be

able to act in the absence of data and not be paralyzed when it lacks algorithms for each system to guide decision-making.

Therefore, based on literature review and several previous research, the hypotheses formulation in this study are (1) Transdiciplinarity significantly indirectly effect to the competitive advantage through organizational adaptability (2) Computational skills significantly indirectly effect to the competitive advantage through organizational adaptability, (3) Organizational adaptability effect significantly to the competitive advantage

METHOD

This research is categorized as explanatory research by quantitative method. In this research, transdiciplinarity and computational skills are exogenous variables, the endogen variable is competitive advantage and organizational adaptibility as a intervening variable.

Based on literature review, the operational definition of research variables are as follows: (a) transdiciplinarity is an ability to understand the concepts that cut across various academic disciplines/work, (b) computational skills is an ability to translate the data into an abstraction and understand the arguments based on the data, (c) organizational adaptability is the ability of an organization to improvise and to adapt to the structure and process\business then successfully achieve its objectives in a dynamic and changing environment (d) competitiveness is level position unique organization against its competitors and obtained most of the resources and capital employed. The indicators of the research variablea are as follows.

Table 1. Indicators of Research Variables

Variables	Notation	Indicators
Transdiciplinarity	X1	Interdisciplinary Ability
(Davies et al., 2013)	X2	Complex thinking ability
	X3	Generalist ability
Computational Skills	X4	Ability to translate of data
(Okoro 2013)	X5	Data based reasoning ability
	X6	Logical thinking ability
Organizational Adaptability	X7	Responding Skills to change
(Reeves & Deimler, 2013)	X8	Ability to do experiment
	X9	Ability to manage complex systems
	X10	Skills to motivate labor
The Competitiveness	X11	Diferentiation
(Porter, 2006)	X12	Capability Gap
	X13	Immitativeness
	X14	Excellence position

The research population are small industries at the district of Malang, Indonesia. Due to the relatively large number of respondents and to anticipate the defect data, it is used proportional random sampling techniques. It means, respondents are selected based on certain considerations in order to obtain samples with specific characteristics. According Cuttance (2009), representative respondents in Structural Equqtion Model

(SEM) analysis techniques are 70 respondents. Therefore, the number of respondents of this study determined the 70 respondents who are performing well, as a condition of SEM analysis. Further, data were collected by questionnaires. The questions contained in the questionnaire was made in the form of questions using a Likert scale of 1-5, from strongly disagree to strongly agree. Of course, research has proven the validity of the instrument and reliability.

The primary data will be analyzed by Structual Equation Model (SEM) as the opinion of Randall et al. (2004) and Cuttance (2009). There are two types of techniques analysis, (a) Factor Analysis at SEM, applied to confirm the most dominant factor in the group of variable and (b) Regression Weight at SEM, applied to confirm the examine how much the relationship among variables. Furthermore, complete SEM modeling necessary steps (a) the model development (b) create a path diagram, (c) selecting an input matrix and estimation of the model, (d) evaluation criteria of goodness-of-fit (e) the interpretation of the model and (f) model modification.

RESULT AND DISCUSSION

The number of small industries in the district of Malang are 289,103 units (Malang Department of Cooperatives and Trade, 2015). From a sample of 70 respondents of small industry owners, in fact 64% men and 36% women. Based on the data processing, the following figure demonstrated the grand mean of respondents opinion as follows.

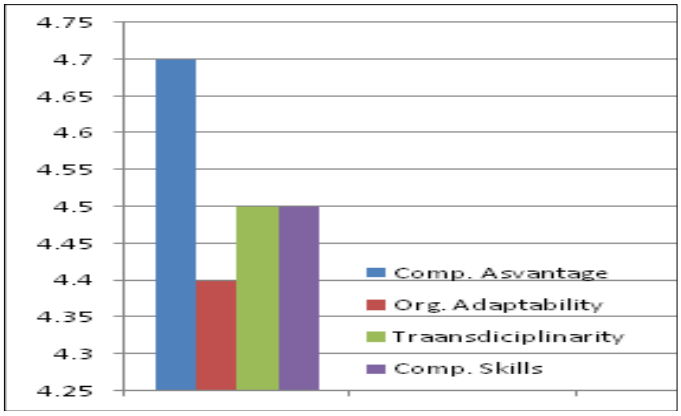

Figure 1. Grand Mean Respondent Perception

As seen at figure 1, the grand mean score of the competitiveness is 4.7. It means, respondents are strongly agree to the necessary of competitive advantage. In other word, small industries should have an enough competitiveness to peneterate and to win the market competition. Furthermore, the organizational adaptability score is 4.4, similar to the score of transdiciplinarity. It can be interpreted that all small industries also need those skills. Meanwhile, the score of computational skills of 4.4. Even, the score of computational skills less then other variable, the respondens is still assume that computational skills still required to increase the competitiveness of their industries. So, based on the descriptive analysis, respondents stated that competitive advantage, organizational adaptability, transdisiplinaritas and computational skills is actually very important to do business.

Subsequently, the goodness of fit index will be presented to know the fitness of structural equation modeling (SEM), as shown at Table 2. As shown at table 2, the model fit to the data used in this research. This is due to the probability value is 0.104 more than probability requirement of 0.05. The significance level of Chi-Square Model is 56.107, RMSEA, GFI, index CMIN /df, TLI, and CFI are within the range of expected values. Except RMSEA is marginal. Then, results of Confirmatory Factor Analysis for exogenous constructs used to test unidimensionalitas dimensions that form latent variables above indicates that the value of the results of the model in accordance with the criteria of Goodness of Fit, so that the model can be accepted.

Table 2. Goodness of Fit Index

Goodness of Fit Index	Cut-off Value	Result of Analysis	Evaluation
X^2 - Chi-square	P=5%, Chi-Square 68.6732	40.937	Good
Significance Probability	≥ 0.05	0.104	Good
RMSEA	≤ 0.08	0.012	Marginal
GFI	≥ 0.90	0.980	Good
AGFI	≥ 0.90	0.953	Good
CMIN/DF	≤ 2.00	1.336	Good
TLI	≥ 0.95	0.970	Good
CFI	≥ 0.95	0.958	Good

Further, the results of structural equation full models (SEM) is illustrated at Figure 2. This figure demonstrate that there is a positive effect of exogenous variables (trandisiplinarity and computational capabilities) to the endogenous variables (competitiveness) through intervening variables organizational adaptability, which is shown at the positive coefficients on each of arrows that lead to competitiveness variables. Firstly, coefficient effect of trandiciplinarity to organizatioal adaptability is 0.45; secondly, coefficent effect of computational skills to organizational adaptability is 0.38 and thirdly, coefficient effect of organizational adaptability toward competitive advantage is 0.37. in other world all coefficients effect are all positive.

The level of significance for 0.104 indicate that the hypothesis that there is no difference between the sample covariance matrix and covariance matrix estimated from the population can not be rejected and therefore exogenous construct is acceptable. Then, the strength of the dimensions to form a latent factors can be analyzed using the t test for regression weights as presented in Table 2 and the view factor loading of each of the dimensions.

Critical ratio in the table is identical to the t-test in the regression analysis. The critical ratio greater than 2.00 indicates that all research variables are significantly above the dimensions of the latent factors are formed. Meanwhile, the terms of a variable which is the dimension of the latent variable is if it has a loading factor of more than 0:40. As seen at table 5 below that the critical ratio for each dimension already qualified namely > 2:00. Meanwhile factor loading of each dimension are already qualified namely > 0:40.

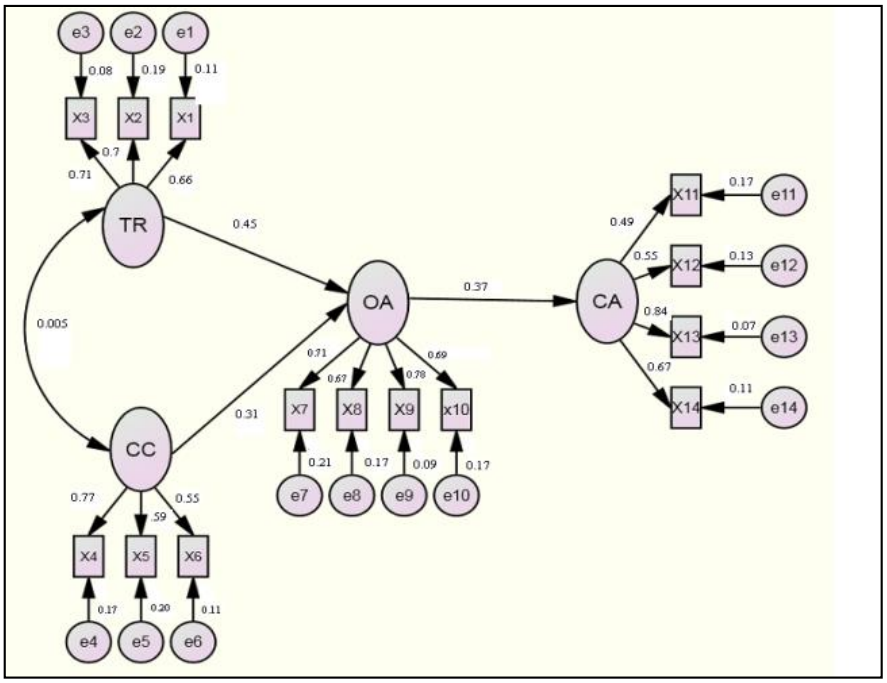

Figure 2. Path Diagram

Therefore, it can be concluded that those research variables significantly above the dimensions of latent variables were formed. Then, based on the results if the data path diagram in figure 1 SEM analysis also revealed that there is a positive effect of exogenous variables (transdisiplinaritas and ability komutasional) against endogenous variable (competitiveness) through a moderating variable of organizational adaptability in small industry in Malang, which indicated the coefficients which are respectively arrows that lead to the endogenous variables. Thus, based on table 4 is very clear that the testing of the model shows that the model is fit to the data used in the study as seen from the level of 0104 corresponding probability requirement (> 0.05). The level of significance of the Chi-Square for 40 937 models, RMSEA, GFI, index Cmin / df, TLI, and CFI are within the range of expected values.

This research intends to explore the adaptability of the organization as an intervening on the influence trandisiplinaritas and computational capabilities on the competitiveness. The indirect effect must be calculated manually, because the AMOS program has no output the least significant indirect effect.

Table 3. The Effect of Trandisiplinaritas and Computational Capabilities Through organizational Adaptability to The Competitive Advantage

Effect		Through Intervening Variable	Endogen Variable
		Organizational Adaptability	Competitiveness
Exogeneous Variables	Transdiciplinarity	0.000	0.166
	Computational Skills	0.000	0.115

As seen at Table 3, transdiciplinarity indirectly effect to the competitiveness through organizational adaptibility by coefficient of 0.166. Similarly, computational skills also effect indirectly to the competitive advantage through organizational adaptibility by coefficient of 0.115. It means, the organizational adaptibility mediate the effect of transdiciplinarity and computational skills to the competitiveness at small industries in Malang, Indonesia.

It should be noted that organizational adaptibility variable has four indicators namely, reacts to changes, experimenting skills, ability to manage complex systems and skills to motivate workers. The four indicators are exactly reflect to the organizational adaptibility. As seen at the path diagram at figure 3, the loading factors of organizational adaptibility are extremely vary. Two highest loading factors are indicator of X7 and X9, with each values loading factor are 0.71 and 0.79. Which means that the two indicators are the most influential indicator in organizational adaptibilitas variables. The t value of both indicators show so far those indicators have a considerable influence on the organization adaptibilitas as a moderating variable. It means, the higher of the value of both indicators, the higher the organizational adaptibility has.

The X7 (skills reacts to changes) that have the highest loading factor on entrepreneurship moderating variable means that a relatively small industry players respect to responsiveness to changes in the operations management. It was believed to be because of responsiveness to changes in business will always be made in accordance with the dynamics of change. In other words, businesses that have will be more resilient and always assume that kebehasilan in running a business is largely determined by its ability to ma \ emanfaatkan change. Perpetrators of such efforts are generally rich with new ideas and creative in doing business and will always be optimistic even in every effort made.

Furthermore, X9 (ability to manage a complex system) means that businesses respect to proficiency resolve complex issues and has always been a pioneer in running the business. This attitude is very beneficial, because it will always feel optimistic in the field of business management. An attitude which would be an important asset in running a business, whether small or large scale

Certainly, when both indicators are synergized, it will make the organization adaptability actually be moderating the influence transdisiplinaritas and computational capabilities on competitive advantage. Moreover, based on the results of SEM analysis, it turns out the influence transdisiplinaritas and computational capabilities on competitive advantage is relatively large. Meaning, organizational adaptability through two indicators X7 and X9 will contribute to the realization of competitive advantage of small industry for the better.

Hypothesis 1: trandisiplinarity has a significant indirect effect to the competitive advantage through organizational adaptability. This is seen from result of data processing seen that the CR for 2.275 are eligible ie> 2:00 and ap value of 0.000 qualified ie <0.05. Hypotesis 2: computational capabilities has a significant indirect effect to the competitive advantage through organizational adaptability. Hypotesis 3: organizational adaptability significantly effect to the competitiveness. Thus, all reserach

hypotesis can be accepted. It can be explained that organizational adaptability has been a mediator to the effect of trandiciplinarity and computational capabilities to the competitiveness.

The research findings strengthen the opinion of Segalas and Tajedor (2013), also the statement of Davies, Fidler & Gorbis (2013) which stated that transdisiplinaritas affect to the organizational adaptability. In addition, these findings reinforce the notion of Kajanova (2011), in his article about "The Competitive Advantage in the Global labor Market", that capability empirictly impact on competitiveness. Further, these finding support the research findings of Bellhouse (2011) in his article Adaptibility and The Competitive Advantage. Also, promote the idea of Reeves & Deimler (2013) in his article on "New Bases of Competitiva Advantage" that the organizational adaptability is a new foundation to build competitive advantage.

CONCLUSION

Based on the research analysis, it can be concluded that (1) the organizational adaptability as an intervening variable mediate the effect of trandiciplinarity and computational capabilities to the competitiveness. Then, (2) the value of cririal ratio and probability of the four research hypothesis (H1-H3) greater than 2.00 and P value less than 0.05. Thus, organizational adaptability is a variable that can moderate the creation of competitiveness. It was due to the development of organizational adaptability will be a positive influence on competitiveness. Meaning, the better adaptability organization owned by small industry, it will give optimism on the completion of the various problems encountered. In other words, the small industris will able to develop by increasing the role organizational adaptability on the effect of transdiciplinarity and computational skills to the competitiveess. Based on the conclusion, it is recommended that (1) Department of Industry and Trade at Malang, Indonesia should pay strong attention to this research results by creating a program of small industry development through capacity building of organizational adaptability. Also (2) the research findings can be used as the basis a new reference for further management research in order to get a sharper finding and can be generalized and apllied to all SMEls at all places as well.

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