

Effect of Knowledge Integration as Mediation of TMTs Characteristic and Innovativeness in Higher Education Institution

Arief Prima Johan and Herri

Abstract—Many challenges have been faced by Higher Education Institutions (HEIs) in this recent decade, required them to seek new approach to ensure their sustainability. One of those is through innovation in program and strategies and encourage innovativeness of organization. We argue that one of determinant of organizational innovativeness is by taking attention towards knowledge integration within organization. Taking point from strategic leadership perspective in which based on upper echelons theory, this research aims to determine innovativeness through knowledge integration and its antecedents from top management teams (TMTs) characteristics in Higher Education Institutions (HEIs). Data were collected from 33 Higher Education Institutions (HEIs) in West Sumatera. Result shows cognitive diversity of TMTs has a negative effect toward knowledge integration. Diversity in knowledge which proxies by educational background diversity has a direct positive affect towards innovativeness. Knowledge integration has positive effect towards organizational innovativeness. Conclusion and some recommendations are discussed in the end of article.

Index Terms—Top management team, knowledge integration, Innovation, higher education institution.

I. INTRODUCTION

HEIs have been facing challenge in few decades. Technological “revolution” required them to adjust their approach in responding those challenges. HEIs need to explore their competencies continuously to produce innovative program, tactics and strategy to ensure their contribution in development. Even for survive in educational industry.

Based on the upper echelons theory introduced by [1], innovation produced by organization could explain from strategic leadership perspectives. Strategic leaders, namely top management teams, have a great influence to determine organizational future through their action in making strategic decision includes innovation. [2], [3]. Many research argued that characteristics and compositions of TMT could explain the outcome of organization.

Innovative decision often begins with gathering idea from much perspective [4]. With diverse characteristics of members among TMT, it is very possible that they have very

different idea about problem and opportunity. The differences in characteristic among members are consequences from diversity of their cognitive style, experience, and knowledge [5], [6].

That difference knowledge is embedding in each person as individual property and needs to integrate in order to take advantage from that property and give benefit to organization [7], [8]. Reference [5] suggests that integrating diverse knowledge in organization is an important process to ensure organization get benefit rather than disadvantages from that diverse.

Knowledge integration could be influenced by TMTs characteristics. Many researches have been focused on diversity in its characteristics. Result in this topic remains inconsistent. Many researchers argue that diversity in TMTs gave benefit towards organization [9]-[11]. They suggest diversity gives advantages through broader perspectives bring by each member. Others result concluded that TMTs diversity also evoke personal conflict among members and harmed organization [2], [6], [7], [12], [13].

Reference [14] argue that inconsistency was resulted from mistreatment of each variables used in their research. Many research used single conceptualization to define few diversity variables that conceptually different [14]. Diversity grouped into one of three classifications, as separation, variety, or disparity [14]. Each classification have different conceptual definition. Consequently, different kind of diversity cannot conceptualize as single definition [14].

Diversity in separation is the difference among member in same horizontal continuum, regarding about their position towards same continuum [14]. This diversity often reflect different in belief, cognitive style, opinion etc. Continuum of separation does not reflect out lead position between each other. Diversity in variety differentiate member as classification and mutually exclusive different among them [14]. It is often reflect kind of knowledge owned by each member. Finally, diversity in disparity show different among members in vertical continuum which could reflect different in power between members.

We use two kind of diversity, which is as separation and variety. Diversity as disparity does not use because it might already occurred with same variance between team. Each TMTs in HEIs is lead by one top leaders, which is rector, dean or president of university. The top leaders have more power than other in team. Consequently he/she is out led other member [14].

Cognitive diversity is used as separation. It reflects different position among member about their belief in cognitive. This different often associated with negative

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impact toward organization because the continuum is about fundamental belief which hard to negotiate.

Another diversity is educational background diversity which reflect different kind of dominant knowledge owned by each of leaders. This diversity could be grouped into diversity as variety which is differentiating between people in mutually exclusive way. Diverse in knowledge often associated with positive result toward organization because of enrichment and enlargement of information and perspective in decision making.

II. THEORY AND HYPOTHESIS

Reference [15] defined innovativeness from two perspectives. The first views as a behavioral view, which is the extent to which adoption of innovations by the firm. The second view is an organization's willingness to change and implement the new idea into organization system.

Top management team diversity refers to heterogeneity of characteristics among top team members [3]. Each diversity of characteristics has classification either as separation, as variation or as disparities [14]. Cognitive diversity defined as heterogeneity of normative and cause-effect belief among team members about organizational purpose [6]. This variable grouped into diversity of separation which shown diverse among member in the same horizontal continuum [14].

Diversity in knowledge seen from extends to which heterogeneity of educational background among team members [2], [9], [12], [16]. This variable classified as diversity of variety in which exhibit different variety among members as mutually exclusive variety [14]. We also use educational background specialization in order to capture more accurately the diversity of knowledge in HEIs leadership.

Knowledge integration conceptualized as the process of jointly applying specialized knowledge held by team member in decision making process [17]. Integration of diverse knowledge among team members shaped and established new knowledge which held by organization. Its knowledge could drive organizational innovativeness [17].

Cognitive style of leaders came from accumulation of their long experience of work and life. Consequently, its difficult to change and tend to endure for long time [6], [18]. Basic difference in cognitive is about goal and purpose of organization derived from long experiences, while integration of knowledge need synergy among team and understanding about knowledge held by others members. It will be hard to synchronize this diverse knowledge among team, especially if each other had a different goal and purpose regarding benefit of their knowledge toward goal and purpose of organization. Moreover, rather than synergize to integrate their knowledge, leaders will stuck in discussion of fundamental issues about goal and purpose in decision making processes.

Hypothesis: TMTs cognitive diversity has negative effect towards knowledge integration.

Educational background reflects dominant knowledge and capability of team members [14]. Diversity in their educational background has shown the heterogeneity of dominant knowledge and capability among team which also

point them to different source and kind of information [16]. That information put on by each leader as perspective in making decision comprehensively [6]. Large impact of knowledge integration appears if there are sufficient diverse knowledge could be integrate in team that held by different members. Therefore, presence of many kind of knowledge and capability in team could increase probability to integrate these knowledge [8].

Hypothesis: Educational background and educational specialization background have positive relationships toward knowledge integration.

Integrate the knowledge could enlarge leader's perspective while making decision. In turn, it could generate more accurate analysis and judgment about problem and opportunity faced by organization [18]. Moreover, integration of knowledge might result knew perspective as a result of integration. Broaden and more perspective in decision making, especially if problem has defined accurately, could bring decision makers toward new approach and solution [19].

Hypothesis: Knowledge integration has positive relationship towards innovativeness and mediates the relationships between TMTs characteristics and innovativeness.

III. METHOD

A. Data and Sample

Our analysis is conducted from top management team of HEIs in West Sumatera. Each institution were sent a package contain of five copies of questioner to respond by each of their top management. Each questioner contains of same indicator to measure variables and characteristics of respondent. We sent 80 packages to TMTs of HEIs and has been responded by 44 of them. 11 packages cannot use for further analysis because of incomplete fulfillment. to in that institution. Total unit of analysis that can be used to test hypothesis was 33 TMTs of HEIs which contains of 136 leaders.

Measures

B. Educational Background Diversity

Respondents were asked to indicate their major in education to reflect their educational background. We also asked them to write down their area of expertise that they choose in their highest education to indicate *educational background* specialization. To measure diversity of these two variable, we used Blau's index ($1 - \sum i^2$, where i is the proportion of respondents in the i th category). That procedure has been used in many research in topic of strategic leadership and diversity [2], [14], [16]. We use index of quality variation to standardize the diversity's score because of different size of team [14].

Cognitive of TMTs member was measure with four indicator developed by [6]. They measures cognitive diversity from two mutual support perspective which are from goal preferences/normative belief and cause effect belief regarding organization goal and purpose. Standard deviation was used to measure *cognitive diversity* among team [19]. This processes, to indicate diversity of separation which have been use in many research [2], [6], [7], [12], [13] [20].

Knowledge integration was identified through three indicators which adapted from [17]. Organizational innovativeness was measured by six questions which adapted from [15]. Both variables were aggregated to organization level using average method.

Hierarchical mediated regression method was used to test hypothesis. We used [23] suggestion about three steps to conclude the presence of mediated relationships between three variables.

IV. RESULT

Table I explains descriptive data and correlation between each variable. Innovativeness in HEIs is high with score 5.23 from seven scale. Mean of cognitive diversity is low with score .47. It implied that variance among team regarding of their goal and purpose of organization is not too different. Mean of educational background is moderate which have score, 48. High score on educational background specialization (.94) implied that TMTs came from very different field of expertise. Knowledge integration in HEIs is also high with score 5.83 from seven scale.

On the correlation matrix could see that negative correlation between cognitive diversity and innovativeness ($\beta=-.325$) and positive correlation between innovativeness and knowledge integration ($\beta=.528$). positive correlation also occurred between educational background and educational background specialization ($\beta=.342$).

TABLE I: THE CORRELATION MATRIX BETWEEN VARIABLES

Variables	Mean	Std	In	Cd	Eb	Ebs	Ki
In	5.23	.62	1				
Cd	.47	.32	-.32*	1			
Eb	.48	.26	.27	.20	1		
Ebs	.94	.12	.05	-.10	.34*	1	
Ki	5.83	.52	.53**	-.27	.17	.10	1

In : Innovativeness
 Cd : Cognitive diversity
 Eb : Educational background diversity
 Ebs : Educational background specializaion diversity
 Ki : Knowledge Integration'

Table II explains result from hypothesis analysis. Hypothesis 1 which predict negative relationship of cognitive diversity towards knowledge integration supported by data ($\beta= -.451, p< .05$). Hypothesis 2, which predict positive relationship between educational background diversity towards knowledge integration is not supported by data ($\beta= .183, p> .10$). Another positive prediction between educational background specialization and knowledge integration, is also not supported by data ($\beta= .010, p> .10$). Hypothesis 3, which predict positive relationship between knowledge integration and innovation is supported by data ($\beta= .42, p< .05$).

Mediated prediction by knowledge integration in relationship between TMTs characteristics and innovation is partially supported. Rules of mediation by [21], fulfilled on relationships between cognitive diversity, knowledge integration as mediation, and innovativeness. Coefficient between cognitive diversity and innovation in third equation ($\beta= .31$) is lower than its coefficient in first equation ($\beta= .45$). Mediated relationship by knowledge integration is not occurred between educational background diversity and

innovativeness, as well as educational background specialization and innovativeness.

Another result from analysis, that yet not hypothesize before, is direct effect of educational background towards innovativeness ($\beta= -.451, p< .05$).

TABLE II: THE ARRANGEMENT OF CHANNELS

Variables	In	Ki	In (Full Model)
Cd	-.45**	-.31*	-.32*
Eb	.41**	.18	.34*
Ebs	-.13	.01	-.14
Ki			.42**
F-Test	3.05	1.14	4.67
R ²	.24	.11	.29

* $p<.10$, ** $p<.05$

V. DISCUSSION

Result shows that cognitive diversity has negative effect towards knowledge integration. It implied that TMTs, in which its members diverse in the matter of their belief and preference regarding purpose and goal of organization, difficult to synergized among them to integrate their knowledge. It might occur because of every members tend to stand and fight for what they belief each other. Moreover, might be there is unwillingness to integrate the knowledge before they made consensus about goal and purpose. This result is supported previous study by [6], [7], [22].

Both educational diversity and educational specialization diversity was not supported by data. Its might occurred because variance sensitivity in both variables. Low variance in both variables as consequences of small sample might be reducing the accurate on measuring relationship. Another reason is because their structured and highly regulated work have made knowledge integration issue is not crucial in the matter of their basic knowledge.

Direct effects of educational background towards innovativeness indicate that innovative solution or idea might be came from basic knowledge owned by each members. That idea does not need to integrate at first time, but need to discuss among them.

Knowledge integration has positive significant effect toward innovativeness. This result supported argumentation in hypothesis, stated new solution might be occurred because of accurate assessment of problem and opportunity by TMTs. Innovative solution can be resulted from broader perspective owned and used by TMTs as consequent of knowledge integration. This result also supported prior study by Ahuja and [17], [18], [23].

Mediated effect of knowledge integration in cognitive diversity and innovativeness relationship implied that TMTs who have different view about goal and purpose difficult to increase their innovativeness because cannot taking advantages in knowledge integration processes. It was resulted from basic different among team about fundamental aspect that cannot change in easy way. Thus team should made consensus among them about basic goal and purpose or organization including their specific target at the first time.

This result suggests that HEIs should encourage knowledge integration among their TMTs member, especially in strategic decision making. It is important to achieve innovative decision to ensure their sustainability in educational industry. Furthermore, to achieve appropriate

knowledge integration, they should making consensus regarding organization goal and purpose at the first time.

Consensus is needed to make sure integration process go along in the same page among each other. Another implication was suggestion to HEIs to have diverse TMTs characteristic in their dominant knowledge to encourage innovativeness within organization.

VI. CONCLUSION

Research about the effect of TMTs is still on inconsistency and debatable result. Many researchers got different result about the effect, especially in different context and setting. Difficulties to get a large sample in this topic of research might be affecting these inconsistency.

Diversity issue in organization at the top level influence organizational outcome through their composition of characteristics and other process variables. This research also concludes that need for taking attention to knowledge management issue, especially knowledge integration to encourage organizational innovativeness.

Future research should use larger sample size and multi setting to seek generalization of relationship. Furthermore, researchers also encourage considering many contingency issue could affect TMTs characteristic through interactional effect and interactional effect between their characteristics.

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