



ORGANIZATIONAL INNOVATION AND INNOVATION  
ADOPTION AMONG PHILIPPINE FOOD PROCESSING  
MICRO, SMALL, AND MEDIUM ENTERPRISES

Roslyn Dongzal Tambago  
Dr. Emilio B. Espinosa, Sr. Memorial State College of Agriculture and Technology  
Cabitan, Mandaon, Masbate, Philippines  
Email: rdtambago@gmail.com

Abstract

Innovation has become a viable pathway for the transformation of society, business, and other forms of organization in the age of globalization. Specifically, the diffusion of innovation, in any form, has remained a critical challenge among change agents in as much as innovation adoption is among entrepreneurs. This paper aims to investigate the interplay of organizational innovation and innovation adoption decision making process in technology-based food processing business organizations toward creating a growing trend for innovation adoption in the manufacturing industry across the country. The measurement of the variables was realized through a quantitative-descriptive-explanatory research design. A total of 48 respondents representing the management group and 221 participants comprising the production group coming from government assisted food manufacturing firms in the Philippines are involved in the study. Both respondent groups are examined for the organizational innovation variable, but only the management group was investigated for the innovation adoption variable using an adapted survey questionnaire. Results show a varying perception between the respondents in the management group and production group on the extent innovation characteristics resemble their organization. Conversely, a favorable perception on the innovation program under review warranting innovation adoption is manifested by the cluster of decision makers in this research. Positive associations between the constructs of organizational innovation and innovation adoption have been verified. Ultimately, the innovation culture antecedent is found to significantly contribute to innovation adoption among decision makers.

Keywords: organizational innovation, innovation culture, innovation adoption, technology-based enterprise development, innovative management

Introduction	given its low ranking status, 52 <sup>nd</sup> out of 144 countries, in the Global Competitiveness Report 2014-2015 of the World Economic Forum. Poor infra-
Global competitiveness remains a critical challenge for the Philippines	

structure, inadequate technological readiness, and insufficient capacity for innovation are the major factors linked to such low rating.

Recognized as a key driver of competitiveness, economic output, and productivity (Macasaquit, 2008), innovation is therefore essential for Philippine business organizations to undertake in order to amplify the country's competitive edge in the globalized economy. The government has endeavored to create "conditions conducive to the growth and competitiveness of private businesses, big, medium and small" (Malacañan, 2010). Specifically, training on innovation, entrepreneurships, and assistance to micro, small, and medium enterprises (MSMEs) are among the key strategies identified in the country's "inclusive growth" development roadmap (Balisacan, 2014).

Through the Department of Science and Technology (DOST), the premier government body in the advancement of science, technology and innovation (STI) in the Philippines, the government has succeeded in institutionalizing a comprehensive innovation system support mechanism, called the Small Enterprises Technology Upgrading Program (DOST SETUP) for micro, small, and medium enterprises (MSMEs). Implemented in 2002, DOST SETUP is a nationwide strategy encouraging and assisting MSMEs to adopt technological innovations to improve their products, services, and operations that are all geared towards up-scaling the firm's productivity and competitiveness (DOST SETUP, 2013). It constitutes a package of technical interventions such as infusion of

appropriate technologies to improve products, services and operations through fund assistance; human resource training, technical assistance and consultancy services; design of functional packages and labels, among others for eight priority sectors that include the food processing industry.

In spite of these initiatives, the DOST has perennial difficulty attracting MSMEs into the program, let alone making the latter fully adopt the former's STI recommendations. The 2011 data at the Philippine Statistics Authority (PSA) show that there have been a total of 816, 759 MSMEs in the country. Of the figure, only 0.3 % (2,270) have availed of DOST SETUP since its implementation in 2002 up until 2013. Majority (43%) of the DOST SETUP beneficiaries comprised the food manufacturing sector. In Central Visayas, the food processing industry is one of the top exporting and job generating sectors that has been continuously showing high growth potentials for local and export market. However, its capacity to innovate remains low. Cost factors, lack of information on technology, and difficulty finding cooperation are among the innovation barriers cited in a latest study (Jaque, 2009). The foregoing statistical trends and concerns mirror that of the regions, including Central Visayas, across the country (Jaque, 2009).

There has been an escalating interest in studying innovation in the country (Gonzales & Yap, 2011; Mytelka & Smith 2001), however much have yet to be desired in strengthening the capacity for innovation of its major economic backbone—the MSMEs, which represent 99.6% of

the country's business enterprises (PSA, 2011). For a country or an organization to attain a strong innovation capacity, the World Economic Forum places a high premium on developing a healthy, well-educated and trained workforce that is adept at absorbing new technologies (Schwab, 2014).

Moreover, majority of available local studies on innovation focus on technological innovations (DOST-STII, 2014) and little has been done so far about organizational innovations that introduce changes in structure, strategy, administrative processes, and practices. Also, there has not been a wealth of local studies that focuses on establishing a relationship between the two organizational phenomena, organizational innovation and decision making process, in the context of innovation, hence this research.

Results of the study hope to provide organizational development and management measures to further cultivate the attributes and culture of innovation and innovation adoption capability of food manufacturing companies.

## Conceptual Foundations

### *Organizational Innovation*

Many modern scholars contend that a unified and commonly accepted understanding of the innovation concept has yet to be reached (Kotsemir, Abroskin & Meissner, 2013). Nonetheless, the basic definitions and types of innovation can be found in the series of manuals of the Organization for Economic Cooperation and Development (OECD). The Oslo Manual of the

OECD, containing the latest revisions of these manuals defines innovation as “the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations” (OECD, 2005, p. 46).

Organizational innovation is one of the three types of process innovation, along with marketization innovations, and technological innovations. Organization innovations are concerned with an organization's primary work activity and changes in the social system which may include changes in structure, strategy, administrative processes and practices (Kotsemir, et al, 2013).

The culture of innovation is an environment that supports creative thinking and advances efforts to extract economic and social value from knowledge, and, in doing so, generates new or improved products, services or processes (Hepburn, 2013). In the life of an organization, innovation culture being “the sum of self-sustaining patterns of behavior, thinking and deciding that determine how a firm sees and conducts innovation” is regarded as one of the cornerstones on which innovation success builds, along with strategy, processes, management, and networks (Mattes, 2014).

According to Morris (2011), organizations that are successful at innovation naturally develop a strong innovation culture. Morris further points out that for a business organization to develop a strong culture of innovation, innovative behaviors and attitudes,

structures and tools should be coupled with actions that result in innovations of all types such as breakthroughs, useful incremental changes, and even radically new ways of doing business.

For an organization to facilitate innovativeness, a United Kingdom study findings recommend that the organization should be open to change, encourage value free communication and new or unusual ideas, tolerate mistakes, and nurture intrinsically motivated staff. This requires leaders who advocate these characteristics as shared values, while challenging and empowering the rest of the organization's members to generate new ideas in a drive to further innovation (Auernhammer & Hall, 2014). The same study identified three main determinants that underline innovation: 1) structured 'space' that creates expertise and experience of individuals while working in routine; 2) willingness to innovate – individuals' propensity to experiment with ideas, even at risk of failure; and 3) authorized and dedicated 'space' designated specifically for individuals to explore new ideas.

In an attempt to study the culture of innovation of Philippine business and government organizations, the Ateneo-Center for Organization Research and Development (Ateneo-CORD) identified seven factors that characterized organizational innovation. These factors are strategy (the extent to which the organization cites innovation in its mission, vision, values or goals), leadership (measures whether organization leaders serve as role-models for innovation and are open to suggestions and new ideas; whether there exist good relationships

between management and employees; and whether leaders are perceived to be trustworthy and care for employees), relationships (measures the quality of relationships and teamwork between employees and units), human resource development or HRD (the extent to which the organization provides training and development programs to build both technical and innovation capabilities), engagement (the extent to which organization members care about the organization and are willing to go beyond what they are required to do for the good of the organization), management of innovation (refers to systems in place to generate ideas, measure, reward and provide resources and employee time for innovation related projects), and innovation culture (employees' perception of whether their company is innovative, risk-taking, open to change, experimental and values innovation). Based on the above discussion, the first hypothesis is proposed:

H1: There is a significant difference in the perception level of organizational innovation between the management group and the production group.

### *Innovation Adoption*

Decision making is defined as a cognitive process leading to the selection of a course of action among alternatives that eventually produces a final choice. It can be an action or an opinion. "It begins when we need to do something but we do not know what. Therefore, decision making is a reasoning process which can be rational or irrational, and can be based on explicit assumptions or tacit

assumptions" (Kennerley & Mason, 2008, p.7). The same authors assert that better understanding of the situation demands understanding what influences the extent to which decision makers use data rather than judgment or intuition. Accordingly, this balance of approach depends on the personality of the decision maker, perceived reliability of the data, type of decision, and experience or expertise of the decision maker.

The concept of innovation decision making process (Figure 1) was solidified by Everett Rogers (2003) in his four decades of developing the Diffusion of Innovations Theory, which basically seeks to explain at what rate, how and why new ideas and technology spread through cultures.

Rogers' concept was derived from his definition of innovation: an idea, practice, or object that is perceived as new by an individual or other unit of adoption, and his understanding of its connection with newness. The criterion of novelty of innovation is determined by the choice and the perception of innovation of its adopters. The idea, object or practice is considered innovative during the period of its perception as new by the representative adopters. Acs, Anselin and Varga (2002) and Strambach (2002) maintain that the use of new products, services, processes and paradigms that are embedded into existing innovation leads to new ways of thinking and new knowledge. As a result, this iterative cycle of knowledge and creation of new knowledge, leads to an intensification of the innovation processes.

Figure 1. A Model of Five Stages in the Innovation-Decision Process

Innovation adoption is functionally understood in terms of the persuasion stage of Rogers' model, wherein a decision-maker's favorable or unfavorable attitude towards an innovation is formed. According to Rogers (2003), it is at this stage that the individual becomes more psychologically involved with the innovation, actively seeks information about it, decides what messages are credible, and decides how to interpret the information received. The perception of an individual towards an innovation plays a critical role at this point of the innovation decision making process.

Rogers maintains that innovations that are perceived by individuals as having greater relative advantage (the degree to which an innovation is perceived as better than the idea it supersedes), compatibility (the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters), trialability (the degree to which an innovation may be experimented with on a limited basis), and observability (the degree to which the results of an innovation are visible to others) and less complexity (the degree to which an innovation is perceived as relatively difficult to understand and to use) will be adopted more rapidly than other innovations (p. 175). The construct "trialability," was consciously omitted here by inapplicability with the research variable at hand. Since the respondents have already implemented or continually put into practice the innovation, it is expected that that they have a positive regard to the innovation, which is referred here as the DOST SETUP.

H2: The management has favorable perception towards innovation.

As presented in Figure 2, examining the factors at how business managers arrived at the decision to adopt the innovation through knowledge recall is the main focus of this research. Moreover, since looking at organizational innovation as a whole involved not only the leaders of the organization, members of other units that assemble a Philippine small-scale enterprise were covered as well.

### *Organizational Innovation and Decision Making Process*

A number of social scientists argue that organizational culture, along with other organizational core elements such as leadership, communication and behavior can aid individuals in developing a mental model which will guide decision makers towards the right decision (Kennerley & Mason, 2008; Dreher & Tremblay, 2009; Morris, 2011). These studies however provide equivocal findings as to exactly how organizational innovation impacts innovation decision making process, particularly in business organizations. Hence, this hypothesis:

H3: Organizational innovation is associated with innovation adoption.

## Methods

### *Design*

This undertaking is a quantitative-descriptive-predictive research that explored the variables using the self-administered survey method, which was subjected to statistical analysis. The major variables that were investigated in this study are the

Figure 2. Conceptual Framework

organizational innovation as the independent variable and the innovation adoption decision making process as the dependent variable. Organizational innovation was explored using the seven indicators of innovation in the organization as identified by the Ateneo-*CORD*, namely, communicate desired values, role modeling of leaders, engage employees, align systems and structures, train for culture, evaluate and recognize exemplary behavior, and innovation culture.

On the other hand, the innovation decision making process was measured by adapting Roger's second stage of five stages of his model on innovation decision making process, that is, persuasion stage. Only this stage was given substantial emphasis and sub-

jected to a thorough statistical analysis in this study since this is the most critical stage of the process as proven in a number of past studies and more importantly, the respondents already adopted the *DOST SETUP* innovation.

This study has two categories of respondents: the management group and the production group. The respondents were prequalified based on position and employment period, that is, only firm owners or those occupying a managerial post and production workers who were employed for six months and above in their current company were asked to take the survey.

#### *Setting and Sampling Strategy*



This research was conducted in Central Visayas (Region VII), Philippines. Employing purposive sampling method, it targeted the DOST SETUP-assisted food processing in the area from 2002 to 2013. Based on the official record of the DOST SETUP National Project Management Office, there are a total of 62 firms that availed of the program in Central Visayas during the same period or in its 11 years of implementation. Of the figure, 54 (88%) were reached for this undertaking. The balance was no longer in business.

#### *Data Collection Techniques*

Two instruments were used in this study. To measure the organizational culture of innovation variable, the Ateneo-CORD Innovation Study survey questionnaire was used. This tool was administered to the respondents of both management group and production group.

#### *Innovation Study.*

A five-point Likert scale survey, the Innovation Study contains 35 items that solicited the respondents' views about their company in terms of dealing with the various aspects of innovation. For every item, the respondents were asked to mark the appropriate numbered box that they think fit their firm's description: 1 – "Not at all my company"; 2 - "A little like my company"; 3 – "Somewhat like my company"; 4 – "Very much like my company"; and 5 – "Exactly like my company." To describe the extent of the respondents' assessment of their company's innovation culture, the mean scores were reduced into five ranges as

follows: 1.0 - 1.7, 1.8 - 2.5, 2.6 - 3.3, 3.4 - 4.1, and 4.2 - 5.0.

This tool measures the perception of the respondents on the seven factors characterizing organizational innovation as applied in this study, namely, communicate desired values (C), role modeling of leaders (R), engage employees (E1), align systems and structures (A), train for culture (T), evaluate and recognize exemplary behavior (E2), and innovation culture (I). The major 35 items measuring the innovation variable were completely adopted in this study. Additions in the survey were questions that sought both company and personal background information from the study participants.

#### *Innovation Perception Survey.*

In the inquiry into the second variable of the study, the innovation adoption decision making process, the Innovation Perception Survey was used. This tool is a standardized questionnaire adapted from Ntemana and Olatokun (2012) in their study "Analyzing the Influence of Diffusion of Innovation Attributes on Lecturers' Attitudes Toward Information and Communication Technologies". The questionnaire underwent a validation from five experts on DOST SETUP implementation, technology management, and organizational psychology. To determine the consistency and reliability of the multiple item scales, Cronbach's alpha coefficient was used and yielded a value of over .70 indicating acceptability, over .80 indicating good, and excellence when over .90 (i.e. relative advantage [5 items]-0.71, complexity [5 items] – 0.97, compatibility [5 items]– 0.81, observability [4 items] – 0.93, and trialability [ 5



items]– 0.74) (Ntemana and Olatokun, 2012, p.185).

The original tool has a total of 24 items that were clustered into five characteristics based on Rogers' innovation decision framework. The adapted tool has 19 items in total following revisions through content validation. This survey tried to gather the views of the management respondents about the DOST SETUP as a business innovation intervention prior to their decision to adopt the program in their respective establishments. This tool specifically corresponds to the examination of the Persuasion Stage or the second stage in Rogers' five-stage innovation-decision model. Using a four-point Likert scale, the tool asked respondents to strongly agree (4), agree (3), disagree (2) or strongly disagree (1) on each of the given statements. . The mean scores gathered from this instrument were categorized into four groups: 1.0 - 1.74, 1.75 - 2.49, 2.50 - 3.24, 3.25 - 4.0.

The gathering of data was done by administering the questionnaires to the firms identified in the study. Hard copies of the instruments, accompanied by a request letter, were given to the respondents through personal delivery. A few respondents opted receiving and returning the forms through e-mail. The retrieval of the majority of the filled questionnaires was also done personally.

### Analysis

This study used statistical analysis applying descriptive statistics (e.g. mean, standard deviation, percentage) in measuring the scores of the survey instruments and in the profiling of the

research respondents. Inferential statistics such as Pearson Product Moment of Correlation  $r$ , t-Test for Independent Group, t-Test for Correlated Groups , and Stepwise Multiple Regression Analysis (Stepwise).

To determine the perception level of organizational innovation for each respondent groups, means were used . To test whether or not there is a significant difference between and among the organizational innovation mean scores of management and production, t-Test for Independent Groups was applied.

To determine the relationship between organizational innovation (independent variable) and innovation adoption (dependent variable), Pearson Product Moment of Correlation  $r$  was used. In addition, the strength of the relationship between two correlated variables was determined by using Cohen's (1988) conventions.

Meanwhile, Stepwise determines the predictive power of a dependent variable from any of the independent variables involved. In this case, independent variables are considered in the regression model and tested if they are significant predictors. If one or more of the independent variables are not a significant predictor, one variable at a time will be removed from the model. This process of elimination is repeated until significant predictors are found and listed in the ANOVA table. With Significance  $F = 0.0000$ , it implies that the regression model is significant. This statistical test was particularly applied in determining the predictors of organizational innovation and that of innovation adoption.

Results

*Organizational Innovation*

Results as shown in Table 1 reveal that the production workers' mean score (3.49) is higher than their employers' (3.22). Meanwhile, the p-value (0.0134) rendered by the t-Test, which is less than  $\alpha=0.05$  tells that the

variation of the scores among the respondent clusters is significant. The score of management falls on the middle range, while that of production belongs to the upper range the five-point Likert scale. The t-Test for Independent Groups results showed that their scores are significantly different with a p-value of less than  $\alpha=0.05$ .

Table 1. Level of Innovation

Respondent Group	Mean	Standard Deviation	t-statistic	p-value
Management	3.22	0.86	2.4896	0.0134*
Production	3.49	0.65		
Overall Mean	3.35			

\* p-value < 0.05

*Innovation Adoption*

Results revealed that the participants' perception toward the innovation introduced was favorable in terms of relative advantage, compatibility, observability, and complexity. As presented in Table 2, the overall mean of 3.68 belongs to the highest range

(3.25- 4.00) of the four-point Likert scale. It can also be observed that the innovation attributes pertaining to Relative Advantage and Compatibility gained the first two highest scores, 3.55 and 3.36, respectively, followed by Observability with 3.03, and Complexity got the lowest mean of 2.18.

Table 2. Innovation Adoption Level of Managers

Innovation Characteristics	Mean	Innovation Characteristics	Mean
Relative Advantage	3.55	Observability	3.03
Compatibility	3.36	Complexity	2.18
Overall Mean 3.68			

*Organizational Innovation and Innovation Adoption*

Table 3 show that all factors were positively correlated with factors Align Systems and Structures, Train for Culture, Evaluate and Reinforce, and Innovative Culture displaying moderate

associations having correlation coefficients ranging from 0.21 to 0.33, while Communicate Desired Values, Role Modeling, and Engage Employees indicators suggesting small associations having correlation coefficients ranging from 0.11 to 0.19 (Cohen, 1988).

Table 3. Relationship Between Innovation and Innovation Adoption

	Innovation Study						
	Communicate Desired Values	Role Modeling	Engage Employees	Align Systems & Structures	Train for Culture	Evaluate & Reinforce	Innovation Culture
Innovation Adoption	0.11	0.19	0.18	0.32	0.28	0.21	0.33

Interpretation: 0.1=small/little/weak; 0.3=moderate; 0.5= strong (Cohen, 1988)

The strength of the relationship between two variables was based on Cohen’s (1988) conventions, a practice common to psychological researches, which interpret the effect size of the correlation coefficient. A correlation coefficient of 0.10 is said to represent a weak or small association; a correlation coefficient of 0.30 is considered a moderate correlation; and a correlation coefficient of 0.50 or larger is thought to represent a strong or large correlation.

*Predictor of Innovation Adoption*

The foregoing results pave the way for the investigation of the fundamental research question here, that is, whether or not the organizational innovation factors influence innovation

adoption. Judging from Table 4, only one of the seven antecedents of innovation appeared to significantly explain innovation adoption. For the decision makers, it is only innovation culture (I) that influenced their decision to adopt the DOST SETUP.

Discussion

The use of individual responses to measure culture in work units is common in organizational culture research (Glisson & James, 2002). Moreover, the move of involving employees in examining innovation in this study somehow addressed a limitation of previous related studies which only included managers, sans workers, in trying to examine innovation in a corporate setting (Wolf, Kaudela-Baum, & Meissner, 2012).

Table 4. Predictor of Innovation Adoption

	Df	SS	MS	F	Significance F
Regression	1	0.3168	0.3168	5.5295	0.0230*
Residual	46	2.6354	0.0573		
Total	47	2.9522			
	Coefficients	Standard Error	t Stat	P-value	
Intercept	2.3502	0.1195	19.6666	0.0000*	
Innovation Culture (I)	0.0923	0.0393	2.3515	0.0230*	

\* p-value < 0.05

*Organizational Innovation of Management and Production*

Consistent with current related literature, business organizations with an innovation culture is viewed as adaptable, flexible, experiment with new ideas, innovative, risk taking, open to change, and values innovation (O'Reilly, Chatman & Cladwell, 1991; Hechanova, 2011).

Scored lower than the production group in innovation, management can learn from its production workers and build upon the latter's innovation receptiveness by setting up systems or structures that welcome and recognize innovative ideas and initiatives from the floor.

It has been observed that creating an innovative culture is totally intertwined with creating a learning organization structure. Since innovation is fundamentally about effective learning, management may provide a work environment that promotes collaborative, inquiry, experimentation, tolerance for risk, and an acceptance of and commitment to learning from setbacks or

failures (Kasper, 2008; Auernhammer & Hall, 2014).

In addition, the result may mean that the employees display a higher degree of certainty on their thoughts about their company in relation to innovation culture than their employers. This finding affirms some related literatures that stress the involvement of the different organizational units in spreading or communicating culture in the organization. Cultural communications may be a management task, however, organizational behavior practitioners maintain that organizational socialization or the process of transmitting key elements of an organization's culture to its employees has a reciprocal function by which employees can also have an active impact on the nature of the organization's culture and operations. "Individualization occurs when employees successfully exert influence on the social system around them at work by challenging the culture or deviating from it" (Newstrom, 2011, p.99).

This study found a significant difference in the perception on the level of organizational innovation between the employers and the employees involved in this research. This finding may imply that each camp has an independent assessment on the subject matter. A varying opinion between management and production may call for a unified understanding as to how innovation culture plays out in their organization. Forerunners in the study of organizational culture underscore the importance of collective values in the organization. They contend that a strong culture is shared by organizational members, in which most members in the organization show consensus regarding the values of the company. The stronger a company's culture, the more likely it is to affect the way employees think and behave (Arogyaswamy & Byles, 1987; Chatman & Eunyong Cha, 2003).

#### *Organizational Innovation*

The above findings upheld past related researches. Rogers' (2003) compilation of researches on innovation diffusion for over 40 years led him to generalize that "the relative advantage of an innovation, as perceived by the members of a social system, is positively related to its rate of adoption" (p. 233). According to Rogers, the level of relative advantage, the degree to which an innovation is perceived as being better than the idea it supersedes, is often expressed as economic profitability, as conveying social prestige, or in other ways.

In this research, the questions asked in this aspect were all in the nature of economic advantage. Thus, it could be inferred from the results that

majority of the respondents viewed the DOST SETUP as something that would bring in more economic benefits to their company. They must have held with the promise of improved production efficiency, productivity, and competitiveness associated with the application of the DOST SETUP as put out by the project implementers.

In a number of instances, researchers have proven innovation adoption, a means of creating change in the organization, as a precursor to innovative behavior and organizational effectiveness. For example, Damanpour and Schneider (2006) advanced that innovation adoption facilitates adaptive behaviors that are intended to maintain or improve the organization's level of performance.

Xerri, Brunetto, and Shacklock (2009) added that developing the innovative behavior of employees can give organizations the upper hand when seeking to remain competitive or gain a competitive advantage.

In the aspect of the compatibility dimension, the mean score of 3.36 finds itself in the "strongly agree" scale. Supporting Rogers' (2003) findings, the management respondents viewed the DOST SETUP as consistent with the existing values, past experiences, and needs of potential adopters. They also agreed that the innovation entails more benefits than costs; and that it is valuable in all their business functions.

In terms of observability, the result demonstrated how the value of seeing the benefits of the innovation from other users helped form the respondents' attitude towards the innova-

tion. Rogers (2003) presupposed that observability is positively associated with the rate of innovation adoption. The evidence here could also be understood in the light of social learning theory wherein by observing the actions of other people one is able to gain new knowledge or information they can use to alter their own behavior (Newstrom, 2011).

In terms of complexity, the respondents regarded the DOST innovation program as relatively easy to implement or understand, or convenient to follow. How to further reduce the complexity in the perception of innovation as it is introduced to potential beneficiaries is a valid point of concern on the part of the change agency under study. In Rogers' book (2003), the lower the complexity of an innovation, the higher the rate of adoption is expected.

As a matter of contextualization, the rate of adoption as defined by Rogers, which is "the relative speed with which an innovation is adopted by members of a social system" could not be applied in its strictest form here but is being used in this paper to simply refer to adoption or the decision to adopt. The time element involved between the stage of knowledge or gaining awareness of the innovation program and the stage of making a decision to adopt the DOST SETUP has not been covered in this study.

#### *The Relationship Between Innovation Culture and Innovation Adoption*

It was ascertained that innovation culture significantly influences innovation adoption following multiple regression analysis.

One of the seven antecedents of organizational innovation, innovation culture is perceived in this study as one that characterized organizations as responsive to change, experimental with new ideas, and innovative. Based on this finding, it is assumed that popularizing innovation adoption among decision makers can be achieved by strengthening the culture of innovation in the organization.

This researcher has yet to find current studies that measure the same variables that may validate or negate this finding. The closest in the literature are those of Deshpandé, Farley & Webster (1993) and Kitchel (1995) which established that corporate culture is predictive of technology adoption as applied in the field of business marketing. Nonetheless, this evidence quite upheld the existing literature's general view that organizational culture facilitates the formation of mental model for making right decisions (Kennerley & Mason, 2008; Dreher & Tremblay, 2009; Morris, 2011).

Nevertheless, the notion that innovation cultures are made and the building process is expected to originate from organization leaders as constantly purported in the current literature bring both a challenge and an opportunity for change agents to operationalize innovation culture in the day-to-day life of a business organization.

Banking on the prospect that innovation culture can reinforce innovation adoption as revealed in this study, there is a need to steer the mindset of local enterprise leaders into appreciating the value of building an innovative culture in their organizations. Providing them with relevant trainings to ac-

quire innovation competencies formation can be a solution. Innovation competencies refer to knowledge, skills and attitudes needed for the innovation activities to be successful (Penttilä, Kairisto-Mertanen, & Putkonen, 2011).

### Conclusion

This research tried to understand innovation and how it would relate with innovation adoption in a quest for a wider application of an innovation program that intends to boost the productivity and competitive advantage of technology-based enterprises.

Ultimately, if innovation adoption is to be strengthened among small enterprises, capitalizing on innovation culture development at the management level could serve as a viable starting point into that direction. Hence, it is recommended that relevant training designs that may facilitate the development of various managerial competencies that foster the development of innovation culture among technology-based business organizations were recommended.

As an organizational change measure on the part of the government, it is further recommended that innovation competency trainings will be made part of its institutional capacity development program intended for business decision makers in an effort to increase adoption of its innovation program.

The application of innovation pedagogy to instill innovation competencies among students even before they become professionals and future decision makers through the school curriculum across various disciplines is recommended to the academe. The

faculty can also provide innovation capacity trainings and other related activities through the institution's industry support or community extension programs.

For researchers in the field of organizational-social psychology, it is recommended that parallel studies with other industry sectors or types of organization be explored. The validation in a larger scope of the Ateneo-CORD innovation building framework, Rogers' five-stage innovation decision model, and the relationship between the constructs of organizational innovation and innovation adoption produced by this research is recommended for further studies.

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