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# Relationship Between Innovation Activities and Business Performance: A Case Study in Indonesia\*

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## Abstract

The study aims to investigate the relationship between innovation activities and business process performance in higher education institution (hereinafter referred to as “HEI”) context. The data was collected using a survey and later analyzed through Partial Least Squares Structural Equation Modelling (PLSSEM) and SmartPLS software. A total of 50 questionnaires were submitted from respondents representing vocational study program management located in Makassar, Indonesia. The findings show that two hypotheses discussed in this study fit the empirical data. Specifically, the results show that there is a positive relationship between innovation activities and business process performance, involving two types of innovation activities, which are exploration activities and exploitation activities, within HEIs. Explorative activity is firmly related to exploitative activity, which furthermore links to business process performance within the HEIs observed. The results confirm that exploration activity can stimulate and lead the HEIs management to generate exploitation activity. For instance, capabilities to absorb knowledge from the external institution may lead this institution to generate advanced academic processes, as well as more efficient and effective managerial processes. The study also signifies ambidexterity capacity, suggesting that it may lead HEIs management to formulate proper strategies in achieving better performance and gaining competitive advantage.

**Keywords:** Innovation Activities, Higher Education, Business Process Performance, Ambidexterity Capacity

**JEL Classification Code:** O30, I23, D23

## 1. Introduction

It is generally accepted that excellence of education, including in higher education institution (hereinafter referred to HEI), highly contributes directly to the social and economic development of a country. The awareness of education excellence is increasing time, especially in responding to the local and global human challenges that

have yet to be solved, such as, industrial revolution 4.0 and current Covid-19 pandemic. Ensuring the right direction of education development, HEI is required to respond to the phenomenon in a right way, that sets the institution to become innovative (Cai, 2017). Therefore, it needs enough understanding of the mechanism that underlies the process of strengthening academic innovativeness and the existence of a proper strategy to achieve the performance. It is becoming increasingly important that HEI management needs to regularly identify its distinctiveness from other institutions, which may lead them to find their competitive advantages.

The purpose of the research is to investigate the relationship between innovation activities and business process performance within higher education institution. Understanding innovation activities is an important endeavor in educational management, which is optimizing allocation of resources and achieving desired organizational objectives. Scholars in education management continuously suggested that HEI should develop an entrepreneurial organizational atmosphere to overcome the demands of the workplace and to support academic activity that can generate a positive impact on society (Brennan, 2010).

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The willingness of HEI management to respond to such phenomenon is a sign that it wants to perform functions to fulfill the expectation from its main stakeholders. From this point of view, business process management could be adopted to ensure that the organization stays competitive on the market and, at the same time, meets the customer requirement. It may also facilitate university management to develop a general framework for quality assurance system. For example, alumni feedback, which is a part of business process evaluation, can enrich management to update the teaching method or curriculum. Through this mechanism, HEI can continually improve its business process performance.

Even though there are many studies that discussed the importance of development of the innovation atmosphere within organization, especially in the profit-oriented organization, such studies have yet to receive enough attention in the literature, especially in Indonesian higher education context. Fortunately, as one of the emerging countries, the Indonesian government has already introduced an education management policy that obliges higher education management to build a culture of innovation within the organization (Sutrisno, 2019).

The study is aimed to identify the practical and relevant elements in HEI that positively correlate with the development innovation culture and also, further, lead improvement in HEI performance. Therefore, the findings of this study can be a practical reference for HEI in implementing the business process management and introducing the innovation culture within the organization. The study surveyed HEI management perception on innovation activities and academic business performance, focusing on study program level and in the vocational oriented HEI, such as polytechnic and colleges.

## 2. Literature Review

### 2.1. Business Process Performance

Business process management is identified as an integrated system, which consists of a broad range of techniques and tools leading to increasing its effectiveness and efficiency level (Z. Huang, Van Der Aalst, Lu, & Duan, 2011). Basically, it helps HEI management know how to approach the work effectively, design their particular job in an effective manner, and overcome bottlenecks that occur in the organization, with problem solving techniques.

The adoption of business process management in the education management has been widely reviewed (Drăgan, Ivana, & Arba, 2014). For example, the generic process in a study program involves updating of the curriculum, accreditation of management, program creation and development, and post-learning assistance. The implementation of the concept is conducted simply because

of the willingness of the management to provide better service to the stakeholders. It is a complex issue, especially when it relates to the institution's sustainability planning.

The business process concept simplifies the institution to mix with other management practices, like human resources development or total quality management. The combination of such management practices could be further evaluated through business process performance. This study highlights the transversal competencies as business process performance in HEI, which is commonly studied by other scholars (Drăgan et al., 2014). The competencies adopted in this study refer the teaching and learning process as one of the main domains of HEI in Indonesia.

### 2.2. Innovation Activities

Innovation is generally conceptualized as a newfound function, feature, and technology. Other scholars also connected the term with the newness products' specifications, and the way to assist customers to express their identity (Bloch, 2011). Moreover, Birkinshaw, Hamel, and Mol (2008) introduced innovation management as the discovery and implementation of a management function that is intended to achieve organizational goals. Also, the relevant literature showed that innovation contributes to organization performance (Hortinha, Lages, & Lages, 2011; Mukhtarova & Mylytkbayeva, 2014)).

Researchers classify innovation as two distinct sets of activities – exploration and exploitation. March (1991) introduced the concepts of exploration and exploitation with reference to the way an organization responds and adapts to its environment. He shows that an organization faces the choices of whether to explore new knowledge or to focus on existing one, whether to explore new knowledge that would bring new products into the market, without exploiting current products that build substantial profit, or vice versa. He also explained that both kinds of activities are the determinants of adaptive processes in organizations and the main elements of the improvement in organizational performance (March, 1991). Other scholars associated exploitation activities with incremental innovation and exploration activities with radical innovation (Atuahene-Gima, Slater, & Olson, 2005; Benner, 2001). Moreover, some literature discussed that both activities can be ambidextrous in organization (O'Reilly & Tushman, 2008).

Innovation activities in higher education can be conceptualized as an invention and a discovery effort in which academic programs are created and delivered (Blass & Hayward, 2014). The activities can be expanded into commercialized ideas, initiatives, and other institutions' services into the market or public (Bovkun & Troshina, 2017). Innovative activities can also be implemented in educational management.

Exploration and exploitation are generally linked as substituted activities and even become mutually exclusive. On the contrary, other studies propose an alternative approach: exploration and exploitation may complement each other (Gupta, Smith, & Shalley, 2006), which also means that certain organizational resources could support both activities (Bierly & Daly, 2007). The latest discussion theme of this issue is whether both activities fall in orthogonal or continuum conception. However, in the educational context, innovation activities can be delineated in the continuum conception.

### 2.2.1. Exploration Innovation Activities

Exploration relates to activities that search for newfound knowledge (Levinthal & March, 1993), capabilities, along with invention, experimentation, and risk taking (March, 1991). It can be viewed as a challenge to existing approaches. Outcomes of exploratory innovation activities are new, better products or services with significant utility and enable the organization to enter or even create new markets (He & Wong, 2014). It emerges from discovering new needs, emerging trends, or identifying gap in product or services. In the educational context, the life-cycle of program development is commonly initiated with concept exploration (Gustun & Budaragin, 2017). For example, updating methods and modes of delivery through dynamic interplay between industrial practices and higher education (Goddard, Robertson, & Vallance, 2012); enhancing the collaborative research in the institution and relevant industries (Huang & Brown, 2019).

The importance of exploration activities in HEI becomes the subject of much management education research. The mission of the institution continues to evolve in response to economic and social imperatives, therefore they are viewed as potential engines of the knowledge industry and development agent of generation and application of knowledge (Sheridan & Fallon, 2018; Vorley & Nelles, 2009). Considering this changing role, higher education is currently emphasizing exploration innovation activities, which involve absorption capabilities, inter-organizational relationship, and financial and market projection (Marín-Idárraga, Hurtado González, & Cabello Medina, 2016). Furthermore, interaction between HEIs and enterprises is strongly suggested for the purpose of enhancing its performance within wider social, economic, and cultural context (Organisation for Economic Co-operation and Development (OECD), 2017).

### 2.2.2. Exploitation Innovation Activities

Exploitation activities are related to efforts in advancing current knowledge that has already been implemented (Levinthal & March, 1993). It involves refinement efforts such as production, selection, implementation, execution and even controlling (March, 1991). The activities improve output, which

are closely related to the organization's current strategy (March, 1991). These activities mainly developed on upgrade of current capability and processes and may lead to incremental product changes, which mainly intended to penetrate existing markets (Amason, Shrader, & Tompson, 2006).

It requires extensive knowledge and capabilities at all levels as they are frequently implemented at lower hierarchical levels. Therefore, level of education, knowledge, and capabilities may lead to successful innovations. Many scholars studied antecedents of exploitation, that is related to capabilities which favor the operational improvement, the achievement of high efficiency rate and the obtaining of significant profits in the short term (He & Wong, 2014).

### 2.2.3. Mediating Role of Exploitation Activities

Connecting exploration innovation activities with exploitation activities has been widely discussed in the seminal work. Some innovation scholars explained both activities are in the innovation development stage, where exploration was put in the first stage, followed by exploitation activities (Pandey & Sharma, 2009). Exploration and exploitation activities are generated from distinct learning capabilities. Exploitation activities stem from capabilities to search, refine, select and reuse existing routines. On the other hand, exploration activities stem from absorption capabilities, inter-organizational relationship and market projection (Koryak, Lockett, Hayton, Nicolaou, & Mole, 2018; van Dat, 2020).

The most widely-used framework in connecting these two activities is ambidexterity and the fit combination of both activities. Managing ambidexterity requires constant readjustment tension between exploration and exploitation. Ambidexterity is defined as an organization's ability to manage current demands while being adaptable to changes in the environment (Birkinshaw & Gibson, 2004). Identification of the right combination would help organizations devise better strategies that hopefully affect performance (Koryak et al., 2018). It has long been recognized that firms should "engage in enough exploitation to ensure the organization's current viability and engage in enough exploration to ensure its future viability" (Levinthal & March, 1993), p. 105). Indeed, organizational ambidexterity is highly relevant with technological innovation, organizational learning, and organizational competitive advantage (Benner, 2001).

Based on the above explanation, the article proposes the following hypotheses:

**H1:** *There is a relationship between exploration innovation activities and exploitation innovation activities within HEIs.*

**H2:** *There is a relationship between exploitation innovation activities and business process performance within HEIs.*



**Figure 1:** The Relationship among Variables in this Study

Therefore, the conceptual model of the research can be explained as follows:

### 3. Methods

#### 3.1. Target Population

Management of vocational study programs in Makassar, Indonesia, was targeted to be the participants of the survey for this study. There are 154 vocational study programs operated in Makassar under the coordination of the Ministry of Education and Culture, Republic of Indonesia. The questionnaires were distributed to the target sample through email, and the respondents filled the questionnaire through Google Form. There are 53 submitted questionnaires, and 50 forms were valid. The characteristics of respondents are presented in Table 1.

#### 3.2. Variable of Interest

The study covers exploration innovation activities as an exogenous variable along with its five dimensions, namely, acquiring new technology and skill (AIER-1); learning program development skill (AIER-2); acquiring new managerial and organizational skill (AIER-3); learning new skill for the first time (AIER-4); and strengthening innovation skill (AIER-5). The study also puts exploitation innovation activities as mediating variable, consisting of five indicators: upgrading current knowledge and skill (AIET-1); improving skill in using current technology (AIET-2); improving competencies to solve the existing problems (AIET-3); upgrading skill in developing program (AIET-4); and strengthening knowledge and skill for efficiency (AIET-5). Finally, business process performance consists of five dimensions: effective communication (KBP-1); manage working time (KBP-2); presentation skill (KBP-3); ability to mobilize other (KBP-4); and critical thinking (KBP-5). However, after conducting a reliability test, some indicators did not fulfill the requirement of validity, they are AIER-1, AIER-5; AIET-1, AIET-3, KBP-1, and KBP-2.

The indicators were eliminated from the analysis. A five-point Likert scale questionnaire was used as an instrument to gauge opinion of the respondents.

#### 3.3. Statistical Technique

The collected data were analyzed through Partial Least Squares Structural Equation Modelling (PLSSEM) and using SmartPLS software version 3.0. This method is useful when the objective is prediction of the dependent variables to develop or extend theory (Hair, Sarstedt, & Ringle, 2012). The statistical technique is particularly useful for research that involves small sample sizes, suggesting that the method is the appropriate option for a sample with size of 50 cases.

### 4. Research Results

#### 4.1. Reliabilities and Validities of Constructs

The reliability measurement for each construct is presented in Table 2. It involves analyzing the individual reliability of the indicators on the latent variables through the outer loadings and the reliability of the internal scale or consistency through rho A and composite reliability (CR). Moreover, the analysis of validity conducted through the average variance extracted (AVE).

In Table 2, indicator loading of each variable is more than 0.7, which indicates that the acceptable range is fulfilled. Another reliability indicator, Cronbach's Alpha (rho A), indicates values greater than 0.60, which is more than the acceptability range. The number surpasses the acceptable value of Cronbach's Alpha that ranges from 0,6 to 0,8. The composite reliability (CR) for each construct was more than the minimum level of 0.70. Hence, this research fulfills the required cut-off values for Confirmatory Factor Analysis (CFA). The table indicates that the CR, and rho A of the LVs obtain values higher than 0.7, indicating reliable results. The convergent validity denotes how closely a construct is identified to other alternative measures of the same construct. It was evaluated from the AVE, which is ruled with an acceptable value of above 0.500.

**Table 1:** Characteristics of Respondents

Characteristic		Frequency	Relative Frequency
Sex	Male	31	62,00%
	Female	19	38,00%
Ages	<40 years	3	7,89%
	41–50 years	22	57,89%
	51–60 years	12	31,58%
	>60 years	1	2,63%
Job duration	<1 years	27	54,00%
	1–2 years	13	26,00%
	2–3 years	1	2,00%
	>3 years	9	18,00%
Level of education	Undergraduate	0	0,00%
	Magister	38	76,00%
	Doctoral	11	22,00%
	Others	1	2,00%
Number of student body	<100 students	10	20,00%
	101–200 students	15	30,00%
	201–300 students	10	20,00%
	>300 students	15	30,00%
Number of academic staff	<30 staff	30	60,00%
	31–50 staff	15	30,00%
	51–60 staff	3	6,00%
	>60 staff	2	4,00%
Type of HEI	Public Institution	37	74,00%
	Private Institution	13	26,00%
Study program	Technic / Technology	30	60,00%
	Health	4	8,00%
	Business, Administration and Accounting	16	32,00%

Discriminant validity ratio implies to what extent a construct is different from others. The criterion usually used for this source of validity evidence is Fornell and Larcker and Heterotrait-Monotrait Ratio (HTMT). Table 3 presents the results of both procedures managing to affirm that constructs have convergent validity, as the confidence interval for both parameters does not contain 1.

On the diagonal, the AVE; below the diagonal, the correlation between variables; above the diagonal, HTMT ratio; in brackets indicate the confidence interval and bias correlated confidence interval from bootstrapping 3000 samples.

**Table 2:** Quantitative Statistical Description for the Constructs. (Reliability and Convergent Validity)

Variable	Outer Loadings	rho A	CR	AVE
Exploration Innovation Activities (AIER)				
AIER-2	0.804	0.702	0.822	0.606
AIER-3	0.765			
AIER-4	0.765			
Exploitation Innovation Activities (AIET)				
AIET-2	0.787	0.775	0.859	0.670
AIET-4	0.800			
AIET-5	0.869			
Business Process Performance (KBP)				
KPB-3	0.863	0.852	0.868	0.687
KPB-4	0.771			
KPB-5	0.849			

**Table 3:** The Discriminant Validity using the Fornell and Larcker Criterion and the Heterotrait-Monotrait Ratio (HTMT)

Variables	AIER	AIET	KBP
AIER	0.606	0.866 (0.853; 0.803)	0.377 (0.486; 0.435)
AIET	0.673	0.670	0.461 (0.634; 0.592)
KBP	0.323	0.388	0.687



#### 4.2. Assessment of the Structural Model

Estimating the statistical significance of the path coefficients, the bootstrapping procedures with 3.000 samples without sign change were used. As shown in Table 3, the endogenous latent construct (AIET-AIET) obtains a value  $R^2$  of 0.453. Also, the AIET-KBP path indicates  $R^2$  value of 0.151. In scholarly research focus on management issues,  $R^2$  has values of 0.75 or 0.50 for endogenous latent variables and considered as substantial or moderate respectively (Hair et al., 2012). In addition, the  $f^2$  statistic value is 0.827 and 0.178. The guidelines for assessing  $f^2$  values above 0.35 represent a strong effect and between 0.15–0.35 indicates medium effect (Aberson, 2015). The result obtained from this procedure suggested that the two hypotheses tested are accepted. Hence, all the path coefficients are statistically significant.

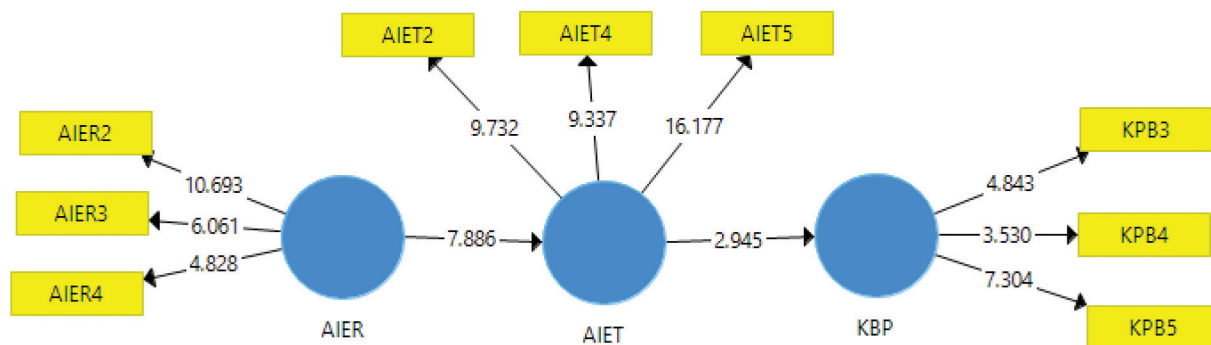
The research aimed to investigate the relationship between innovation activities and business process performance that involve two types of innovation activities in the continuum scheme. There are two hypotheses and the results show that both hypotheses are accepted. The relationship between exploration and exploitation activities was presented in significant pattern,

confirming that both activities fall into a continuum pathway in the innovation process (Duval-Couetil, Shartrand, & Reed, 2016), which is commonly initiated with exploration activities. It is commonly accepted that the leeway of knowledge into organization can be through accessibility to external organization, where innovation process can be described as a complex network of communication paths, involving intra- and inter-organizational in accommodating transfer knowledge (Marinova & Phillimore, 2003). Furthermore, when explorative activities are effectively implemented, it can stimulate and facilitate exploitative activities (Braunerhjelm, Ding, & Thulin, 2017). In the context of vocational institutions, Ruth and Deitmer (2010) point to the importance of building a strong relationship between institution and manufacturing sector. It is conducted to optimize the innovation process in the institution. The second hypothesis confirms that there is a positive relationship between exploitative activities and business process performance. The findings are relevant with the result of other seminal work in other industry contexts (Braunerhjelm et al., 2017).

Furthermore, the research contributes to the development body of empirical research on exploratory and exploitative innovations and business process performance. The study allows us to point out that exploration innovation activities denote a direct and positive effect on exploitative innovation activities, and thus confirms the positive relationship on business process performance in the context of higher education institutions. The underlying study extends current research in the area of innovation activities classification, exploration and exploitation (March, 1991), and of organizational ambidexterity, that connects both activities (Birkinshaw & Gibson, 2004; Koryak et al., 2018).

**Table 4:** The Evaluation of Research Hypotheses and Structural Model

Hypothesis	Path Coefficient	t-statistic	p-Value	$f^2$	$R^2$
AIER – AIET	0.673	7.760	0.000	0.827	0.453
AIET – KBP	0.399	2.892	0.004	0.178	0.151



**Figure 2:** The Result of PLS

This study confirms that in order to achieve better performance, innovation activities in HEI should be delineated in the continuum concept, initiated with exploration activities followed by exploitative one. Explorative activities are identified as being important in HEI business process, (e.g., in designing and updating curriculum) that highly require absorption capacity from industrial expertise and experience (Wahidmurni, 2020). Furthermore, the importance of collaborative relationships between HEIs and industry could lead the knowledge and technology transfer raised as mandatory process in innovation activities within HEI (Dell’Anno & del Giudice, 2015). The process of technology transfer in both organizations, considered as an explorative action, can synchronize between curriculum and industrial need. The current technology provides various platforms of communication that ease knowledge and capability transfer (Lee, Becker, & Potluri, 2018). Such activity is an entry point of new knowledge or technology that is being used and implemented in the industry, that should be taught for developing student capabilities.

On the other hand, exploitative innovation activities are no less important in contributing better performance in HEI. Such activities primarily involve the challenging of existing academic process, for example evaluating teaching and research method, appraising academic services to students, and assessing other academic activities. The significant efforts of evaluating current academic process mainly cover the quality assurance process, that is usually the important activities in HEI (Kis, 2005). Other kinds of activities that are relevant with exploitative is how to make academic process effective and efficient. Dimension of efficiency covers operational, academic, and managerial efficiency, which are commonly practiced in many HEI. Interestingly, leadership commitment, institutional autonomy, and staff engagement are also identified as key important aspects in the efficiency and effectiveness program in HEI (Kupriyanova, Estermann, & Sabic, 2018).

In the other industry context, innovation activities also proved as a significant determinant on firm performance, such as, food exporters industry in Thailand (Aujirpongpan & Hareebin, 2020) and human capital supply industry in Korea (Muafi, Siswanti, Diharto, & Salsabil, 2020).

## 5. Conclusion

The findings of this study reinforce the existence of positive interaction between both innovation activities that represents ambidexterity capacity, which positively affects the business process performance. For instance, knowledge transfer that is usually categorized as absorption capacity, reinforces the development of teaching methods and research areas (Sengupta & Ray, 2017). The study also suggests that collaborative research between industry and HEI may provide the benefit for ambidexterity framework.

The study basically is not free of limitations. First, the research was carried out in Makassar, Indonesia. It could not exclude that the specific context influences the results that may pose a generalizability problem. Therefore, relevant studies in the future should test the robustness of the outcome by considering cultural and organizational contexts. Furthermore, higher education institution usually differs from other business and even among the other higher education institution itself, in terms of structure, governance, and business process.

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