

Innovation Culture of Selected Agricultural State Universities and Colleges (SUCs) in Regions III and VIII

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This paper extends the concept of innovation culture to higher education institutions (HEIs), particularly in the context of doing research and development (R&D) in agricultural state universities and colleges (SUCs). Through the synthesis of related literature, we learned the different organizational, human, and collaborative dimensions of innovation culture. Using case study research design, 40 R&D managers and administrators, innovators, and faculty-research personnel from selected Levels 3 and 4 agricultural SUCs from Regions III and VIII were involved in a series of in-depth interviews and focus group discussions (FGDs). Institutional statements such as mission, vision, and organizational goals were used as secondary data. Explicitation techniques and content analysis were applied to identify themes and concepts related to innovation, innovation culture, and the challenges in doing R&D in the university. Results revealed that the aspects of innovation and the concept of innovation culture were embedded in the institutional statements, as well as in the values of the participants. It was observed that the participants widely understood and appreciated the concept and attributes of innovation culture in relation to R&D activities in the university. We learned that creativity and flexibility, innovation resources, training and capacity development, and coaching and mentoring were key elements of innovation culture that can help address the managerial and institutional challenges in the university. Lastly, identifying, assessing, and determining the impacts of the specific dimensions and elements of innovation culture on R&D productivity, as well as in producing innovative graduates, were deemed relevant areas for research.

Keywords: agricultural state universities and colleges, innovation culture, research and development productivity

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INTRODUCTION

Innovation culture is described in many ways. For Claver *et al.* (1998), it is described as “the way of thinking and behaving that creates, develops, and establishes values and attitudes within a firm, which – may in turn – raise, accept and support ideas and changes involving an improvement in the functioning and efficiency of the firm, even though such changes may mean a conflict with conventional and traditional behavior.” Several authors have defined innovation culture as a multidimensional context and constructs (Stock *et al.* 2013) and is often regarded as a self-explanatory phenomenon, which can be described by a somewhat universal set of characteristics. Innovation culture is an environment and a culture (Xie *et al.* 2016), which emphasizes participation and drives growth and performance (Tian *et al.* 2018). Innovation culture as a concept is multidimensional (Eynde *et al.* 2015; Jucevicius 2010) and can be understood as a dimension of organizational culture, a way of thinking, innovative attitude, behavior and value system, a technological vision, tradition, and as a process shared by those who are involved in the innovation process (Claver *et al.* 1998; Anderson *et al.* 2012; Alm and Jönsson 2014). These notions and definitions of innovation culture came mostly from management and business organization perspectives.

A range of studies has similar yet overlapping concepts and dimensions of innovation culture. Some were used to characterize an organization, while others described what constitutes an innovative culture. Alm and Jönsson (2014) proposed five dimensions of innovation culture. These are innovation readiness, creativity and learning, leadership and entrepreneurship, market orientation, and motivations and relations. They also identified shared purpose, supportive leadership, willingness to dedicate resources, and an organization-wide customer focus as some of the success factors that influence the culture of innovation in the organization. On the other hand, Roffeei *et al.* (2016, 2018) proposed an innovation culture framework for understanding the university culture, environment, and member’s approaches/actions and the factors that affect students’ innovative behavior. Under the external environment are goals and motivation and internal communication while the internal environment captures the infrastructure, rewards and incentives, nature of work, teamwork, support, and interpersonal relations. Meanwhile, innovative culture is described through the stories, rituals, and language used in the university. These drive innovative behavior such as curiosity, creativity, flexibility, proactiveness, autonomy, empowerment, risk-taking, mistake handling, and novelty seeking. Schertlin (2018) provided other elements to be considered in assessing innovation culture: communication of the intention to innovate; incentives and rewards for

innovative behavior; infrastructure to communicate ideas, knowledge, and problems; consideration of employee interest; room for creativity; flexibility of work; and correct handling of mistakes.

However, there remains the need for a consensus regarding the dimensions of innovation culture (Eynde *et al.* 2015; Jucevicius 2010). Some authors considered innovation culture as a dimension of organizational culture – referring specifically to attitudes towards innovation, technology, knowledge exchange, entrepreneurial activities, and part of the major innovation capabilities (Anderson *et al.* 2012; Alm and Jönsson 2014) and is made up of technological visions, research traditions, value systems, *etc.* shared by those who take part in the innovation process (Jucevicius 2010).

Previous studies explored the role of innovation culture, particularly in organizational innovation outcomes (Jin *et al.* 2018; Dobni 2008) and productivity. The latter emphasized that firms with a strong culture will have a positive and significant impact on performance outcomes. In this model, a culture supporting innovation engages behaviors that would value creativity, risk-taking, freedom, teamwork, be value seeking and solutions-oriented, communicative, instill trust and respect, and be quick on the uptake in making decisions.

In the Philippines, Quimbo and Sulabo (2014) suggest the important role of faculty capacity development program, research collaboration, research culture, and competitive incentive system with R&D productivity in HEIs. R&D outputs such as scholarly articles and publications, knowledge, technologies, product, and inventions are some important indicators of productivity (Roxas-Soriano *et al.* 2020). The HEIs are the main producers of R&D outputs such as scientific publications, patents, as well as business enterprises and employment (Regadio and Tullao 2015). However, R&D activities – particularly in the SUCs – may cause tensions with instruction (*e.g.* teaching engagements), extension (*e.g.* outreach commitments), research, and production of research outputs, which are also confounded by limited and differences in resource allocation, tedious procurement processes and general accounting rules, regulations, and policies (Roxas-Soriano *et al.* 2020). For Orale *et al.* (2019), persistent issues in HEIs in the Philippines include low productivity in R&D due to research prowess and deteriorating science and innovation culture.

In addition, Quitoras and Abuso (2021) also highlighted the role of sustainable culture for research, which underscores the role of academic leaders and research managers in inspiring faculty members toward doing research and publication. Orale *et al.* (2019) presented other factors needed in attaining R&D productivity such

as improved competencies of the faculty in research, upgraded/established research facilities/laboratories, and the amended research policies and priorities. Lastly, the proposed Philippine Innovation Act of 2019 intends to optimize government spending for R&D and innovation activities (NEDA 2019). The law also highlights the role of physical and human capital factors, as well as of institutions in fostering innovation in the country.

Within the higher education context, the concept of innovation culture is yet to be established (Fuad *et al.* 2020); more so, explored how it can promote productivity in terms of delivering the individual tasks and functions related to research, instruction, production, and extension in the SUCs. As such, this study was framed within the perspective of R&D productivity with the belief that innovation depends largely on the quality of local universities, the internationalization of local inventions, and the quality of scientific publications (Cornell University/ INSEAD/ WIPO 2019).

In this study, we described R&D productivity in terms of the production of scientific knowledge and technology such as research articles and other publications and patent registration, utility models, intellectual property (IP), and inventions. Furthermore, we also placed innovation culture as a social-ordering approach to harnessing human (innovative traits and behaviors) and non-human organizational factors (organizational policies, structure, resources, and processes) toward productivity despite numerous challenges and setbacks in doing R&D.

The present paper explores how agricultural SUCs, as a unique type of organization, can hasten R&D productivity despite the environmental and institutional challenges. This particular setup leads to the following research questions: What are the dimensions of innovation culture in the context of selected public HEIs? How can this be further understood in relation to hurdling the challenges and improving R&D productivity in agricultural SUCs?

This paper presents the concept and dimensions of innovation culture within the context of doing R&D in the university. It provides a synthesis of innovation culture frameworks, dimensions, and elements in previous studies, which further situates the current but limited knowledge and application of the concept of innovation culture. It also analyzes the institutional statements (*e.g.* mission and vision statement) of the four selected agricultural SUCs, as well as the narratives of the participants pertaining to their R&D tasks and activities in the university. The study also explains the meanings and roles of innovation culture in relation to doing R&D in the SUCs. Lastly, it presents some of the managerial/leader as well as institutional concerns in doing R&D in the university and explores the attributes as well as the dimensions and elements of

innovation culture that were experienced and shared by the participants.

MATERIALS AND METHODS

The study employs a qualitative research approach to explore the dimensions of innovation culture in the context of public HEIs. According to Denison (1996), qualitative approaches are commonly used when studying culture. Likewise, the use of a qualitative research design is an appropriate approach to describe and determine the purpose of innovation culture in government organizations. In line with an argument by Bryman and Bell (2011), qualitative research is appropriate since the purpose of the research is to understand innovation culture as perceived by individuals. The study employed a case study research design to allow for an “empirical inquiry” of a phenomenon “in-depth and within its real-life context” (Yin 2009). Such design ensures a detailed description of the occurrences, activities, and participants’ views of innovation culture, and the findings provide the material for the discussion of concepts and meanings (Creswell 2014). Moreover, it allows for more flexible methods to answer the main research questions while exploring the dimensions of innovation culture. Consequently, this paper relied on primary qualitative data from the in-depth interviews and series of FGDs conducted from February–March 2019 in four selected agricultural SUCs in Regions III and VIII.

Synthesis of selected literature was done to initially establish the different dimensions of innovation culture. It began with scanning and review of carefully selected studies, which led to the identification of key dimensions of innovation culture. Various descriptions, research instrument contents, and interview and research guide questions from previous studies were extracted, coded, categorized, and synthesized using QDA Miner Lite, a computer-assisted qualitative analysis software. Through this process, the dimensions of innovation culture were synthesized, which led to the formulation of interview and FGD guide questions. The guide questions formulated were reviewed by experts who are specialists in the fields of technology and innovations management, R&D administration and management, formal organizations, and instructional materials development.

The study was conducted in four selected Levels 3 and 4 agricultural SUCs in Regions III and VIII, which are classified by the Commission on Higher Education (CHED) in terms of undertaking instruction, research, and extension – as manifested by teaching effectiveness, research competence, active community service, and efficient management of resources.

This study had 32 FGD participants composed of faculty-research project personnel. Likewise, the in-depth interviews involved eight participants composed of innovators plus R&D managers and administrators. In general, the participants were those who have been in the organization and are involved in the R&D activities for at least five years.

Data from the in-depth interviews and FGDs were transcribed and analyzed to build up themes regarding innovation and innovation culture. Explicitation techniques such as reading and re-reading of transcriptions, listening of the recording, and delineating and clustering of codes were applied to arrive at themes from the participants' descriptions and insights on the specific elements and subdimensions of innovation culture, as well as their experiences in the R&D programs and activities in the organization. Such a technique allows for studying the meanings and roles of innovation and innovation culture while keeping the whole in the context (al Hashlamoun and Daouk 2019) of doing R&D in the agricultural SUCs. The initial categories were subjected to thematic analysis by examining similarities and relationships among them. Content analyses of the institutional statements and narratives of the participants of the study led to the understanding of the organizational culture as well as the nature of research endeavors of each organization. Likewise, content analysis of the institutional statements such as philosophy, vision, mission, organizational goal statements were extracted, coded, categorized, and synthesized using the same computer-assisted qualitative analysis software.

RESULTS AND DISCUSSION

A Synthesis of Existing Innovation Culture Frameworks, Dimensions, and Elements

The different dimensions and elements of innovation culture from previous studies, which are mostly from management and business organization perspectives, were unpacked and synthesized. The process began with scanning and review of carefully selected previous studies, which led to the identification of key dimensions and elements of innovation culture and performance indicators. The study only considered previous local and international researches that 1) have been done in the last 10 years; 2) present key dimensions, themes, and subthemes of what constitutes innovation culture at a national and organizational context; 3) present methods and/or tools to measure innovation culture; and 4) relate innovation culture to innovation performance. This was followed by a synthesis of the dimensions of an innovation culture and performance indices presented and

used by previous research. These dimensions were then coded, categorized, and extracted from selected research publications using computer-assisted qualitative analysis software.

Based on this initial analysis, three main dimensions of innovation culture were identified. These are 1) organizational, 2) human and behavioral, and 3) network and partnership. The organizational dimension is composed of organizational climate, design, values, communication systems, conflict management, processes, and rewards and incentives that promote an innovation-conducive organizational culture. The human and behavioral dimensions, on the other hand, present the innovative traits of individuals, teams, groups, and leaders that make up an organization. Lastly, the network and partnership dimension of innovation culture typifies the collaboration and market and customer orientation activities of an innovative organization. The elements and characteristics were clustered accordingly to each sub-dimension (Appendix Table I).

Also, the synthesis of literature pointed out the need to identify how innovation culture values and practices influence the economic performance of the organization and how it affects the performance of organizations in other cultural contexts (Anderson *et al.* 2012; Alm and Jönsson 2014). From the models and frameworks of innovation culture presented above, it can be observed that the concept applies well in the context of private and manufacturing organizations and suggests the need for further investigation in different organizational contexts. This includes the validation analysis of the elements of innovation culture that were measured and characterizing the implications to innovation processes and outputs of the organizations. A common recommendation of these authors focuses on the need for context-based approaches to understanding other dimensions of innovation culture in different organizations. The study placed these dimensions of innovation culture in the context of the selected agricultural SUCs in relation to the conduct R&D. It also probed on the institutional statements, as well as the narratives, of the participants of the study to further understand what innovation culture is in the context of doing R&D in agricultural SUCs.

Aspects of Innovation in the Agricultural SUCs

The role of HEIs in keeping the research-extension continuum dynamic to ensure that R&D results will be able to help in national development through effective technology transfer is widely recognized. As such, faculty members of any HEI are expected to deliver outputs in research, extension, production, and instruction. These expectations are embedded in the institutional statements of HEIs, which also depict the current indicators of as well

as the standards for productivity, promotions, and ranking systems set by CHED for faculty members in SUCs.

Institutional statements such as the vision, mission, and philosophy form the foundation of objectives and strategies of an organization, which determine a culture that is favorable to its cause (Rajasekar 2013). On the other hand, a cultural perspective on institutional statements encompasses the philosophy, identity, and values that give meaning to the goals, norms, decisions, actions, and everyday behavior of members of the organization (Babnik *et al.* 2014).

We characterized the organizational culture specific for doing R&D in the HEIs by analyzing their institutional statements (*e.g.* vision, mission, and philosophy). Likewise, the narratives of the research participants' views of innovation were also analyzed. Furthermore, the interpretation of the themes reflected the six aspects of innovation proposed by Ahmed and Shepherd (2010), as cited by Szlapka *et al.* (2017).

Innovation as creation. According to Ahmed and Shepherd (2010), the first aspect of innovation is "creation," which highlights the use of resources such as people, time, and money to invent or develop a new product, service, way of doing things, or way of thinking about things. Examples lifted from institutional statements of the four HEIs were "market-driven innovations," "development and promote technologies," "quality and excellent services," and "scientific and innovative technology," which were interpreted as innovation as 1) a product or service and 2) technological advancement (Appendix Table II). Likewise, the views of the participants regarding the creation aspect of innovation revealed similar themes when asked about the concept of innovation and its role in doing research in the university. The following are some of the responses of the participants:

"Innovation is about technology development; value-adding are things that come to our minds about innovation." (FGD note, HEI1)

"There's commercial value, an invention with a market or creation with income. Something that will improve [the life of] an individual." (key informant 1, HEI3)

"Unique, patentable application, new technology, modern, new concept, improved version, discovery, R&D program, something new, new methods." (key informant 1, HEI2)

Innovation as an event. The "event" aspect of innovation focuses on occurrences such as acquiring, supporting, using, or adopting a product, service, or idea (Ahmed and Shepherd 2010). An example of this aspect of innovation includes "partnership with key sectors of development" and "expand their intellectual horizons," which pertain to

occurrences of collaboration and widening of knowledge and competencies (Appendix Table III). Similarly, some participants also reflected the themes developed under this aspect of innovation. Here are some of their responses:

"You need to make friends and collaborate. We include/involve others in the research proposal especially when they have the needed resources and equipment." (key informant 1, HEI3)

"...we continue to build expertise and being up-to-date, we build more people in the fields of nanotechnology, smart agriculture, data analytics. We collaborate with other universities for expertise." (key informant 1, HEI1)

"Linkaging is highly important because we believe no man is an island. We have our strength, we have our weakness and if we have the network then that could help us, that could complement with the strength that we have." (key informant 2, HEI1)

Innovation as diffusion and learning. The "diffusion and learning" aspect of innovation pertains to discrete and distinct events, such as the development of a single product, service, idea, or decision for a specific purpose or agenda (Ahmed and Shepherd 2010). Examples of this aspect that were obtained from the institutional statements include "appropriate approaches for sustainable agro-industrial development" and "quality education and professional training" (Appendix Table IV). This aspect of innovation was also manifested in the following responses of the participants, specifically on the purpose of quality education and professional learning among the students and faculty members of the university:

"We continue to allow them to go on study leave for their graduate program. Mostly PhDs." (key informant 1, HEI1)

"We have a lot of catching up to do in that area and the thing that we did first was to raise again the awareness, and then capability building, although we already have an incentive and award system in place." (key informant 1, HEI4)

Innovation as radical or incremental change. The "radical or incremental change" aspect of innovation describes innovations as minor adjustments or discontinuous in nature (Ahmed and Shepherd 2010). This aspect also highlights that radical or incremental change is deemed necessary in realizing a goal or serving a cause. Phrases lifted from the institutional statements that relate to this aspect were categorized "as shift having output-based and realistic policies, goals, and strategies," "a shift to human resources development," "a shift to promoting positive values in the professional and advanced technological fields" (Appendix Table V). Under this aspect of

innovation, the participants agreed that innovation needs a shift to not only developing technologies and services but also to producing quality graduates (human resources), as well as continuous improvement in research-related policies in the university. The following are some of their responses:

“Improvements of products, processes. The product that we mean here not only the products based on materials, but we are referring also to the kind of ‘products’ that they are after graduation.” (FGD note, HE14)

“It’s only a simple technology of changing hatchery management to increase production. We thought it simple yet made a huge impact in the industry.” (key informant 2, HE11)

“There were some amendments made in the research manual. Every time we encounter problems, we make sure changes and/or clarifications are reflected in the policies.” (key informant 1, HE12)

Innovation as a process. The “process” aspect of innovation highlights firm-level series of activities that are carried out to produce an outcome (Ahmed and Shepherd 2010). It also highlights the organization-specific approach to innovation. Phrases from the institutional statements depicted this aspect of innovation, which were further categorized into 1) an integrated process of human resources, knowledge, and technology development and 2) innovation as a path toward sustainable development (Appendix Table VI). In addition, the following insights shared by the participants were deemed aligned with the view that innovation is an integrated process of developing human and other resources of the organization:

“We try to capitalize on our strengths and likewise improve on the weaknesses.” (FGD note, HE13)

“Better innovation, better policy observation, better products to do. Innovativeness is validated through the graduates, quality of research paper, and number of inventions.” (FGD note, HE14)

Innovation as a context. The “context” aspect focuses on institutional frameworks and socio-political networks as important factors in the act of innovation, which are beyond the confines of an organization (Ahmed and Shepherd 2010). Some key phrases present innovation as a goal for achieving excellence and relevance and, at the same time, an imperative in a changing and dynamic context. These phrases include institutional statements such as “address ever-changing educational needs and services” and “globally competitive, work-ready, socially responsible” (Appendix Table VII). Meanwhile, participants shared that innovation in the organization is imperative, which means that innovation is essential

in a diverse R&D culture and direction, as well as in a continuously growing intellectual R&D horizons and expertise.

“One must have a clear picture of the culture for R&D and its direction. Diversity in the organization is needed.” (FGD note, HE12)

“Good mentoring entails openness to new things such as advanced frontier science like nanotechnology, biotechnology, data science, and then – of course – in SMART farming. A mentor must have a wide intellectual horizon to be an effective one.” (key informant 1, HE11)

Based on the institutional statements of the four agricultural SUCs, innovation in their organization is viewed as “a shift to output-based and realistic policies” and “human resource development” (change); “a product or service for a specific group of people or sector” (diffusion and learning); “a process of technology and information generation, human resource development, communication, and partnership” (process); and as “development of a product or service” (creation). As such, innovation can be thought of as an output, product, or service (*e.g.* creation), a process (*e.g.* diffusion, change, or event), and a system made of up institutions and actors affected both by internal and external factors (*e.g.* context). Innovation as a product or output, service, process, and system constitutes the common views and concepts presented in the extant literature, especially in those referenced for this study. This study agrees with that of Szłapka *et al.* (2017) in saying that understanding the aspects of innovation in an organization is imperative since the concept itself is wide.

Furthermore, the narratives of the participants confirmed that innovation is embedded already in the organization. In the following statements, innovation is important in public HEIs as it serves three purposes: 1) as a core function of the university and of the faculty members that can help them carry out their research, extension, and instruction tasks; 2) a priority for its importance in keeping the organization on track; and 3) an agenda/ goal of the organization:

“...it is one of the four core functions, we needed to come up with research and all but it all boils down at the end of the day for every researcher.” (FGD note, HE14)

“Yes. [It is] in our vision, to be a globally competitive university, which technology innovation is being given priority.” (key informant 1, HE13)

“Innovation is important in keeping our R&D activities grounded (on the vision mission) of the university...” (FGD note, HE11)

“Innovation in research, which is the R&D agenda, we first align it with the thrust of the organization. We revise and update it according to the changes in the agenda of government line agencies.” (key informant 1, HEI2)

As such, we can now say that institutional statements such as the vision and mission statements of the university can help explain how innovation in the context of doing R&D is being valued and pushed in the organization. Moreover, the aspects of innovations that were manifested from the institutional statements of the four agricultural SUCs can help us describe the organizational culture for innovation, as well as the work behavior espoused by the participants regarding R&D in the SUCs. Lastly, the narratives of the participants also suggest the important role of the different aspects of innovation, especially in the R&D activities of their organization.

Innovation Culture: Attributes and Building Blocks

The study also elicited two meaningful themes regarding participants' cognition of innovation culture in their organization, particularly in doing R&D (Appendix Table VIII). Under the first theme, attributes of innovation culture include the concepts of collectivity, relevance and competitiveness, and sustainability. According to the participants, innovation culture helps promote collectivization and bring people together by promoting a sense of community and a common sense of purpose aligned with the thrust of the organization. Innovation culture not only helps the organization develop new products and technologies but is also instrumental in sustaining its success and achievements and accomplishments by promoting competitiveness and relevance in terms of producing new and better-quality products and services, and promoting competitiveness, productivity, and performance among the individuals in the organization. Under the theme building blocks of innovation culture in the organization, there remained the components of innovation – the people, products, and the processes. This theme can also help explain the perceived strength of innovation culture in their organization. According to the participants of the study, an organization with a culture for innovation can be observed through its people, products, and process. Likewise, innovation culture should be also institutionalized in the organization, which means it should be explicitly stated in the mandates, as well as the vision and mission statements of the organization. Lastly, innovation culture is also manifested by a “nurturing and listening” climate in the organization.

This study also extends our understanding of the concept and dimensions of innovation culture in the context of agricultural SUCs. In addition to the elements of innovation culture synthesized and presented in this

paper earlier, this study described seemingly important attributes of innovation culture such as having a sense of community and purpose and valuing competitiveness and relevance. These attributes further described the “organizational innovation atmosphere,” which was espoused by Dobni (2008) as one of the multi-dimensional organizational innovation cultures. Likewise, the people, products, outcomes, policies, and processes as building blocks for innovation put in context the organizational, human, and behavioral dimensions of innovation culture in public organizations, with great emphasis on explicit institutional innovation statements and plans that can influence performance and productivity among members of the organization. Lastly, this study highlights that, as an aspect of organizational culture, innovation culture also has many layers such as values, norms, beliefs, and basic assumptions that shape the firm's intention for innovation.

Role of Innovation Culture: Toward Improved Productivity

The study earlier highlights the layers of organizational culture such as values, norms, beliefs, and basic assumptions, which shape the firm's intention for innovation. Furthermore, applying innovation culture in the context of academic organizations such as agricultural SUCs, this study also highlights that the dimensions of innovation culture must be shared among members of the organization to overcome the challenges in doing research.

The analyses of the issues and problems concerning the conduct of R&D surfaced two important themes where policy interventions can emanate (Appendix Table IX). The first theme focuses on the managerial and/or leader concerns, which when addressed can help respond to the present issues and concerns in the conduct of research in the organization. Under this theme, issues and concerns include delays in the implementation of research projects due to the tedious process of government procurement (e.g. public bidding mode); traditional mindset of the faculty regarding their core tasks and functions in the university that limits their drive and motivation to engage more in doing research; poor appreciation of the research-extension continuum (which limits the generation of innovative and collaborative ideas and projects that promote synergy and complementation of expertise and resources for both areas); lack of essential skills/capacities to plan, develop, and implement research initiatives that further limit faculty motivation to get involved in research activities in the university; and issues pertaining to the appraisal of individual performances in the area research (which participants believed one of the reasons that limit motivation and drive of the faculty). The second theme pertains to institutional environment concerns, which limit the actions and motivations of the faculty in conducting research. Issues and concerns under this

theme include the lack of resources (*e.g.* innovation units/experts, infrastructure) devoted to research and innovation activities of the organization, clear policies as well as indicators for research and innovation activities and accomplishments of faculty members, and flexibility and creativity to mitigate the implications of tedious processes involved in public procurement. Likewise, the complexity of the issues and concerns shared by the participants were overlapping; for instance, issues regarding the procurement process and lack of resources called for managerial/leader and institutional environment concerns.

A collective description of each theme is presented in Appendix Table X. In general, both themes greatly affect the drive and motivation of the university faculty members in engaging and doing research in addition to workloads in teaching and instruction. The theme managerial/leader concerns described the need to change the mindset of the individual faculty members to embrace research functions of the university, as well as the necessary faculty encouragements and motivation by managers and leaders through mentoring and coaching to lessen and mitigate individual and institutional burdens affecting research initiatives and activities in the organization and to foster the generation of innovative ideas and interactions among units and individuals in the organization. The institutional concerns theme pertains to the need to address, as an organization, the issues on workload, relevant performance assessment for R&D, weak research culture or mindset among the individuals, limited resources for research and innovation, and mainstreaming training and capability building for research.

The higher education commission is implementing the guidelines to incentivize productivity by setting performance indicators of – as well as the standards for – promotions and ranking systems for faculty members in SUCs. However, setting a performance measurement system is often detrimental to organizations and, thus, needs to be constantly adjusted by engaging employees to share their own ideas (Stempfle 2011). Doing so empowers the employee to think they are contributing to the organization. For Soken and Kim Barnes (2014), what gets measured is typically what gets done. Thus, performance management should include a balance appraisal of outputs and activities concerning the research, instruction, extension, and production functions of the university and of the faculty. Moreover, Chiesa *et al.* (2009) suggested that performance measurement in R&D is used to exert control over activities and support critical management decisions, thus spelling the efficiency and effectiveness of the organization. It is also used as a means to improve the motivation of researchers. For instance, policies and guidelines such as the strategic performance management system, performance-based

bonus, and national budget circular for promotion of faculty encourage them to engage in research to gain higher points.

On the other hand, Torrentira (2018) suggested that in promoting research culture among faculty members, consideration must be given to motivation and incentive and developing the institution's endowment of research skills through recruitment and/or education and training. Another concern was on strengthening the complementation of research and extension, hence the need to rethink current performance management systems in the public HEIs capturing not only the corresponding performance indicators and balanced workloads, as well as the SUC leveling. Other means may include the dimensions of promoting innovativeness of the individuals and teams involved in R&D in the university.

With reference to social ordering (*e.g.* toward improving R&D performance) espoused by the actor-network theory, non-human factors such as institutional statements must help advocate, prescribe, and shape the innovative behavior and the culture for innovation in the public HEIs like the agricultural SUCs. Hence, it is vital to make these dimensions more explicit in the institutional policies such as the mission, vision, goal, and philosophy statement of each organization.

The participants also expressed that skills and competencies are essential in performing their research, extension, production, and instruction tasks, which relate to the role of continuous improvement and learning organization aspects of innovation culture. The participants also considered these as motivation to engage in R&D. To this, Torrentira (2018) emphasized that continuous training team, technical assistance, provision of guidance, support, and direction are some of the key components of sustainable research collaborations between the university and the industry and government agencies. In addition, Quimbo and Sulabo (2014) suggest that universities must have a viable and strong faculty and staff development program – specifically, the capability of the faculty should be enhanced to prepare proposals and conduct researches through the provision of appropriate training programs.

In addition to issues on workload and tedious procurement processes and accounting rules and regulations, another common challenge faced by R&D personnel includes the need to strengthen and/or reinforce the resources that are essential in innovations management activities such as R&D proposal packaging, IP protection, and technology transfer and commercialization. According to them, such difficulties necessitate not only creativity and flexibility in tasks management but also orientation to technological innovation and more explicit innovation processes. This highlights the importance of flexibility and

creativity. Creativity requires a conducive environment (Roffeei *et al.* 2016, 2018; Blom and Hertzberg 2018) and institutions that are flexible to adapt to changes and re-adjust relevant rules, regulations, norms, and beliefs. Moreover, for Martins and Terblanche (2003), creativity in an organization can only be determined if the vision and mission statements mention creativity and innovation.

Lessons and insights of participants regarding the challenges and difficulties they experienced in the organization were drawn from this study. The first is promoting creativity in the performance management system for research and extension. Performance management should include the balanced appraisal of outputs and activities concerning the research, instruction, extension, and production functions of the university and of the faculty. Moreover, Chiesa *et al.* (2009) also suggested that performance measurement in R&D is used to exert control over activities and support critical management decisions, thus spelling the efficiency and effectiveness of the organization. It is also used as a means to improve the motivation of researchers. For instance, policies and guidelines such as the strategic performance management system, performance-based bonus, and national budget circular for promotion of faculty encourage them to engage in research to gain higher points. Also, Orale *et al.* (2019) highlighted the important policies to ensure improved performance in R&D.

The second is providing more flexible resources for R&D and innovation activities to lessen the impacts of procurement delays. Quimbo and Sulabo (2014) and Gamusa and Pacolor (2019) also highlighted the need to increase/realign funds allocated for research to minimize the impeding factors to research productivity, which is also essential in reducing resistance to changes in the organization and in building research culture in the organization.

Third, the need for responsive training and capability development for research and innovation. Continuous training team; technical assistance; provision of guidance, support, and direction (Torrentira 2018); a balanced mix of attitude towards work and competence; and continuous capability building on key areas (specialized doctorate, masters' and short-term training/industry experience/immersion) and more international exposure of the faculty are key to attaining sustainable research collaborations between the university and the industry and government agencies (Gamusa and Pacolor 2019).

Fourth is promoting flexibility in tasks management. Common challenges faced by R&D personnel include delays in the implementation of projects due to tedious procurement processes and general accounting rules and regulations, lack of important resources, and heavy

workload. While these issues are greatly policy and guideline related, they are also deemed a managerial/leader concern. Thus, with these limitations, flexibility is essential. Flexibility means to continually adapt to change and to readily commit and redirect resources for innovative opportunities, while creativity means being resourceful in the methods of operations and sharing of new ideas in the organization. The flexibility of work and informality at both organizational hierarchies support the dynamic exchanges of knowledge and ideas within and outside the organizations (Petraite and Ceicyte 2012).

Lastly, staff coaching and mentoring by leaders and managers. Coaching and mentoring can inspire and empower employees, promote commitment, increase productivity, grow talent, and encourage success (Serrat 2010). As a dimension of transformational leadership, coaching and encouragement from leaders are necessary to get the group working (Jong and van Lind Wijngaarden 1999). Coaching also benefits the leaders and managers as it provides them the opportunity to reflect on their own values, beliefs, and behavioral patterns (Stempfle 2011). Mentoring helps build an inclusive work environment since it fosters good relationships beyond the ranks and hierarchies, promotes trust, and encourages mutual learning (Pless and Maak 2004). Faculty members are not doing research due to a lack of confidence in their research skills. According to Salazar-Clemeña and Almonte-Acosta (2007), appropriate policies are needed to reach out to the novice faculty in order for them to be involved in research. Mentoring is seen as essential for faculty involvement. Orale *et al.* (2019) suggest that implementers of the policy must also serve as good followers, leaders, and an inspiration/example to their subordinates. Lastly, such insight relates with Gomba and Pacolor (2014) suggesting that leadership skills of the R&D managers and support from the management will aid in setting the direction and implementation of R&D programs, policies, and capability building among faculty and staff.

CONCLUSION

Innovation provides any organization with a competitive advantage in developing new products, technologies processes, and services. This holds true for doing and keeping R&D productivity in the context of agricultural SUCs, particularly in Regions III and VIII. An explicit innovation culture can help motivate employees, stimulate innovative behavior, and promote commitment to innovation among the members of an organization. Not only did it extend our understanding of innovation culture in the context of both private and public organizations, but this study also put the relevance of innovation culture

in agricultural SUCs particularly in promoting R&D productivity among faculty-researchers.

Through the synthesis of previous studies, we learned the organizational, human, and collaborative dimensions and elements of innovation culture. These dimensions reflect the layers of organizational culture such as values, norms, beliefs, and basic assumptions, which shapes the innovativeness of the organization. Likewise, we also extend the general concept of innovation culture in academic organizations like the agricultural SUCs. From this study, we understood the importance of innovation culture in hurdling the challenges and issues regarding staff workload on research, instruction, production, and extension tasks and activities – as well as the tedious procurement processes and accounting rules and regulations that can hinder R&D productivity, particularly in the agricultural SUCs.

This study highlights the importance of understanding the aspects of innovation in an organization since the concept of innovation itself is wide. We can say that innovation and innovation culture are both implicitly and explicitly embedded in the institutional statements of the agricultural SUCs studied, as well as in the values that the participants attached to it in relation to doing R&D. Hence, it is important to make intention for innovation more explicit as this can determine how the individuals should promote and value in the organization.

We also synthesized the different human and non-human dimensions of innovation culture and further learned its multidimensionality. In the context of agricultural SUCs, the study revealed that innovation culture is a widely understood concept in terms of its attributes and building blocks. Likewise, we realized the importance of innovation culture as it was widely recognized by the participants in terms of their activities and outputs related to doing R&D in the organization.

The managerial and institutional concerns can greatly affect the drive and motivation to engage and conduct R&D activities in addition to teaching and instruction tasks in the university. Consequently, extending the concept of innovation culture in the academe – particularly in terms of doing R&D – we learned that having creativity and flexibility, innovation resources, training and capacity development, and coaching and mentoring were the key elements or building blocks manifested in the narratives of the participants, primarily in addressing the managerial and institutional challenges in the organization. Lastly, this study is limited in terms of using specific models to determine the level of R&D productivity in agricultural SUCs. Hence, research areas to consider may include relating the different dimensions and elements of innovation culture in academic institutions as a social-

ordering approach toward improved R&D productivity. It is also noteworthy to consider exploring how leaders and managers help in forming innovation culture in public HEIs. Likewise, it is imperative to know how such a culture influences academic organizations in producing quality and innovative graduates.

STATEMENT ON CONFLICT OF INTEREST

Dr. Paul Jersey G. Leron and Dr. Rowena DT. Bacongus declare that they have no conflict of interest in this research and in this publication. The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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NOTES ON APPENDICES

The complete appendices section of the study is accessible at <http://philjournsci.dost.gov.ph>

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Table I. Synthesis of the dimensions, subdimensions, elements, and characteristics of innovation culture.

Organizational dimension	Elements	Characteristics	Authors
Climate	Entrepreneurial	Highly entrepreneurial activities; entrepreneurship	Alm and Jönsson (2014); Dobni (2008)
	Inclusivity	Consideration of employees' interest	Schertlin (2018)
	Intention for innovation	Innovation readiness; organizational mindset for innovation; the intention to be innovative; innovative mission and vision statements; organizational strategy, values, and consistency; product and program innovativeness; innovation-oriented organizational culture, norm, and artifacts; shared purpose	Alm and Jönsson (2014); Dobni (2008); Dombrowski <i>et al.</i> (2007); Petraite and Ceicyte (2012); Schertlin (2018); Stock <i>et al.</i> (2013)
	Participation	Joint-problem solving; participation by all employees; involvement; participative decision-making	Alm and Jönsson (2014); Dobni (2008); Davies and Buisine (2018)
Risk-taking	Risk-taking	Willingness to take risks	Dombrowski <i>et al.</i> (2007)
	Communication system	Democratic communication; communication of the intention to innovate; infrastructure to communicate ideas, knowledge, and problems; organizational communication	Alm and Jönsson (2014); Dombrowski <i>et al.</i> (2007); Schertlin (2018); Sadegh Sharifirad and Ataei (2012)
Conflict management	Conflict management	Management is interested in issues of its employees	Dombrowski <i>et al.</i> (2007)
Design	Structure and context	Organizational structure; size; organizational context conducive to innovation;	Petraite and Ceicyte (2012); Rao and Weintraub (2013)
Processes	Innovative processes	Inner work life; information acquisition and interpretation	Alm and Jönsson (2014); Lažnjak (2011)
	Execution	An environment or context to support implementation; flexibility of work; adaptability	Dombrowski <i>et al.</i> (2007); Abdul Halim <i>et al.</i> (2015); Rao and Weintraub (2013); Schertlin (2018); Stock <i>et al.</i> (2013)
Resources	Tangible	Money; infrastructure for innovation; infrastructure to support innovation thrusts; resources for innovation; willingness to dedicate resources; safe spaces	Alm and Jönsson (2014); Abdul Halim <i>et al.</i> (2015); Dobni (2008); Rao and Weintraub (2013); Dombrowski <i>et al.</i> (2007)
	Intangible	Dedicated/flexible time for innovation; access to external competence	Alm and Jönsson (2014)
Rewards and incentives	Rewards and incentives	Incentives; incentives and rewards for innovative behavior	Dombrowski <i>et al.</i> (2007); Schertlin (2018)
Values	Creativity and focus	Creativity; room for creativity; single organizational goal	Alm and Jönsson (2014); Dombrowski <i>et al.</i> (2007); Schertlin (2018)
	Learning organization	Mindset for learning; learning orientation; management is interested in ideas of its employees; correct handling of mistakes;	Alm and Jönsson (2014); Brettel and Cleven (2011); Dombrowski <i>et al.</i> (2007); Linke and Ansgar (2011); Schertlin (2018); Sadegh Sharifirad and Ataei (2012)

Organizational dimension	Elements	Characteristics	Authors
	Orientation to technological innovation	Orientation towards technological innovation; technological turbulence Innovation-oriented organizational culture	Brettel and Cleven (2011); Davies and Buisine (2018); Stock <i>et al.</i> (2013)
Human and behavioral dimension			
Individuals	Growth	Mindset for learning; self-determination; presence of innovative individuals	Alm and Jönsson (2014); Rao and Weintraub (2013)
	Intrapreneurial	Intrapreneurship; every employee has innovative responsibility; adaptability	Dobni (2008); Dombrowski <i>et al.</i> (2007); Stock <i>et al.</i> (2013)
	Open-mindedness	Low resistance to change; open-mindedness and questioning of protocol and procedures; influence or the knowledge and orientation of employees to support thoughts and actions necessary for innovation	Aksoy (2017); Dombrowski <i>et al.</i> (2007); Lažnjak (2011)
Leaders and managers	Innovative leaders and managers	Presence of innovative leaders and managers; managers and leaders supportive of innovation	Davies and Buisine (2018); Dobni (2008); Dombrowski <i>et al.</i> (2007); Abdul Halim <i>et al.</i> (2015); Schertlin (2018)
Teams	Innovative teams	Presence of innovative teams; teams or units with resources and facilitation; accountability, relation, and motivation	Dombrowski <i>et al.</i> (2007); Rao and Weintraub (2013); Brettel and Cleven (2011); Alm and Jönsson (2014)
Network and partnership dimension			
Collaboration	External links	Collaboration; boundary spanning; engagement; multiple and easy links with outside of the organization	Aksoy (2017); Alm and Jonsson (2014); Brettel and Cleven (2011)
Customer orientation	Customer understanding	Organization-wide customer focus; customer understanding	Davies and Buisine (2018); Dobni (2008); Petraite and Ceicyte (2012)
Market orientation	Market and environment understanding	Orientation towards future markets; market orientation; understanding the environment	Dombrowski <i>et al.</i> (2007); Petraite and Ceicyte (2012)

Table II. Creation aspect of innovation in the institutional statements of the four HEIs.

Meaning units	Categories	Themes
<ul style="list-style-type: none"> Market-driven innovations 	1. Innovation as a product or service with market relevance	Innovation as market-oriented (1)
<ul style="list-style-type: none"> Develop and promote technologies 	2. Innovation as a development of a product or service	Innovation as product or services (2, 3)
<ul style="list-style-type: none"> Quality and excellent services 	3. Innovation as a service or product	
<ul style="list-style-type: none"> Advancing scientific and innovative technology 	4. Innovation as a technological advancement	Innovation as form of advancement (4)

Table III. Event aspect of innovation in the institutional statements of the four HEIs.

Meaning units	Categories	Themes
<ul style="list-style-type: none"> Partnership with key sectors of development 	1. Innovation as an act of collaborative efforts	Collaboration (1)
<ul style="list-style-type: none"> Expand their intellectual horizons 	2. Innovation as harnessing intellectual horizons	Widening of knowledge and competencies (2)

Table IV. Diffusion and learning aspects of innovation in the institutional statements of the four HEIs.w

Meaning units	Categories	Themes
<ul style="list-style-type: none"> Products and services in agriculture and allied fields 	1. Innovation as a product or service for a specific group of people or sector	Appropriate products and approaches for sustainable agro-industrial development (1, 2)
<ul style="list-style-type: none"> Appropriate approaches 	2. Innovation as a product or service for a specific group of people or sector	
<ul style="list-style-type: none"> Using appropriate approaches for sustainable agro-industrial development to improve the quality of life of the peoples it serves 	3. Innovation as a specific series of processes for better quality of life	Quality education and professional training (3, 4)
<ul style="list-style-type: none"> Providing quality education and professional training in selected areas of specialization through instruction, research, extension services, and production 	4. Innovation as a specific or unique process toward personal growth	

Table V. Change (radical and incremental) aspect of innovation in the institutional statements of the four HEIs.

Meaning units	Categories	Themes
<ul style="list-style-type: none"> Implementation of output-based and realistic policies 	1. Innovation as a shift to output-based and realistic policies	A shift to having output-based, relevant, excellent, and realistic policies, goals, and strategies (1, 2, 8)
<ul style="list-style-type: none"> Execution of development strategies 	2. Innovation as a development strategy	
<ul style="list-style-type: none"> Life-long learning 	3. Innovation as a value	
<ul style="list-style-type: none"> Emphasizing the development of human resources and necessary input to production and growth 	4. Innovation as an investment in human resource development	A shift to human resource development (4, 5, 7)
<ul style="list-style-type: none"> Providing the human resources for industrial agri-business enterprises as well as for the small, medium, and large-scale industries 	5. Innovation as a shift to human resource development	
<ul style="list-style-type: none"> Positive values in the professional and advanced technological fields 	6. Innovation as a value	A shift to promoting positive values (3, 6)
<ul style="list-style-type: none"> Spearheading sustainable community extension programs and projects 	7. Innovation as a community advancement	
<ul style="list-style-type: none"> Excellent and relevant R&D 	8. Innovation as a goal for achieving excellence and relevance in R&D	

Table VI. Process aspect of innovation in the institutional statements of the four HEIs.

Meaning units	Categories	Themes
<ul style="list-style-type: none"> Development of a highly competitive human resource, cutting-edge scientific knowledge, and innovative technologies 	1. Innovation as an integrated process of developing human resources and knowledge and technologies	An integrated process of human resources, knowledge, and technology development (1, 2, 3)
<ul style="list-style-type: none"> People empowerment 	2. Innovation as a process of people empowerment	
<ul style="list-style-type: none"> Technology and information generation and commercialization, integrated capability building, communication advocacy on market-driven innovations, and partnership with key sectors of development 	3. Innovation as a process of technology and information generation, human resource development, communication, and partnership	Innovation as a path toward sustainable development (4)
<ul style="list-style-type: none"> Generation of knowledge and technologies for sustained growth and global competitiveness 	4. Innovation as a process toward sustainable development	

Table VII. Context aspect of innovation in the institutional statements of the four HEIs.

Meaning units	Categories	Themes
<ul style="list-style-type: none"> Address ever-changing educational needs and services 	1. Innovation in a changing, dynamic context	Innovation as a goal (1, 2)
<ul style="list-style-type: none"> Develop globally competitive, work-ready, socially responsible, and empowered human resources 	2. Innovation in a changing, dynamic context	

Table VIII. Meanings, manifestations, and dimensions of “innovation culture.”

Condensed meaning units	Code	Category	Themes
<ul style="list-style-type: none"> An organization with a sense of community for innovation 	Sense of community	Collectivity	Attributes
<ul style="list-style-type: none"> Innovation is helping change the system (improve) 	Sense of purpose		
<ul style="list-style-type: none"> Innovation culture means being relevant and new 	Being relevant and new	Relevance and competitiveness	Attributes
<ul style="list-style-type: none"> Innovation culture helps organization keep up with others 	Catching up	Competitiveness	
<ul style="list-style-type: none"> Innovation culture as key to sustain success 	Sustain success	Sustainability	Attributes
<ul style="list-style-type: none"> Innovative organization promotes creativity 	Creativity and avenue for creativity		
<ul style="list-style-type: none"> Innovative organization works as a family. 	Relationships	People and process	Attributes
<ul style="list-style-type: none"> Innovation culture is a nurturing culture for both young and old. 	Relationships		
<ul style="list-style-type: none"> Innovation culture is a culture listening to the problems of the communities. 	Nurturing and listening; mindset to innovate		Attributes
<ul style="list-style-type: none"> Innovative organization involves the stakeholders in improving present technology 	market and customer orientation		
<ul style="list-style-type: none"> Delegation of right people to the tasks accompanied by work de-loading measures 	Tasking and backstopping	Process	Attributes
<ul style="list-style-type: none"> Innovation culture as connecting the individuals and the organization toward R&D and innovation 	Individuals		
<ul style="list-style-type: none"> Innovation culture influences productivity of the organization 	Performance and productivity	Products	Attributes
<ul style="list-style-type: none"> Innovation culture will help improve organizational performance 	Performance and productivity	Products and outcome	
<ul style="list-style-type: none"> Innovation is institutionalized in the organization 	Institutionalized, mandate	Policies and processes	Attributes
<ul style="list-style-type: none"> Innovation is embedded in the vision, mission, and goals of the organization 	Institutionalized, reflected in institutional statements	Policies	
<ul style="list-style-type: none"> Innovation culture as a manifestation of innovative organization 	People, process, and products	People and process; products	Attributes
<ul style="list-style-type: none"> Innovation culture as embedded in the institutional statements, plans, and policies 	Process		

Table IX. Problems and concerns relating to R&D activities in the agricultural SUCs.

Condensed meaning units	Code	Category	Theme
The problem felt by other groups is the procurement system, which caused delays in the implementation of research projects.	Need to address problems on procurement process	Being creative in bureaucratic processes	Managerial/ leader concerns
There is an old thinking that they are already well-compensated hence, lessens the motivation and drive for faculty to do research over and above their teaching functions.	Need to change old thinking to boost the drive and motivation for conducting research	Changing mindset	
The problem is on how policies were interpreted as they are, which limits creativity for doing research in the organization.	Need to think outside of the box	Changing mindset	
A common mindset that people who do well will end up being bombarded with additional tasks.	Need to involve every individual in the research tasks and activities	Changing mindset	
They ask if they propose a study. It should be otherwise, a long-term and continuous one. You have to see the outcome. Why not focus on their specialization? Innovative individuals should think big and explore researchable areas in the field.	The need to encourage people to think big and explore researchable areas	Changing mindset; encouraging staff	
Encourage more faculty to do collaborative, multidisciplinary research involving other colleges.	Need to encourage collaborative research activities	Changing mindset; encouraging staff	
There is a need to catch up in terms of raising awareness, capability building, and incentivizing research activities.	Need to raise awareness and capability building to encourage more to engage in research	Changing mindset; improving skills; motivating through incentives	
Faculties are not motivated to do R&D mainly because of too much work to balance	Need to learn time and tasks management	Improving skills; coaching	
Another is time constraints faced by faculty members due to teaching load, <i>i.e.</i> deloading issues. That's why we encourage; however, their excuse is that they don't have time to conduct research	Need to manage well the core functions	Improving workload assignment and tasks	
Another problem is the weak complementation of research and extension in the organization.	Need to strengthen the complementation of research and extension	Promoting research-extension convergence	
The procurement system delays implementation of research projects.	Need to address problems on procurement process	Being creative in bureaucratic processes	Institutional concerns
Innovative organization has a devoted unit/dept for innovation management	Need focal unit/team to handle key research services to lessen the workload burden	Providing resources intended for innovation activities	
We are lacking in terms of a focal unit that will help us package research proposals in addition to too much load in instruction and other curricular tasks.	Need focal unit/team to handle key research services to lessen the workload burden	Providing resources intended for innovation activities	
Lack of good infrastructure to efficiently communicate information in the organization.	Need the necessary resources for innovation	Providing resources intended for innovation activities	
We have been begging to give more value (percentage) in assessing performance in R&D. However, the HR thinks that their main function is instruction. Right now, we are revising the indicators for faculty performance appraisal.	Need to rethink performance assessment in research and instruction	Rethinking policies and indicators for performance appraisal for R&D involvement	

Table X. Collective description of the themes regarding issues and concerns in R&D productivity in the public HEIs.

Themes	Collective description
Managerial/leader concerns	This theme is collectively described as the need to change the mindset of the individual faculty members to embrace research functions through encouragement and motivation by managers and leaders. Encouragement, mentoring, and coaching of faculty members can help lessen and mitigate the individual and institutional burdens affecting research initiatives and activities in the organization, foster generation of innovative ideas, and facilitate interactions among units and individuals in the organization.
Institutional concerns	This theme is collectively described as the need to address, as an organization, the imbalances in workload and performance assessment for R&D, weak research culture or mindset among the individuals, resources intended for research and innovation, and mainstreaming training and capability building for research.