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RESEARCH ARTICLE

Possible Scenarios on the Future of Polytechnic State University of Bicol (PSUB) – Research Culture by 2030 using Jim Dator's Archetypes of Alternative Futures

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Abstract

This paper explores possible scenarios for the Research Culture of Camarines Sur Polytechnic Colleges (CSPC), to be known as Polytechnic State University of Bicol (PSUB). The paper utilized Jim Dator's four archetypes of alternative futures to construct PSUB's Research Culture possible scenarios by 2030. This paper highlights the assumption that the research culture in PSUB is of world class quality and all of its faculty members are actively involved in research, its disciplined, collapsed, transformative, or business as usual scenarios. Four plausible scenarios have surfaced in this paper: Progressive Research Culture, Lax and Deficit Research Culture, Sophisticated Research Culture, and Transformative Research Culture. The article explored areas for a preferred future by 2030. It requires multiple drivers along faculty, students, administration and community for a better research culture. This study proved to be useful in crafting and anticipating the future scenarios of PSUB's research culture. Preliminary as it may, this study highlighted important building blocks of the four future scenarios. Dator's framework was proved to be very useful in developing the four scenarios, the use of other future study tools will further amplify plausible scenarios for the Polytechnic State University of Bicol.

KEYWORDS:
PSUB, Research Culture, Future Scenarios, Jim Dator's Alternative Futures

1 | INTRODUCTION

How effectively a nation mobilizes its capital to boost competitiveness and increase the output of goods and services determines its economic development. Resources include labor and human expertise, finance, property, and natural resources, with technology, science, and production being major factors influencing productivity (Cororaton, 2002).

In a widely controversial paper published in Foreign Affairs in 1994 titled "The Myths of Asia's Miracle," Krugman claims that Singapore's fast development was due to capital accumulation, not a "miracle." Its growth path is comparable to the Soviet Union's capital accumulation type of growth, which saw fast growth in the 1950s before seeing a core economic recession after reaching its limits. "Economic growth that is dependent on input expansion rather than output per unit of input is ultimately subject to diminishing returns," he noted.

Economic development and technological innovation are mutually reinforcing (Hirono 1985). In other words, higher rates of growth tend to lead to increased production by technological advancement and research and development, and vice versa. This is particularly true as the returns to scale are rising. The outer change of the output feature in such situations would have no boundaries, meaning that there be no growth limits.

The emergence and spread of the information culture have presented higher education with new problems. Higher education must adapt to the rapid shifts that define information-driven social, political, and technical transformations in the twenty-first century since it is located at the center of the information society (Teichler, 2000). Considering these shifting circumstances, higher education must rethink or reengineer its mandate and functions. The relevance of higher education institutions is shown by how their policies and practices align with the expectations of their students, as stated by participants at the Asia and Pacific Regional Conference on "National Strategies and Regional Cooperation for the Twenty-First Century" (Regional Conference on Higher Education, Tokyo, Japan, 1997), and echoed by the World Conference on Higher Education (WCHE, 1998).

Due to the high demand in the academe in terms of research, the Philippines is paving the way to cope with the high demands in producing published papers in a reputable journal. According to Mendoza (2015), as of July 2015, 28 Philippine scientific journals out of 777 academic journals were classified in Thomson Reuters (TR), Scopus, or both master journal lists. Thirteen of these research journals are published by universities, two by federal agencies, ten by technical associations, and three by independent for-profit or non-profit organizations. Nineteen of these publications are older than 25 years, with the Philippine Journal of Science and the Philippine Agricultural Scientist being the oldest at 108 and 103 years, respectively, in print. Like those in other Asian countries, scientific journals in the Philippines face a growing number of challenges. Getting included in TR's master journal lists and citation directories, or both; securing funding; attracting a broader readership; achieving higher impact factors; bidding for papers; and expanded submission of submissions from outside the country are just a few of the obstacles. The National Academy of Science and Technology Philippines has granted excellent publishing awards for research papers written in local journals for the past two decades to encourage the improvement of local journals. The Philippine Commission has approved local journals published in either the TR or Scopus journal master lists on Higher Education, offering cash grants to accredited journals. Universities, technical and government associations, and universities hold conferences for academics and editors on scientific journal composition and editorial management. A group of Philippine science editors has created a network to collaborate on upgrading and modernizing selected journals to meet international standards.

The number and utilization of research in an academic institution is one of the bases of the World University Rankings. The ASEAN Post Team (2020) posited that higher education rankings are a quick reference guide to universities that can help prospective students and parents figure out what they want from a university. It is a simple way to find a few institutions where you can do more research. The Quacquarelli Symonds (QS), Times Higher Education (THE), Academic Ranking of World Universities (ARWU), and Center for World University Rankings are some of the most well-known ranking entities (CWUR). QS, a ranking organization, headquartered in the United Kingdom, uses a six-category methodology: scholarly credibility (40 percent), employer reputation (10 percent), faculty-student ratio (20 percent), citations per faculty (20 percent), international faculty ratio (5%), and international student ratio (5%). (five percent). Times Higher Education, another rating body, uses 13 success metrics divided into five categories: teaching (30%), analysis (30%), citations (30%), world outlook (7.5%), and business profits (i.e., information transfer) (2.5 percent). The Times Higher Education University Impact Rankings are the only global results tables that evaluate universities against the United Nations (UN) Sustainable Development Goals (SDGs), and they have been tweaked to suit Asian institutions' special characteristics.

The transition from a State College to a State University is a collaborative effort of all personnel who work tirelessly day-in and day-out securing that all parameters are met. To circumnavigate the parameters and to ensure passing the accreditation of becoming a State University, this study aims to explore possibilities by using future lenses – upon examining the status of the college when it comes to research, the researchers felt the need to explore the future possibilities of the soon-to-be university to ascertain circumstances that have high possibilities to happen.

2 | METHODOLOGY

2.1 | Research Design: Research Culture by 2030 using Jim Dator's Archetypes of Alternative Futures: The Four Futures Framework

This framework is by Professor James Dator, one of the fathers of futures studies in the United States. It's widely considered his most important contribution to the field. Dator first developed this framework in the 1970s, and it has formed the basis of much

of his life's work since then. Dator's framework is founded on two deep truths about our relationship to the future. First, we can never know for sure what lies ahead. That means we should think in terms of various possible futures, and not run the fool's errand of trying to make predictions with high degrees of certainty. Second, humans make sense of the future in the same way we make sense of the past: by telling ourselves stories about it, therefore, it pays to examine those stories. If we can understand more about them, we can better orient ourselves in the present and plan for what's next.

Figure 1 shows the Four Future Alternative by Dator (2009):

1. **Continued growth** - the expectation is that the current trajectory of development will continue, roughly at the same pace and in the same direction as until now. This is the dominant view that policymakers, urban planners (and the general society) work with. Continued growth mostly refers to economic growth.

2. **Collapse** - the expectation (or fear) that due to some unforeseen external cause (or an internal implosion) the current system will regress to a lower level of development. This can be framed as a dystopian catastrophe but can also be imagined as a (desirable) return to a slower pace.

3. **Discipline** - the expectation that continued growth will be either undesirable or unsustainable long term, leading the society to organize itself around a set of overarching values or principles (ancient, traditional, natural, ideological, etc) to exercise constraint.

4. **Transformation** - the expectation that current forms of behavior, beliefs or norms will evolve, or be replaced by new norms to address some of today's challenges. This is often imagined to be achieved through high-tech developments or spiritual transformation.

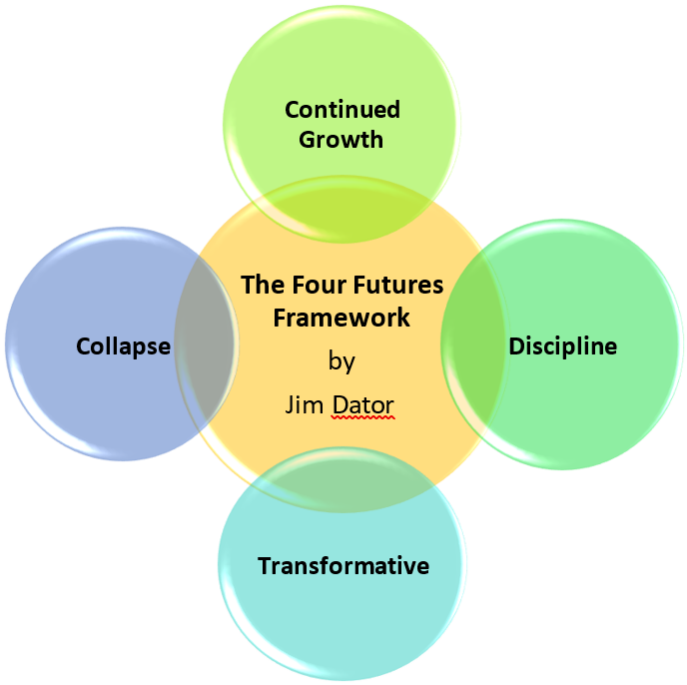

FIGURE 1 Four Futures Framework by Professor Jim Dator

3 | RESULTS AND DISCUSSION

3.1 | Four Alternative Futures of the Research Culture in Polytechnic State University of Bicol (Possible Scenarios)

3.1.1 | Scenario no. 1: PROGRESSIVE RESEARCH CULTURE (Continued Growth)

As cited by Cruz (2013), whatever happening is extended and even amplified in the future. PSUB, currently has a slow yet progressing track when it comes to research. Instructors and professors as well as the administrative staff are struggling to adapt research into the system. The current research status quo in PSUB can be amplified with the drivers of change and challenges in research for development as cited by Cannon (2016). Shown in Figure 2 are the interplay of the five (5) challenges and drivers.

FIGURE 2 Progressive Research Culture: Drivers of the Continued Growth Future

The Five trends driving change in research for development. Exploring the key drivers of change and challenges that lie ahead as according to Cannon (2016) are as follows:

- A new global development landscape with a commitment to science and technology at its heart but a need for a clear global research agenda to deliver on the ambition.
- Uneven, but a rising global investment to research and innovation leading to changing geographies of partnership and driving calls for southern-led agendas and research management.
- A fragmented and rapidly changing development landscape with rapid economic development, rising inequality, or increasing fragility occurring in different countries that could lead to tensions in the focus of development research agendas.
- The potential for transformative innovation through social and technological ideas may drive funding but avoiding hype and scaling successful ideas are imperatives.
- 'Wicked' problems and interdisciplinary research driving the need for new cultures but also challenging incentives around excellence and impact.

3.1.2 | Scenario no. 2: LAX AND DEFICIT RESEARCH CULTURE (Collapsed)

Dator (2009) stated that a collapsed scenario is when the status quo degenerates into a "lower" state of "development". It is further termed as a "worst-case scenario". In this scenario, the term "lax" was used, it is when instructors and professors alike have become stagnant to the extent that they are researching for the mere sake of compliance and worst is neglecting research. Further, there is a research "deficit" meaning there is a lack of quality research by instructors and professors that contribute to the development and progress of the institution. Karlin (2019) posits that there are challenges and drivers of poor research culture is shown in Figure 3 below:

FIGURE 3 Research Lax and Deficit: Drivers of the Collapsed Future

CHALLENGES AND ISSUES (Karlin, 2019) OF A COLLAPSE FUTURE SCENARIO

There are three (3) categories on which a poor research culture can be based. Researchers' behavior was seen as both a result and a driver of poor research culture.

- **RESEARCHERS**
  - Researchers' diversity: not enough is known about the current make-up of the research workforce not only on an individual level, but also the dynamics of exclusion at an institutional or systemic level. This is also about intersectionality and how different dimensions of disadvantage can reinforce one another.
  - Team dynamics: Not enough is understood about interpersonal dynamics in the workplace and the benefits and challenges of collaborative working.
  - Workload: expectations to 'publish early and often and work long hours.
  - Insufficient leadership: management and leadership skills not being developed ad valued enough.
  - Career progression: difficult for early-career researchers to get permanent positions and stable careers, plus the gulf between aspirations and opportunities.
  - Career mobility: perceptions that moving away from academia is stigmatizing and difficult.
- **RESEARCH**
  - Reproducibility: addressing not only the questionable research practices but also the reward structures that are a root cause.

- Research outputs: publications are over-prioritized at the expense of a wider range of meaningful contributions.

- **RESEARCH ENTERPRISE**
  - Regional imbalance: concentration of research industry perpetuates social and economic inequality.
  - Proliferation of poor metrics: their damaging impact on research culture – identifying and replacing these poor metrics with meaningful measures.
  - Too much competition: the fight for resources in a project-grant-based research environment.

3.1.3 | Scenario no. 3: SOPHISTICATED RESEARCH CULTURE (Discipline)

Sophisticated research culture or the interdisciplinary research culture. The PSUB is a polytechnic state university, initially flourishing with highly technical research papers, but has now been focusing on interdisciplinary research, which in turn, have lessened the technical aspect yet have gained an interdisciplinary research culture. As the Repko A (2011) report Facilitating Interdisciplinary Research identifies four primary and overlapping "drivers" of interdisciplinary research and learning.

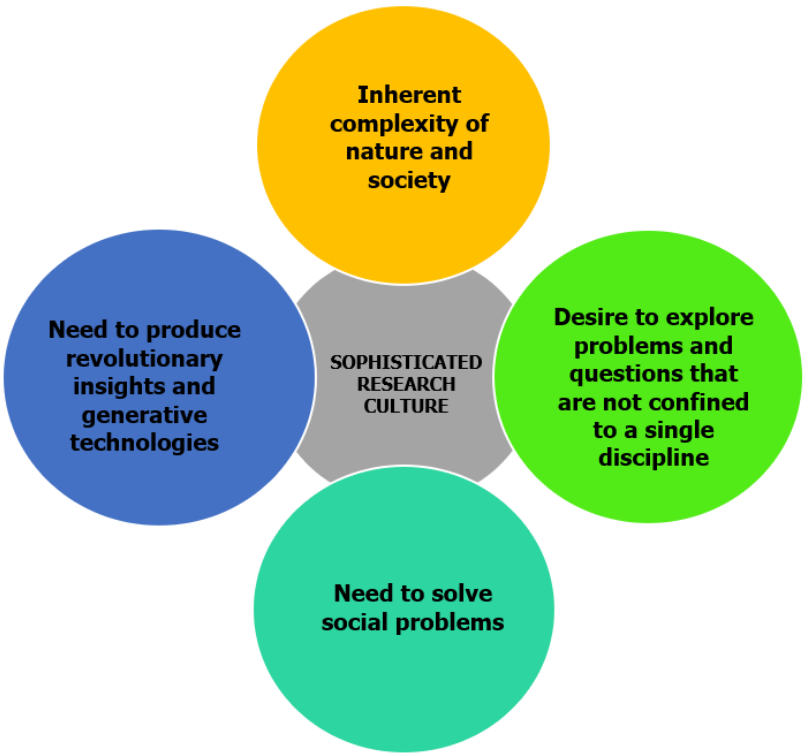

FIGURE 4 Sophisticated Research Culture: Drivers of Discipline Future

As shown in Figure 4 the different drivers of highly interdisciplinary research are (a) the inherent complexity of nature and society, (b) the desire to explore problems and questions that are not confined to a single discipline, (c) the need to solve social problems, and (d) the need to produce revolutionary insights and generative technologies.

The four primary drivers propelling the growth of interdisciplinarity in research and education culture are as follows (National Academies, 2009):

1. The Inherent Complexity of Nature and Society. The first driver of interdisciplinary education and research is the need to understand the inherent complexity of nature and society. The complexity discussed here is of two kinds: the complexity of real-world problems that involve natural systems or human society, and the complexity associated with the meaning of

cultural artifacts, past and present, such as literature, visual art (e.g., films, paintings, and sculptures), and performance art (e.g., plays, dance, and musical compositions). Real-world problems concerning nature and society are typically complex, ill-structured, and not readily solved.

2. The Desire to Explore Problems and Questions that are not Confined to a Single Discipline. Interdisciplinary is also driven by the desire to explore problems and questions that extend beyond the confines of a single discipline (National Academies, 2005, p. 16). Interdisciplinary fills gaps in knowledge created by inattention from the disciplines. From these gaps emerge interdisciplinary spaces and new knowledge formations such as cultural botany, geological information systems, environmental and ecological studies, cognitive science, urban and public policy studies, forensic studies, crime and justice studies, literary-cultural studies, sociological cultural studies, area studies of various kinds, word and image studies, cultural analysis, visual culture, ethnomusicology, popular music studies, jazz studies, American cultural studies, and ethnic studies of various kinds (Klein, 2005a, p. 78).

3. The Need to Solve Social Problems. Certain kinds of problems, increasingly those of public interest, are not being adequately addressed by individual disciplines. Such high-priority problems include food safety, genetically modified plants and animals, access to affordable education, terrorism, job creation, poverty, community development, and immigration.

4. The Need to Produce Revolutionary Insights and Generative Technologies. A fourth primary driver of interdisciplinary research and learning is the need to produce "novel and revolutionary insights" and "generative technologies" (National Academies, 2005, pp. 35, 39). Revolutionary insights are those ideas that can transform how we learn, think, and produce new knowledge. Generative technologies "are those whose novelty and power not only find applications of great value but also have the capacity to transform existing disciplines and generate new ones" (p. 35).

3.1.4 | Scenario no. 4: TRANSFORMATIVE RESEARCH CULTURE (Transformation)

PSUB transcends its mission of transforming the lives of the community into a life free from poverty through technological advancement and innovation through research. In this scenario, the PSUB can transform the lives of its community stakeholders to a free of poverty. Wittmayer, Hölscher, Wunder Veenhof (2017) defined transformation research as an established research field that joins together different research streams focusing on societal change towards sustainability shown in Figure 5 .

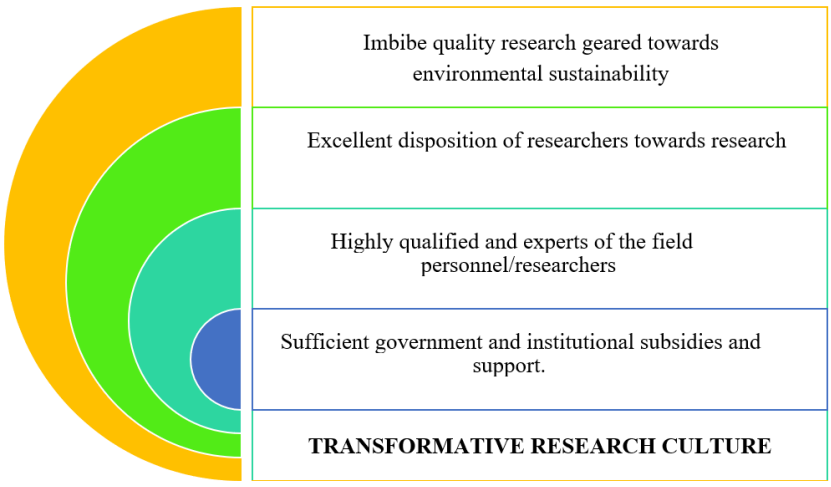

FIGURE 5 Transformative Research Culture: Drivers of Transformative Future

There are four drivers for this research culture. These are (a) imbibe quality research geared towards environmental sustainability, (b) excellent disposition of researchers towards research, (c) highly qualified and experts of the field personnel/researchers; and (d) sufficient government and institutional subsidies and support.

Table 1 shows the summary of the four future scenarios on the future of the Research Culture of PSUB.

TABLE 1 The Four Future Scenarios: Possible Scenario on the Future of the Research Culture of Polytechnic State University of Bicol (PSUB) using Jim Dator's Archetype of Alternative Futures

Continued Growth Progressive Research Culture	**Collapse Lax and Deficit Research Culture**	**Discipline Sophisticated Research Culture**	**Transformation Transformative Research Culture**
The PSUB is a strong center of research and development focusing on a strong agenda encompassing the regional and national research concerns of the Philippines, thereby contributing to the growth and development of technical and skilled workforce and authentic outputs of research. • A new global development landscape committed to science and technology at its heart but a need to craft a global agenda on research and development. • Continued rising of research culture and growth among its stakeholders. • Less tensions on the growing research community and perpetual collaboration for sustainability. • Transformative innovation through social and technological ideas that drive greater research opportunities for students, instructors and professors and other community stakeholders. Research driven new cultures but also challenging incentives around excellence and impact.	PSUB's research culture has declined and regressed due to several factors: RESEARCHERS • Researchers' diversity: not enough is known about the current make-up of the research workforce not only on an individual level, but also the dynamics of exclusion at an institutional or systemic level. This is also about intersectionality and how different dimensions of disadvantage can reinforce one another. • Team dynamics: Not enough is understood about interpersonal dynamics in the workplace and the benefits and challenges of collaborative working. • Workload: expectations to publish early and often' and work long hours. • Insufficient leadership: management and leadership skills not being developed and valued enough. • Career mobility: perceptions that moving away from academia is stigmatizing and difficult.	As part of the continued growth of PSUB as an emerging and prominent research institution in the ASEAN and in the whole world, it significantly shifted its focus to a more interdisciplinary and a wide array of research agenda, thus, making slower growth and developing a less quality research. Drivers to this change are: (a) the inherent complexity of nature and society – since PSUB aims to become the answer to the needs and demands of society; it shifted to low quality bit high quantity research. (b) the desire to explore problems and questions that are not confined to a single discipline – being driven toward excellence, the PSUB has step out of the line to venture to new possibilities but the risk of going out of its comfort zone has amplified the low quality of research developed by its members, (c) the need to solve social problems – problems on the social ecosystem become one of the major concerns of PSUB setting aside the polytechnic quality of institution: and, (d) the need to produce revolutionary insights and generative technologies – being driven to produce technologies to make life easy and manageable to all, the PSUB reacts through investing to technological advancements.	As the PSUB President puts it, the PSUB is the leading institution in transforming lives of Bicolano to be free from poverty and PSUB is the catalyst that ignites putting passion into commitment among its members. Radiating it towards quality instruction, extension, production, and RESEARCH. Transcending it to the mission of transforming the lives of the community into a life free from poverty through technological advancement and innovation through research.

- Career progression: difficult for early-career researchers to get permanent positions and stable careers, plus the gulf between aspirations and opportunities.

RESEARCH

- Reproducibility: addressing not only the questionable research practices, but also, the reward structures that are a root cause.
- Research outputs: publications are over-prioritized at the expense of a wider range of meaningful contributions.

RESEARCH ENTERPRISE

- Regional imbalance: concentration of research industry in London and in the south-east, which perpetuates social and economic inequality.
- Proliferation of poor metrics: their damaging impact on research culture – identifying and replacing these poor metrics with meaningful measures.
- Too much competition: the fight for resources in a project-grant-based research environment.

3.2 | Visioning a Preferred Futures by 2030

The sole purpose of developing future scenarios is "visioning a preferred future" (Dator, 2009). It goes beyond imagining the preferred future. It involves deciding what to do at present to make the imagined future a reality. As Dator (2009) state it, "the images of the future, and actions taken on the basis of those images, do play an important role in influencing what becomes an actual future". In making the transformative future of the Research Culture in Polytechnic State University of Bicol (PSUB) a possibility by 2030, its seeds must be planted now. Starting with boosting the research capability of the institution in conducting research.

FIGURE 6 Drivers of the Preferred Future of the Polytechnic State University of Bicol towards Research Culture

Shown in Figure 6 , the proper mindset of the faculty is the most significant driver of the preferred future of PSUB. They are the research workforce and serves as the researchers in the field, being exposed firsthand to the ocean of teaching technical education. As of April 12, 2021, in the report given by the Director of Institutional Planning and Development (IPDO), fifty-four (54) out of 133 full-time faculty members, or 41% are actively involved in research. Furthermore, thirty-two (32) out of 133 or 24% of the faculty members are engaged in research have patents, articles in refereed journals. With this data, it can be inferred that the Camarines Sur Polytechnic Colleges (CSPC) still has some room for improvement to be granted with the University status (needed for the conversion of Polytechnic State University of Bicol (PSUB)). The research culture in CSPC is in a work-in-progress. The faculty must be fired up to propel the institution to a university. Second, the strong commitment to Science and Technology can break the chains of research lax. This future is essential since commitment to work sparks up excellence by working smart.

Third, teachers' vertically aligned qualifications in each field can spike the growth of excellent research culture. Since PSUB is the only institution in the Bicol region providing quality technical education, it must first have quality professional fields vertically aligned in each field or program being offered in the institution.

And lastly, sufficient government and institutional incentives, subsidies, and support towards research. Research is never an easy task for researchers especially those that are beginning or novice in the field. With proper and sufficient government and institutional support especially to research funds and grants, this can inherently motivate teachers to conduct quality research. Currently, the CSPC grants research funds and incentives to faculty-researchers.

With the above drivers stated, it is expected to trigger positive changes in aspects determined and not. Without the greater participation and proactive actions of the government, institution, and stakeholders, PSUB (formerly CSPC) becoming a center of research excellence would be a distant dream. After a long, tedious, anxious, and dark time in the research culture of CSPC, fellow Bicolanos and CSPCeans alike, deserve a life free of poverty through technological advancement and innovation through research.

4 | CONCLUSION

The future lies in uncertainty but with the proper attitude and proactive actions today, it will resound the future. The conversion of Camarines Sur Polytechnic Colleges (CSPC) to Polytechnic State University of Bicol (PSUB) is a dream come true for all CSPCeans. It is the researchers' long dream of bestowing CSPC her university hood. Key areas that are evaluated by the Commission on Higher Education (CHED) are the research capability of the institution. With this study, the researchers can explore the dark areas that need refinement for the beloved institution. Using Dator's Four Future Archetypes, the researchers can circumnavigate the vast realm of research. It enabled them to determine the interplay of different factors that may contribute to possible scenarios in the future. Through future studies, it provoked the researchers' inquisitive minds and tickled their imagination, and force them to raise eyebrow-raising questions of "what ifs" that require a deep dive to the unknown.

This paper suggests a preliminary investigation and discovery in making a desirable future for CSPC possible. However, it requires further articulation and analysis. The building blocks of desired changes in the institution remain preliminary and warrants careful institutional planning to ensure that the preferred future becomes a reality.

At best, the current study frames the discourse of the future of the Research Culture in Camarines Sur Polytechnic Colleges. The exploration of different scenarios could be further enhanced and magnified through greater participation of stakeholders and more future-thinking tools. The same could be said in laying down the strategic agenda to make the desired future plausible.

Utilizing Dator's archetypes of future scenarios, the paper can develop the four scenarios of the future of the research culture in CSPC. Just like many future scenarios, it remains incomplete. Given its current limitation, the researchers are hopeful that the paper has provided an enlightened and a little more structured discourse about the future scenarios of the research culture that will serve as a starting point of subsequent discussions and explorations. This paper was constructed to give vital building blocks to achieve the desired and preferred future. Due to time constraints and the travel and gathering restrictions, the paper caters merely to the preliminary drivers of change for the future. This study further solicits focus group discussions on salient points and greater participation of the different stakeholders. Coming up with a more plausible scenario will entail the participation of people with active involvement in the field. The use of other methodologies of futures studies will be of great help in illuminating the understanding of the futures of Camarines Sur Polytechnic Colleges.

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