

EXPLORING THE DIMENSIONS OF INNOVATION CULTURE IN THE PUBLIC HIGHER EDUCATION INSTITUTIONS: TOWARDS IMPROVED ORGANIZATIONAL PERFORMANCE IN RESEARCH AND DEVELOPMENT

Table 1. Synthesis of the dimensions, subdimensions, elements, and characteristics of innovation culture

	Elements	Characteristics	Authors
Organizational Dimension			
• Climate	Entrepreneurial	highly entrepreneurial activities; entrepreneurship	(Alm & Jonsson, 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 artefacts; shared purpose	(Alm & Jonsson, 2014); (Dobni, 2008); (Dombrowski et al., 2007); (Petraite & Ceicyte, 2012); (Schertlin, 2018); (Stock et al., 2013)
	Participation	joint-problem solving; participation by all employees; involvement; participative decision-making	(Alm & Jonsson, 2014); (Dobni, 2008); (Davies & Buisine, 2018)
	Risk taking	willingness to take risks	(Dombrowski et al., 2007)

	Elements	Characteristics	Authors
• Communication	Communication system	democratic communication; communication of the intention to innovate; infrastructure to communicate ideas, knowledge and problems; organizational communication	(Alm & Jonsson, 2014); (Dombrowski et al., 2007); (Schertlin, 2018); (Sadegh Sharifirad & Ataei, 2012)
• Conflict management	Conflict management	management is interested in issues of its employees	(Dombrowski et al., 2007)
• Design	Structure and context	organizational structure; size; organizational context conducive to innovation;	(Petraite & Ceicyte, 2012); (Rao & Weintraub, 2013)
• Processes	Innovative processes	Inner work life; information acquisition, and interpretation;	(Alm & Jonsson, 2014); (Lažnjak, 2011)
	Execution	an environment or context to support implementation; flexibility of work; adaptability	(Dombrowski et al., 2007); (Abdul Halim et al., 2015); (Rao & Weintraub, 2013); (Schertlin, 2018); (Stock et al., 2013)
• Resources	Tangible	money; infrastructure for innovation; infrastructure to support innovation thrusts; resources for innovation; willingness to dedicate resources; safe spaces	(Alm & Jonsson, 2014); (Abdul Halim et al., 2015); (Dobni, 2008); (Rao & Weintraub, 2013); (Dombrowski et al., 2007)
	Intangible	dedicated/flexible time for innovation, access to external competence	(Alm & Jonsson, 2014);

	Elements	Characteristics	Authors
• Rewards and incentives	Rewards and incentives	incentives; incentives and rewards for innovative behavior	(Dombrowski et al., 2007); Schertlin, 2018
• Values	Creativity and focus	creativity; room for creativity; single organizational goal	(Alm & Jonsson, 2014); (Dombrowski et al., 2007); (Schertlin, 2018)
	Learning organization	mindset for learning; learning orientation; management is interested in ideas of its employees; correct handling of mistakes;	(Alm & Jonsson, 2014); (Brettel & Clevén, 2011); (Dombrowski et al., 2007); (Linke & Ansgar, 2011); (Schertlin, 2018); (Sadegh Sharifirad & Ataei, 2012)
	Orientation to technological innovation	orientation towards technological innovation; technological turbulence Innovation-oriented organizational culture	(Brettel & Clevén, 2011); (Davies & Buisine, 2018); (Stock et al., 2013)
Human and Behavioral Dimension			
• Individuals	Growth	mindset for learning, self-determination, presence of innovative individuals	(Alm & Jonsson, 2014); (Rao & Weintraub, 2013)
	Intrapreneurial	intrapreneurship, every employee has innovative responsibility, adaptability	(Dobni, 2008); (Dombrowski et al., 2007); (Stock et al., 2013)
	Open-mindedness	low resistance to change; open-mindedness and questioning of protocol and procedures; influence, or the knowledge and	(Aksoy, 2017); (Dombrowski et al., 2007); (Lažnjak, 2011)

	Elements	Characteristics	Authors
		orientation of employees to support thoughts and actions necessary for innovation	
• Leaders and Managers	Innovative leaders and managers	presence of innovative leaders and managers; managers and leaders supportive of innovation	(Davies & Buisine, 2018); (Dobni, 2008); (Dombrowski et al., 2007); (Abdul Halim et al., 2015); (Schertlin, 2018)
• Teams	Innovative teams	presence of innovative teams; teams or units with resources and facilitation; accountability, relation, motivation	(Dombrowski et al., 2007); (Rao & Weintraub, 2013); (Brettel & Clevn, 2011); (Alm & Jonsson, 2014)
Network and Partnership Dimension			
• Collaboration	External links	collaboration; boundary spanning; engagement; multiple and easy links with outside of the organization	(Aksoy, 2017); (Alm & Jonsson, 2014); (Brettel & Clevn, 2011)
• Customer orientation	Customer understanding	organization-wide customer focus; customer understanding	(Davies & Buisine, 2018); (Dobni, 2008); (Petraite & Ceicyte, 2012)
• Market orientation	Market and environment understanding	orientation towards future markets; market orientation; understanding the environment	(Dombrowski et al., 2007); (Petraite & Ceicyte, 2012)

Table 2. 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) innovation as product or services (2,3)
<ul style="list-style-type: none"> ● develop and promote technologies 	2. innovation as a development of a product or service	
<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)

Source: Extracted from the institutional statements of the four HEIs.

Table 3. 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 	<ol style="list-style-type: none"> 1. innovation as an act of collaborative efforts 	collaboration (1)
<ul style="list-style-type: none"> ● expand their intellectual horizons 	<ol style="list-style-type: none"> 2. innovation as harnessing intellectual horizons 	widening of knowledge and competencies (2)

Source: Extracted from the institutional statements of the four HEIs.

Table 4. Diffusion and learning aspect of innovation in the institutional statements of the four HEIs

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	
<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	quality education and professional training (3,4)

Source: Extracted from the institutional statements of the four HEIs.

Table 5. 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	
<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	a shift to human resource development (4,5,7)
<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	

Source: Extracted from the institutional statements of the four HEIs.

Table 6. 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	<p>an integrated process of human resources, knowledge, and technology development (1,2,3)</p> <p>Innovation as a path toward sustainable development (4)</p>
<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	
<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	

Source: Extracted from the institutional statements of the four HEIs.

Table 7. 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)
<ul style="list-style-type: none"> ● develop globally competitive, work-ready, socially-responsible and empowered human resources 	1. innovation in a changing, dynamic context	

Source: Extracted from the institutional statements of the four HEIs.

Table 8. Meanings, manifestations, and dimensions of “innovation culture” in the public HEIs

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	
<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	
<ul style="list-style-type: none"> Innovative organization promotes creativity 	creativity and avenue for creativity	people and process	Building blocks
<ul style="list-style-type: none"> Innovative organization works as a family 	relationships		
<ul style="list-style-type: none"> Innovation culture as a nurturing culture for both young and old 	relationships		
<ul style="list-style-type: none"> Innovation culture as a culture listening to the problems of the communities 	nurturing and listening, mindset to innovate		
<ul style="list-style-type: none"> Innovative organization involves the stakeholders in improving present technology 	market and customer orientation	process	
<ul style="list-style-type: none"> Delegation of right people to the tasks accompanied by work de-loading measures 	tasking and backstopping		
<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	

Condensed Meaning Units	Code	Category	Themes
<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	
<ul style="list-style-type: none"> • Innovation as embedded in the VMG 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, products	people and process, products	
<ul style="list-style-type: none"> • Innovation culture as embedded in the institutional statements, plans, and policies 	process	products	

Source: Extracted from the FGD and in-dept interviews of the participants.

Table 9. Problems and concerns relating to R&D performance in public HEIs

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, this 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	
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	Need to raise awareness and capability building to	Changing mindset, improving skills, Motivating	

Condensed meaning units	Code	Category	Theme
incentivizing research activities.	encourage more to engage in research	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. 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	Need the necessary resources for innovation	Providing resources intended for	

Condensed meaning units	Code	Category	Theme
information in the organization.		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	

Source: Extracted from the FGD and in-dept interviews of the participants.

Table 10. Collective description of the themes regarding issues and concerns in R&D performance 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.