LIRIP

JOURNAL OF INTERDISCIPLINARY STUDIES

Lirip is a peer-reviewed journal published annually by the University of the Philippines Diliman Extension Programs in Pampanga and Olongapo, Clark Field, Pampanga. The publication serves as a forum for interdisciplinary studies dealing with a broad range of issues and problems that are subject to careful analysis reinforced by well-researched evidence or to creative interpretation translated into literary essays.

For Contributors

1. Articles must be in MS Word format, follow the APA documentation style, and use Times New Roman, 12.
2. Articles must be original, written in English, Filipino, or any local language. An article written in a local language must be accompanied by an English/Filipino translation.
3. Each article must have an abstract, a list of key words, and a bio-note (not exceeding two paragraphs) of the author.
4. Every article is submitted for blind review to two referees, whose recommendations serve as the Editors' bases for the decision to publish the article.
5. Articles must be attached to an email addressed to the Editor-in-Chief, *Lirip*: Journal of Interdisciplinary Studies and sent to upepp@upd.edu.ph

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Introduction

The keynote address of National Artist Resil B. Mojares at "Reading the Regions" conference in Davao City last February 2020 has been included in this volume. Besides the privilege of having NA Mojares as contributor, it is also a stroke of fortune that his paper can fittingly set the tone of this *Lirip* issue.

With the title "Reading and Writing the Region," the paper brings to light the "rise of academic interest in the local, the popular, and the regional." At the interface between the local and the national, the fragmented and politicized concepts of nationhood are apparently no longer tenable. The centrality of the "regional" and the qualitative leap of local studies in the field of literature are affirmed by Dr. Mojares. Placing value on local resources and cultures, he widens contexts of intellectual and academic pursuits. Given this mindset, not only literature but also other disciplines can move toward viewing more spheres of regional knowledge.

His assertion regarding the "lack of belief in our pallid constructs of the nation state" is a challenge that pulls together related sociological, political, historical, and cultural dimensions of regional studies. Provocative insights into the challenge do not overlook but perceptively examine ideological constraints and other viewpoints refracting the idea of nationhood at very narrow angles. Dr. Mojares mounts substantial arguments against what he believes as a "reductive" idea, namely "that regionalism is our bane." He convincingly demonstrates the primacy of the "regional" by citing the post-Martial Law "interest in decentralization, autonomy, and people empowerment," etc. The regional is crucial in "broadening and enriching the base of a national culture"—an understatement emphatically driving home his point.

A logical inference is that the dictum "to be local is to be global" is preceded by "to be local is to be national." The latter rests solidly on the internal strength and coherence of local cultures whose self-determination has been established naturally. Dr. Mojares, in fact, reckons that "the regional can no longer be thought of as marginal." This perspective is worth considerable attention and critical engagement, without presuming that the historical and political underpinnings of the aspects of the regional can be ignored.

To be emphasized is the growing recognition of the value of locality embodying its distinct identity. Existing frontiers characterizing this uniqueness make a great contribution to different fields of knowledge.

Dr. Mojares cites the "utility of the regional for writers," in particular, and underscores location as their "comparative advantage." Writers' resources—language, local tradition, folklore, history, etc.—are all drawn from their geographic location, profoundly shaping their creative consciousness. Rootedness is a wellspring of precious heritage. And a sense of self is inextricably linked with a sense of place—a vital thread in the act of creation. The National Artist makes his point clear regarding the advantages of being "rooted in the realities of the region":

> It means having a particular vantage point from which one can look out into the world;
> it means knowing a particular landscape intimately deeper than others would; it means
> having a language, a sensibility, and a style of feeling and thinking that could not but be a
> product of one's having been formed in a particular place and way of life.

Such profound and critical exposition is also a practical reflection on the significance of the regional, with the local writer operating dynamically and creatively within a given milieu. True to his calling as National Artist, Dr. Mojares makes way for the pursuit of national literature by imbuing local literature with important latitudes that can enhance national literature. Focusing sharply on this role of local literature promotes not only inclusivity but also diversity, appropriately covering the literary landscape of the country.

A meaningful way of framing the regional does not only happen in the field of literature. Other disciplines have also brought regional studies into sharp focus. The present volume features locally situated interdisciplinary research. To put local research—a kind of driving force for advancement—to the service of the community is a dominant theme.

And what can be more local than Indigenous communities whose lifescape and landscape are inextricably intertwined? This strong identification of the Indigenous tribes with their natural habitat is an idea that has been an acknowledged tradition of concern among different disciplines, not to mention advocacies in areas such as sustainability and conservation.

Florencia Charito Sebastian's "reflexive ethnographic" paper amply subscribes to the aforementioned tradition. Safeguarding the Pinatubo Ayta communities, which have always been subject to the inherent dangers of development, is a fundamental issue confronted by the study. The effort to elucidate the embeddedness of this tribe's existence in its territorial realm and to highlight the need to preserve its cultural heritage is a key contribution to the growing array of regional inter-disciplinary researches.

Describing the Aytas and underscoring the likelihood of losing their traditional resources under the disruptive processes of development, Sebastian frames her analysis of the impact of this progress syndrome and goes right to the heart of the matter. She admonishes that inclusivity be an aspect of the developmental paradigm and that support be provided by institutions to prevent the "disappearance or cultural annihilation" of the tribe.

With such negotiated postulation, the plan regarding the transformation of the former American military base into New Clark City is brought into focus. The Aytas, who will be caught up in this change, remain powerless as indicated by the research. Thus, rising to this challenge, the researcher joins hands with these threatened people and attempts to provide a holistic vision that ties development with cultural and environmental sustainability. She builds upon this concept the inclusive development approach that should provide "culturally–appropriate education to this group" and "a central role in bio-diversity development." In particular, she proposes the "Ayta Ethno-Botanical School" to be located in an area "devoted to the planting of forest and fruit trees interspersed with vegetable, medicinal and other plants for food and medicines and other domestic uses." A comprehensive plan that includes a contextualized curriculum has been suggested, and among the expected outputs of the school are: "knowledge-reclamation of the Aytas of themselves, their heritage, their community, and the world around them; rehabilitated, developed, and protected forest in the

New Clark City and subsequently the forests in the ancestral domains of the Aytas." This trajectory has a lot of advantages since it entails collaboration and integration of the tribe in the pursuit of development. Endowed with unstinted Indigenous knowledge and practices, Aytas can nurture biodiversity, which has been in their custody for ages.

By making a case for upholding the welfare of the Aytas, Sebastian's research has generated significant data and valuable insights that are useful in hedging in the tribe's ecological and cultural domain as well as in overcoming the threats of the hegemony of modernization and mindless development.

Still on local knowledge and invaluable heritage, "Mathematics in Art: Color Symmetries of Pampanga's Giant Christmas Lanterns" explores a new dimension of a traditional craft in the province of Pampanga. Giant Christmas lanterns are local crafts that are recognized as essential to the continuing cultural progress in the province. These cultural symbols bespeak the Kapampangan creative construction organically linked with a whole gamut of influences as substantially traced by this research. And with the indication that lanterns have more potentialities for further innovation, the attention of the current researchers has been drawn.

The writers, Imogene Evidente and Angela Carreon, take an academic perspective based on the classic relation between art and mathematics. "Art can demonstrate the elegance of mathematical theory" is one dictum; "Conversely, math is a servant of the arts" is another. Embracing such harmonizing principle, the authors embark on an almost ceremonious representation of reciprocity as they examine the lantern structure. Their technical competence becomes a large factor in discerning the marriage, so to speak, of mathematics and art in the case of the cultural icon of the Kapampangans.

Their approach, in both its traditional and technical sense, includes mathematical postulates for the enhancement of the inherent features of native craftsmanship. Focusing on color symmetry, an integral element of a lantern, the researchers are able to offer a relatively new method to express fascinating patterns. The visually dynamic rhythm of bright colors being highlighted in the work of art has always been lavished with admiration, and will be all the more impressive if this artistry is supplied with mathematical formulation as a source of fresh vitality. With this innovation, the

symmetry can display contrast and variety—a quality of liveliness that is apt to furnish the lantern even more striking effect.

Such elaboration aided by mathematics is in accord with the imaginative rendition of the product. Thus, a natural corollary is that mathematics can very well be an instrument of the imagination.

Math art, therefore, opens up an exciting interdisciplinary frontier with its rich repertoire of creative and, at the same time, systematic methods. Evidente and Carreon have underscored the great promise offered by the interface between the two fields. To substantiate their point, they cite Professor Rene Felix of the UP Mathematics Department who "pioneered the study of symmetry and color symmetry in the country." This remarkable but rare appropriation of the math art concept because of its apparent complexity is acknowledged by the authors. But the dreaded difficulty does not prove to be insurmountable. Their current study demonstrates the possibility of fostering math art in the area of local craftsmanship. And this innovative contribution to the creative process of lantern-making, to a great extent, will be an important factor in propelling the intended extensive promotion of the creative industry in Pampanga.

With this plausible conception and application of math art in lantern-making, the researchers have established a strong reason to encourage "collaboration between mathematicians and artists, especially those of Central Luzon."

Another research, "Evolution of Management Control Systems in Private Non-Profit Higher Educational Institutions" by Purisima Panlilio, has been carried out in Pampanga. The case study has generated promising accounts relative to the present state of higher education in the locality. High-valued quality and relevance of education as the foremost priority can be gleaned from the results of the study involving local educational institutions.

Panlilio diagnoses the management control systems of three private institutions and points out the revitalization process which they have undergone, leaving them a net gain of organizational maturity. She does not fail to mention their "rich academic histories" as they pioneered the offering of higher education—their long-term commitment to their communities.

Prodded on by this consideration, they have consistently pursued their vision and successfully put up with the swirling currents of change through the years of their existence. For instance, they have surmounted the hurdle of fast advancing technology and the introduction of a new system such as K-12.

Moreover, the fact that the management controls and processes of these institutions evolved from informal to formal systems to respond to the turbulent wave of technological, economic, and social changes is a dawning recognition of their improved capacity and capability. Thus, higher levels of performance can be expected in their lines of enterprise. This renewed confidence is fairly impressive, adequately meeting the required standards specified by Panlilio. To a great extent, it is the openness to new developments outside the area of traditional practices that is fostered within the organizations—a rewarding value and an enabling reason to achieve goals effectively.

Evident in the next research is the distressing impact of the COVID-19 pandemic, not sparing any domain of existence. The far-reaching and severe effects of the plague, as experienced by a sample of educators, are the featured narratives in the paper "Coping with the Transition to Remote Learning: The Experiences of Tertiary Level Business Educators in Angeles and in Clark, Pampanga" by Maria Eunice Felix.

Hard-pressed to perform their duties, the educators have struggled to develop adaptive measures as they face the transition demands of remote learning. Their sagacity to switch to a different teaching scheme has been challenged by an unnerving situation caused by the pandemic. And Felix distills their "lived experiences" and issues—which are possibly integral to their introspected concerns during a bewildering transitional period—and brings out corresponding themes implicit of the immense value the normal teaching methods hold in the teachers' thoughts and even emotions.

Felix counts on her subjects' responses in her study using her "phenomenological" approach. The flux of experiences that lend themselves to scrutiny reveals the educators' complex mental processes and initiatives in coping with an unforeseen dilemma: a phenomenon, indeed, and a timely piece of inquiry.

Despite the uncertain transition period, insufficient technical support, and unpredictable results of adjustments, the educators, readily yielding themselves to an emergent system of instruction, have not lost their control over their situation but have capably set the direction of the new learning set-up. And Felix has this to say: "remote learning has promoted a learner-centered approach compared to the teacher-centric method used before this transition."

A closer observation of the articles in this volume reveals how the writers have sought out the fruitful knowledge derived from their local community and found the latter rich in potential areas of exploration. Stimulated precisely by the rigorous exposure of their researches, the writers are able to expand the frontiers of regional studies.

Finally, to widen its spectrum of discourses, this issue has made room for book reviews by Niles Jordan Breis. With his light and impressionistic approach, he communicates the socio-cultural and aesthetic value of: *Agwat-Hilom*, an anthology of literary pieces focusing on COVID-19, *Balager, isang kalipunan ng sanaysay* and *Maqueda sa Alimpuyo ng Isla, isang kalipunan ng mga kwento.* Contributors of *Agwat-Hilom* are from the different regions of the country; on the other hand, writers of the *Balager* and *Maqueda* are both from Bicol. Essentially, the reviews round out the chain-link of regional studies created in this volume.

Julieta C. Mallari, Ph.D.
Editor

Reading and Writing the Region[1]

Resil B. Mojares, Ph.D.

{1} The rise of academic interest in the local, the popular, and the regional—in fields like literature and history—started in the early 1970s. I just noted, for instance, that the first paper on the subject of regional literature that I presented came in 1976, at the 21st American Studies Seminar held in Los Banos, Laguna (Mojares, 1976). And so the theme of our conference today is part of a long-running conversation that involved many over several decades. But it remains an important subject, one that is vitally current, and one on which there are things that have not been said since the subject has not stood still and neither have we.

{2} Today, I would like to revisit the idea of the *region*, and then speak of the utility of the *regional* to writers and, by implication, readers as well (Mojares, 1990).

Historically, the common meanings of the *regional* have been condescending and unflattering—outlying, peripheral, parochial. The regional frequently evokes the notion of survivals, of something residual. This is so in a situation when the nation-state is assumed to be an achieved reality, where localities are imagined to have been effectively incorporated into a larger, supra-regional community. What harkens to the regional is then perceived to be nativistic, sentimental, or even divisive.

All this, however, suggests a simplistic view of the processes of nation-formation. It is to imagine serially what is best conceived as having simultaneous existence. *Nation* and *region* are interacting, simultaneous, mutually constitutive realities. They implicate each other and are caught up in a process in which their values are not fixed. *Nation* and *region* are historical artifacts. They involve boundaries, or boundedness, which are not immutable or timeless but dynamic because they are socially and historically constituted. They involve, as well, relations of identity and power which either

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pull them together or pull them apart. To reflect on the position of the region is, unavoidably, to reflect on the state of the nation itself.

As sociocultural units, regions are not unproblematic and self-evident. How, for instance, does one proceed to define a "region" like the Visayas, a word of uncertain etymology, coined by outsiders, coming into its current use, perhaps only in the seventeenth century, to refer to some vaguely defined territory?

What of Mindanao itself? What makes it a single, definable unit? Mindanao may be easier to imagine than the Visayas as an integral unit since it can be viewed as a single land mass, with its offshore islands. Yet, the reality on the ground is much more complicated given Mindanao's history and its mix of languages, religions, and ethnicities.

The complexity is illustrated in the word *Mindanaoan.* To speak of the inhabitants of Mindanao as *Mindanaoan* is relatively new. I recall, growing up in Mindanao and even much later, people would identify themselves as *taga-Mindanao*, which is more a place-reference than a mark of identity. Or it was more likely for people to call themselves *Cebuano*, *Ilocano*, or *Maranao*, or identify themselves by their province of origin, like *Zamboangueño* or *Dabawenyo*. An all-embracing word for the people of Mindanao did not exist. The current discourse on a *Mindanaoan* identity that transcends the region's internal divisions, is therefore an interesting and challenging concept, with implications that go beyond just literature (as when people today speak of "Mindanaoan writing"). Whatever form or shape this attempt at identity formation may take, it illustrates that, in the end, region is just an administrative division or an academic concept unless it represents a "community" that people imagine themselves to be part of, a community that they create and claim for themselves, and out of which they act, write, and speak.

It was commonly thought (and still is) that regionalism is our bane. The statement is reductive. We have been impatient with our coming as a nation that we have been tempted into belief in facile constructs of unity (whether it is the use of a single language or adherence to definitions of nation by a dominant class). We have taken the easier path of leveling and exclusion and have instead reaped the wrath of the excluded. It is not regionalism which

underlies insurgency and separatism but the lack of belief in our pallid constructs of the nation-state.

The social theorist Ernest Gellner (1987) has said that nationalism requires a certain form of amnesia; it requires that we set aside, forget, our identities as clan, tribe, or ethnic group in order to forge the consciousness of being a nation. While this sounds eminently practical, it is also dangerous: what assures speedy mobilization for practical or political ends may also mean a diminution of our substance as a people. Amnesia breeds totalitarianism. It is the richness of memory which we must nourish.

Since the early 1970s, when I first took up an interest in regional studies, much has changed. The regional has come to the fore in discussions of Philippine literature (and culture in general), particularly after 1986 with the interest in decentralization, autonomy, and people empowerment in the post-authoritarian transition. (The organizer of this conference, the National Commission for Culture and the Arts, was a product of this time, with its broadly-based structure of national committees made up of regional and sectoral representatives.) The intellectual shift over the past years is illustrated in the incorporation of the regional in courses on Philippine literature; it is shown as well in the shift in policies of the Komisyon ng Wikang Filipino to a more inclusive, pluralist view of language development. In many cases, the interest in the regional may have been routinized into a case of "preferential option" for the marginalized and excluded; hence it is important we do not grow complacent but must clarify and insist on what is indeed vital and essential in broadening and enriching the base of a national culture.

In any case, many of the stereotypes equating the "regional" with what is localistic and parochial have lost their force. One has only to look at the writers from or in the regions today, particularly among the young—passionately engaged in local languages and traditions, yet also distinctly multilingual, well-read, mobile, wholly at ease and confident in the language or languages they have chosen to write in even as they are effectively plugged into what is going on in the nation and the world.

In a way, the regional can no longer be thought of as marginal. After all, we have a president who is from Davao, and who,

I suspect, would have been happier ruling from Davao than from Manila. But then, again, we also know of course how, given the history and structure of the state, economic, political, and cultural inequalities across the regions continue to characterize our national life. The work of advancing the interests of the region is not done.

{3} We have spoken of the region; what of the writer? What is the utility of the *regional* for writers?

To speak of region is useful for strategic purposes: as a way of instilling a consciousness of location, and the advantages of location; as a way of marking difference, which is an artistic imperative for writers; and a way for mobilizing resources to support creative work by a group or formation of writers.

Location is a writer's comparative advantage. Location can be social and personal rather than simply geographical, such as positions of class or gender and the facts of personal history that make one person different from all others. Yet, a writer's geographic "home" is fundamental. Recognizing that "geography is destiny," as Susan Sontag (2001) puts it, it is important to sharpen one's awareness of the "place" formative of who or what one is, the place out of which one writes, the distinctive resources afforded and stimulated by one's location. Every kind of writing is the product of a specific historical and cultural location.[2] It is this geographically-determined specificity which gives the writer his or her identity as well as a creative edge.

One resource of location is the local language. Each language represents a unique way of looking at and being in the world. Language, after all, is not just language; a whole cultural tradition is tied to it—a people's songs, poetry, tales and myths. Thus, it is true, as one linguist has said, that when a language is lost

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[2] V.S. Naipaul (2007) spoke of the particularity of location in writing. "Certain settings, certain cultures, have to be written about in a certain way. These ways are not interchangeable; you cannot write about Nigerian tribal life as you would write about the English midlands... It is the better and truer part of the labour of a writer from a new place to work out what his material is, to wring substance from the unwritten about and unregarded local scene."

(As an aside, it may seem strange to cite Naipaul in this connection, a writer who—Derek Walcott observed—refuses to be claimed by a country, whether the one where he was born or that where he lives. Yet, precisely for this reason Naipaul, a diasporic writer, part Trinidadian, part Indian, part British, is acutely conscious of the problem of location.)

or extinguished, "it is as if a whole, irreplaceable library has burned down." Of language, however, two things need to be said. While one's native language is an obvious marker of identity or difference, language is not a simple given or simply inherited, it must be learned, deepened, bent, and made one's own. And one should not think in terms of either-or in language use, of chauvinisms of language. There is a value in speaking out of one's home language, but there is value as well in multilingualism and the traffic of languages. That Mindanao has been called a "melting pot" of languages is a testament to the region's linguistic richness and dynamism. These are values that need to be cultivated and preserved. (I was, for instance, in a creative writing workshop here in Davao years ago, and we were discussing texts written in "Cebuano." One participant asked whether one should use Cebuano as it was spoken or written in Cebu as the standard. I replied, *No*, one should use the language as it was used here in Davao.)

A further resource of location is the physical environment. What can we draw from the environment we inhabit that would make of the literature we produce something distinctive? To cite an example, we live in a maritime country, and this is particularly evident in regions like the Visayas, which has been described as a mini-Mediterranean, and places like Southeastern Mindanao and the Sulu archipelago. Yet, I do not think that this fact is evident enough in the literature we produce.

I speak of place not just as a matter of setting and subject matter in our writings but of those qualities that come with living in a maritime world, such qualities as movement, contact and exchange, the porousness of borders, of what is outward rather than inward looking, of what is fluid and hybrid rather than what is settled and sedentary. How are these qualities expressed in our writings?

Finally, there is the resource afforded by local history and tradition. Indigenous poetic and rhetorical forms, for instance, are a source that writers can draw from, as in the example of today's Cebuano poets drawing from the *komposo* and *duplo* in writing poetry that cultivates the values of orality, open-endedness, wit, irreverence (even crassness), direct address, and social comment. We need more examples of the many possibilities in local history and local artistic forms that we have not fully exploited.

These are just examples. What I am suggesting is that we imagine or discover what it is that makes, say, "Mindanaoan writing" different in style, sensibility, and substance from the literatures of, say, the Ilocos region or Central Luzon. This is work that I am sure Mindanao artists and writers themselves are doing but the exciting part is that many possibilities remain. It is on the basis of difference that "Mindanaoan" or "Visayan" would signify a definably distinct and meaningful body of work, rooted in the realities of the region, in active conversation with readers in the region, and one that makes of the national literature itself broader, richer, deeper and more diverse.

Perhaps one more point on the notion of the marginality of regional writers—the literary field indeed remains uneven. For writers, it is important that opportunities, recognition, and rewards be equitably distributed. Yet, it is also important to say that for a writer, in the very heart of writing, the margin is a good place to be in. One of the greatest writers of the twentieth century, the Italian Primo Levi (1989) wrote:

> If one lives in a compact, serried group, as bees and sheep
>   do in the winter,
> there are advantages; one can defend oneself better from
>   the cold and from
> attacks. But someone who lives at the margins of the group,
>   or actually
> isolated, has other advantages; he can leave when he wants
>   to and can get
> a better view of the landscape.

{4} To sum up. To be a writer in a particular region is to have the advantages that writers elsewhere in the country do not have. It means having a particular vantage point from which one can look out into the world; it means knowing a particular landscape intimately deeper than others would; it means having a language, a sensibility, and a style of feeling and thinking that could not but be a product of one's having been formed in a particular place and way of life.

These advantages, however, are not simply given, they must be achieved. The materials for one's fiction or poetry are not simply out there for the taking, one has to recognize them, draw them out,

and work on them. These advantages have to be actualized in the labor of knowledge, imagination, and craft.

I say, *labor of knowledge, imagination, and craft.* Craft is what writers' workshops are about: matters of technique and form. But technique is what one uses to work on one's material, and form is actualized or realized content. What if the material is thin and there is little content? Content is what we build through experience, immersion, study, and research (an undervalued aspect of the writing life). It is knowledge that, by the act of the imagination, we process for the meanings and possibilities that others and we ourselves have not quite seen.

One does not possess a place by just living in it but *by* and *through* the work of knowledge, imagination, and craft.

May all of us be blessed with such gifts.

References

Gellner, E. (1987). "Nationalism and the Two Forms of Cohesion in Complex Societies," *Culture, Identity, and Politics*. Cambridge University Press.

Levi, P. (1989). *Other People's Trades*, trans. R. Rosenthal. Summit Books.

Mojares, R. B. (1976). "On Native Grounds: The Significance of Regional Literature," *Literature and Society: Cross-Cultural Perspectives*, ed. R.J. Bresnahan. United States Information Serviosuce.

Mojares, R. B. (1990). "Imagining Regions," *Handurawan: Antolohiya ng ma Tula ng mga Tumanggap ng CCP Literature Grants, 1988-1989.* Sentrong Pangkultura ng Pilipinas.

Naipaul, V. S. (2007). *A Writer's People: Ways of Looking and Feeling.* Picador.

Sontag, S. (2001). "Danilo Kis," *Where the Stress Falls: Essays*. Picador.

Prospects of Including Indigenous People in Urban Area Development Towards Sustainable Regional Development in New Clark City, Philippines: Documenting the Processes

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ABSTRACT

This paper documents the processes involved in the government's endeavor to achieve inclusive and sustainable development in an ambitious urban development project that will decongest Metro Manila, and save it from the threats of a mega-quake and rising sea-levels. In particular, it looks at the ways the project includes the Aytas, the Indigenous People around the development area, in the enjoyment of the benefits of the undertaking via what are claimed to be inclusive development approaches: providing them 1) culturally-appropriate education and 2) a central role in biodiversity development since the Aytas have much to contribute toward the enrichment of botanical knowledge around the fragile Mt. Pinatubo area. A reflexive ethnographic research, the paper looks at the relations between the state as an urban developer and the Indigenous People (IP) and argues that the role of supportive institutions serves as a strong force in the continuity of the presence of the Indigenous People in our midst, hence, preventing their disappearance or cultural annihilation through forcible assimilation. Moreover, disempowered IP groups like the Aytas assert state recognition of their cultural identity, heritage, and ancestral domain with the strong advocacy of cultural development workers and militant organizations.

Keywords: area development, philosophy of space, culturally-appropriate education

INTRODUCTION

Cultural and Environmental Sustainability in Regional Development

This paper aims to contribute to the discourse on the marriage of culture and regional development, particularly the idea that describes area development as a project on spaces infused by the cultural perspective of space users that promote environmental sustainability (Van der Borg & Russo, 2005; Sheppard, 2018). In the heat of commercialization, threats of climate change, and congestion, it is to the benefit of the regional development project to plan a sustainable way of integrating cultural values protective of the environment in its philosophy of space.

The cultural perspective tackled here is that of the Indigenous People (IP), in particular, the Pinatubo Aytas in Central Luzon, Philippines. This IP group generally believes that the spirits of their gods live in forests and mountains, in rivers and seas, and in the skies, and hence should be respected lest the spirits be offended and punish those who desecrate everything in them. Desecration includes the indiscriminate cutting of trees and polluting the waters and skies. It is this cosmic view of nature that is worthy to be embodied in the principles of sustainability for regional development areas. As this cultural perspective is considered in area development, so too, must the culture bearers—they and their culture should be kept alive and made to infuse the way of life in new cities.

In the Philippines, the support of institutions and cultural advocates has been instrumental in helping prevent Indigenous People from vanishing or fully assimilating, hence assuring cultural sustainability that is good for environmental sustainability. Throsby (2001) theorizes that like the concept of environmental sustainability that posits that development is undertaken in a manner that production and consumption of natural resources take into account the welfare and needs not only of the present but also of future generations, the idea of cultural sustainability promotes the continuity of way of life that is anchored on the health of the eco-system for the benefit of future generations.

The assertion that the assistance of institutions and advocates (such as the University of the Philippines, cultural workers within and outside government, various non-government institutions and the media), is crucial in helping keep alive the way of life of Indigenous Peoples (such as in the case of the Pinatubo Aytas in Central Luzon, Philippines) contrasts with the notion that it is the Indigenous People themselves who autonomously act on their own to retain their way of life as suggested by Champagne (2008):

> Throughout the world, indigenous peoples make similar efforts to retain culture, self-government, economic and political autonomy, and face similar issues of negotiating their claims with nation-states and in a world of increasingly globalized markets, culture, and information. Instead of vanishing away or assimilating, indigenous peoples propose to meet contemporary challenges from within their own cultures, communities, and with their own political interests and cultural values. Indigenous peoples are here to stay. Consequently, new ways of theorizing about indigenous peoples, and new policies and practices for undertaking relations with indigenous peoples are needed. p. 2

In the case of the Pinatubo Aytas, they have always been assisted by their defenders. This is given the fact that many Aytas, especially the younger generation, have imbibed the culture of the mainstream population, thanks to the unified educational system and the impact of modern technology and communication. On the impact of technology, Fox (1953) noted for instance that when the Aytas discovered the use of the guns left by the Americans in the mountain, they learned how to hunt alone. Hunting alone using a gun is an efficient way to catch animals for food but an abandonment of the collective practice of hunting in bands. In the process of this and other forms of cultural onslaught, their defenders, as earlier mentioned, have stepped in to help prevent the total annihilation of their way of life. The most important and far-reaching victory of the defenders was the passage of the Indigenous Peoples Rights Act (IPRA) in 1997 or Republic Act 8371, which benefited not only the Aytas but all the Indigenous Peoples in the Philippines. The implementation of this law has been attended by problems arising from inconsistencies with the Philippine Constitution and civil law. The Philippine Constitution recognizes the doctrine of *jura regalia*,

which means that all lands of the public domain belong to the state. In addition, the nature of ownership in ancestral domains—private but communal community property, but the IPs in the ancestral domain are not co-owners in the sense that the lands cannot be sold, disposed of, or destroyed—conflicts with the concept of ownership in the New Civil Code. Nevertheless, IPRA opened avenues for the protection and development of Indigenous culture in the country, the realization of which, the defenders of Indigenous Peoples have always been strong advocates.

This paper looks at the impact of the continued advocacies for the recognition of the rights of the Indigenous People in Central Luzon, particularly the Aytas, against the backdrop of the transformation of an area used by the Americans as a former military base into a major area development project called the New Clark City (NCC). It posits that this particular group of Indigenous People around the Mt. Pinatubo area is able to gain recognition of their cultural identity, heritage, and land through actions, notably by non-government organizations (NGOs), academe, media and cultural workers within and outside government, who have mobilized to support them.

The process of defending the Aytas by various entities has a two-fold aim—social justice and the protection and development of their cultural heritage for the sustainability of their environment and livelihood and beyond. Because the Aytas keep on moving for economic and cultural reasons, it is difficult to ascertain their legal places of residence. If they could help it, their world would be open-access spaces which they could leave when a relative dies or when the soil has become overused and then return to when the spirits allow or the soil becomes fit for cultivation again. But the spaces and resources are getting scarcer as the population and needs of society increase. As population increases and competition for land gets tight, there comes a pressure to the state to readjust distribution. And then too, in the age of turbulence, the state has to plan and prepare spaces to save lives, property, and national wealth. But it must nevertheless, ensure social protection for those who are affected by the ensuing reallocation of resources.

As a result of advocacies for social justice for the Aytas and other Indigenous Peoples, their claims for permanent spaces where they could live their way of life have been recognized in several ancestral domain areas in Central Luzon. Those who have been granted

Certificate of Ancestral Domain Titles (CADTs) could work their areas—in the range of 2 to 20 hectares per household if the total land area per CADT in Central Luzon is divided by the number of household beneficiaries—for food production and other uses. These spaces are huge areas, considering that many Filipinos are landless and even homeless. And that before the Spaniards colonized the Philippines, prehistoric natives of the archipelago were all Indigenous Peoples.

The philosophy of the Aytas on their relationship with nature is an appropriate philosophy of space for the environmental sustainability of the NCC and the regional community. Hence, it is a good area development policy to encourage the contributions of the Aytas to the regional community and to support them in this endeavor. I believe that such support will go a long way if provided within a designated area in the NCC through an appropriate education and skills development cum livelihood assistance using the Aytas' Indigenous and Traditional Knowledge (ITK) on ethno-botany.

BACKGROUND

Impetus for New Clark City as Major Area Development

In the Philippines, an ambitious 9,450-hectare area development project has been named by the current administration of President Rodrigo Duterte as New Clark City (NCC) and called Clark Green City during the administration of President Benigno Aquino. New Clark City lies at the extended part of Clark Freeport Zone (CFZ) towards the north, until the town of Capas, Tarlac, and is called the Clark sub-zone (see Figure 1 below for the map of the NCC side by side with the officially registered ancestral domain of the Aytas in Tarlac and Pampanga).

After the departure of the Americans in 1991 following the rejection by the Philippine Senate of the extended operation of the United States military facilities in the Philippines, the government created the Bases Conversion Development Authority (BCDA) with the mandate to convert such military reservations into other productive uses under Republic Act 7227. The latest of this conversion endeavor is the NCC.

The purposes of this latest major area development are to decongest Metro Manila, to disperse development to the countryside, and to secure at-risk populations from possible disasters like the projected "Big One" (strong earthquake) and the effects of climate change. Today, Manila is considered the densest city in the world. Wright (2020) puts Manila's population density at about 46, 178 people per square kilometer (PPSK); Pateros, which has 36, 477 PPSK comes as the second densest; and Mandaluyong, with 34, 925 PPSK, is the third. All three are in the National Capital Region. Baghdad, the Iraqi capital, with 32,874 PPSK is the fourth densest city in the world (Wright, 2020).
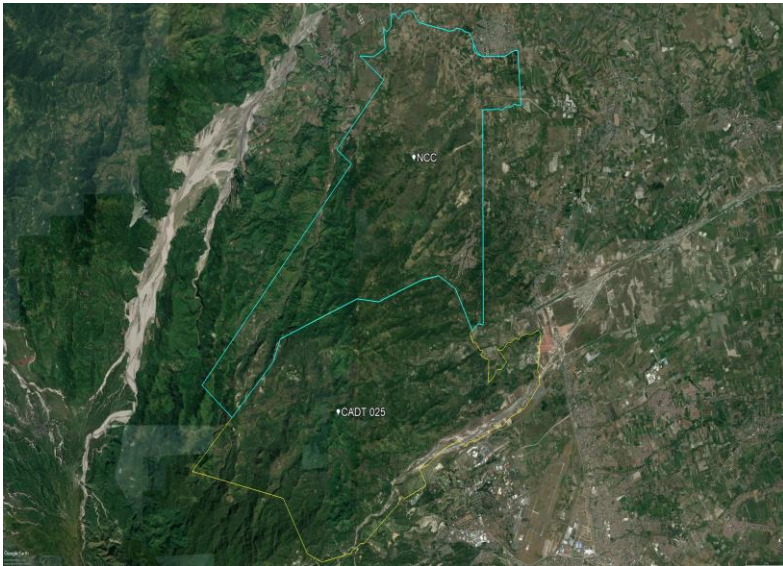
Figure 1. Map of the New Clark City beside the ancestral domain of the Aytas in the villages of San Nicolas, San Vicente, Sto. Niño, Anupul and Calumpang in Bamban, Tarlac and parts of Barangay Marcos in Mabalacat, Pampanga, under CADT RO3-BAM-1204-025

Metro Manila, the National Capital Region (NCR) of the Philippines, is seeking to disperse development to other regions by encouraging the transfer of investments through incentives in infrastructure such as transportation and communication facilities, and boosting

existing regional natural resource endowments. Regional dispersal of population and industries has always been a part of the regional development strategy of the Philippine government, starting from the creation of regional offices of the national government in the early 1970s as mandated by PD 1177.

As the seat of government and center of power for centuries since the arrival of the Spaniards in the 1500s, Manila and its neighboring cities, which now comprise the region called Metro Manila (MM) or NCR, have enjoyed priority both in the allocation of resources and in the determination of regional wages. These two factors have led to the migration to MM by rural workers and the influx of country population from other regions to the metropolis for education, work, and residence.

Aside from the density problem, Metro Manila is threatened by the prediction of a major earthquake. According to the Department of Science and Technology - Philippine Institute of Volcanology and Seismology (DOST-PHIVOLCS), the "Big One", an earthquake with a magnitude of no less than 7.2 on the Richter scale, may be experienced in our lifetime. The affected areas are those near the West Valley Fault (WVF), an active fault system consisting of two fault segments and located underground, moving where a big earthquake may originate. The two fault segments are the 10-km long East Valley Fault (EVF) in Rizal and the 100 km long WVF that runs through Bulacan, Rizal, Metro Manila, Cavite, and Laguna (NRCP, 2017). The Big One poses a threat to people, livelihood, buildings, and infrastructure.

Lastly, Metro Manila is also threatened by a possible sea-level rise resulting from climate change, according to the 2017 study of the Asian Development Bank and Potsdam Institute for Climate Impact Research. The study predicts that by 2085, the Philippine cities of Butuan, Davao, Iloilo, Caloocan, Malabon, Manila and Taguig, having low-lying coastal areas, will be at increased risk of flooding. Together, these imperatives compelled the creation of the NCC.

In an earlier study that I conducted for the Department of Agriculture Bureau of Agricultural Research (DA-BAR), I was tasked to assess the climate information system (CIS) that was set up by the non-government organization Rice Watch Action Network (RWAN) and similar systems established by the DA and other institutions in

selected parts of the country. I observed that some of the places where the NGO set up the CIS were coastal high-risk agricultural and fishery areas that have actually suffered severe flooding that displaced the farming and fishing population in the recent past (Sebastian, 2018). In that study, I recommended contingency planning for the preparation of the relocation of the said population in anticipation of the predicted sea-level rising. It was my belief, and still is, that localities elsewhere should be ready and sincere to offer spaces to Filipinos who would be adversely affected by the possible submersion of coastal areas in the event that the prediction finally visits our land. It is in this spirit that I welcome the intent of NCC to offer succor to Filipinos who would want to relocate to the area regardless of their regional origins. Metro Manila hosted Filipinos from other regions who migrated to the metropolis for work, residence, education and other purposes for decades and in the process bore the undesirable consequences of urbanization. Should not other regions welcome their countrymates when their turn comes?

The Aytas

The Aytas in the Philippines, generally short, dark brown-skinned, and curly to kinky haired, were called Negrillos by the Spaniards when the latter were here from the 16th to 19th century. They refer to themselves as Ayta, Ita, Agta, Ati, Ateng, and Mamanwa depending on their geographical location. They refused to be settled in reducciones all throughout the Spanish rule. Reducciones was the Spanish policy of resettling dispersed Filipinos into compact settlements to facilitate governance. The natives were resettled "bajo de campana" or within the sound of the church bells. Chirino (1604, 12:209) related how this resettlement proceeded in Taitai (now Taytay, Rizal). After observing the flooding of the valley— from the "banks of the marsh of stream formed by waterfalls from the mountains of Antipolo" —where the old settlement was located, Chirino caused the transfer of houses to an elevated place where the barangai folks or resettled villagers could attend mass in the church which he said the natives also built with surprising haste. The Spaniards also had difficulty in converting the Aytas to Christianity because, as Chirino observed, the latter feared and mistrusted them. Comparing the Pintados and the Negrillos in the Visayas (Bissayas).

Chirino (12:217) described the latter:

> These blacks have had very little to do with the Spaniards, not so much through hate as from fear and mistrust of them. It has already happened that Spaniards, unaccompanied and straying from the road, have fallen into their hands; but with a few presents and fair words they have been allowed to go free. They also fear the priests as being Spaniards, making no distinction between them. For this reason we could not undertake their conversion, although they were near to the village of Tigbauan; on this account all our energy was directed towards the Bissayas alone.

The Pinatubo Aytas are the Indigenous People around the Mt. Pinatubo area. In the early years of the passage of the IPRA, I asked a DENR officer how large the ancestral domain claims of the Aytas were. He said that those who were helping the Aytas (various NGOs whose group name he did not mention) claimed that the Aytas owned the area 30 kilometers from all points of the foot of Mt. Pinatubo onwards, hence, effectively covering the whole of Clark main zone and parts of the sub-zones, the whole of Angeles City and Mabalacat City up to parts of San Fernando City, Pampanga, parts of Zambales, Bataan, and Tarlac provinces. If such claim is to be taken seriously, where would the non-Ayta population of these provinces go? Where would they trace their ancestries so that they could in turn claim their own lands in which to live, work, and reproduce their kind? The claim taught by those who help the Ayta defenders whom the DENR officer was referring to seems inconsistent with the practices of the Aytas because the latter could not have conceived of "owning" lands prior to their introduction to the concept of ancestral domains. They roamed in forests in lowlands and uplands, treating the whole area as a commons or an open-access area. Moreover, "Territorial boundaries were never defined by the Aetas in terms of concrete boundaries… this is based on their consciousness and is defined by the use of markers such as fruit trees and natural demarcations such as rivers and ridges, whatever is present in the area" (David, 2011).

Rightly considered, all Filipinos were Indigenous People when the Spaniards came. And hence, the practice of land ownership in pre-historic time should be the basis of land allocation to all Filipinos in the post-colonial era. In my dissertation titled "Getting Beyond the

Commons Dilemma in Community-Based Forest Management in Central Luzon, Philippines: An Autoethnography", I traced such land ownership practice from the Spanish chronicler Plasencia (1589). Talking about the customs of the Tagalogs, Plasencia described land ownership in the country during the 16th century—both individual and common as follows:

> The lands which they inhabited were divided among the whole barangay, especially the irrigated portion, and thus each one knew his own. No one belonging to another barangay would cultivate them unless after purchase or inheritance. The lands on the *tingues,* or mountain-ridges, are not divided, but owned in common by the barangay. Consequently, at the time of the rice harvest, any individual of any particular barangay, although he may have come from some other village, if he commences to clear any land may sow it, and no one can compel him to abandon it (P.166).

The coverage today of the mentioned claim of 30 kilometers from all radii of the foot of Mt. Pinatubo extends to the areas that have been inhabited by the non-Ayta Kapampangans, Zambaleños, Tarlaqueños, and Bataaños for centuries. If the practice of the prehistoric Filipinos on land ownership should be the basis of land reform, it would be unjust to say that only the Aytas should own such land coverage. It is even interesting to note in the description of Plasencia that prehistoric Filipinos were unselfish as they would allow those from other villages who have commenced to clear any land to sow it, and not "compel him to abandon it."

Agrarian justice was introduced from the 1950s land reform program and modified from then up to the present through the Comprehensive Agrarian Reform Program (CARP). CARP's counterpart for the Indigenous People is the Indigenous People's Rights Act (IPRA) which mandates the granting of certificates of ancestral domain titles (CADT) to qualified claimants.

Awarding of Certificates of Ancestral Domain Titles
After the approval of the IPRA Law in 1997, the filing and processing of the Ancestral Domains Claims of Indigenous Peoples in the country commenced. In May 2009, President Gloria Macapagal-Arroyo awarded the first four CADTs to be registered out of the 29

CADTs in the country (Orejas, 2009a). The first IP awardees were four Ayta groups in Central Luzon, namely:

1) Aytas in Pastolan in **Hermosa, Bataan,** who were awarded CADT RO3-HER-0703-008 that covered 4,284.13 hectares of lands and 13.7 hectares of waters;

2) Aytas in Barangay (or villages) Nabuklod and Mawakat in **Floridablanca, Pampanga**, and portions of San Marcelino and Subic towns in **Zambales** who were awarded CADT RO3-FLO-1206-057 that covered 5,496.82 hectares of lands. The CADT was awarded to 454 Ayta families.

3) Dumagats in Barangay Dibut in **San Luis** and in portions of Barangay Zabali and Pingit in **Baler, both in Aurora**, who were awarded under CADT RO3-SLU-1205-039 that covered 2,789.26 hectares of lands and 2,859 hectares of waters; and

4) Aytas in the villages of San Nicolas, San Vicente, Sto. Niño, Anupul and Calumpang in **Bamban, Tarlac** and parts of Barangay Marcos in **Mabalacat, Pampanga**, under CADT RO3-BAM-1204-025, who were awarded lands that were the biggest among the four— 10,323.308 hectares. The CADT was awarded to 3,000 families in the mentioned areas.

Other CADTs Awarded to Aytas of Central Luzon

Mt. Pinatubo, Botolan, Cabangan, San Felipe, and San Marcelino, Zambales. On November 9, 2009, the 7,000 families of Mt. Pinatubo Aytas became official owners of the lands around the volcano where they used to reside before the eruption and where they returned to five years after (Orejas, 2009b). CADT RO-3 bot-0708-073 issued on November 9, 2009 sealed the ownership of lands that spanned the villages of Burgos, Villar, Moraza and portions of the towns of Cabangan, San Felipe, and San Marcelino. The CADT covered 15,998 hectares including the 3-km Mt Pinatubo wide crater lake (Orejas, 2009b).

Cabangan, Zambales. The Aytas known as Abellen of Sitio Maporac, Barangay New San Juan, Cabangan, Zambales, received the Philippine's first Certificate of Ancestral Domain Claim (CADC) on

March 8, 1996. They acquired their CADT 16 years later in December 2010.

The CADT award had a total area of 5,430 hectares covered by CADT No. R03-CAB-0110-151 with 2,685 hectares or 49% of the total area as an open canopy forest. The ancestral domain of the Ayta Abellen forms part of one of the Key Biodiversity Areas in the Philippines—the Zambales Mt. Range.

"The Ayta Abellen community is composed of around 186 households or 934 individuals in several settlements. Majority of them settled in Sitio Maporac in Barangay New San Juan while some have established settlements in Sitio Tangos, Barangay Dolores and Barangay Casabaan of the same municipality. Of the total number of households, 26 of them are migrants or non-indigenous peoples." (ICCA Registry, March 2013).

Morong, Bataan. The CADT application of the Ayta Magbukun ICCs/IPs in Sitio Kanawan, Brgy. Binaritan, Municipality of Morong, Province of Bataan, was approved on the third and final reading by the NCIP Seventh Commission during its en banc session conducted on June 19, 2018 (NCIP, 2018).

San Jose, Tarlac. In 2018, the NCIP reported that the delineation of the CADT of the Ayta Abellen ICCs/IPs in Brgy. Maamot, Municipality of San Jose, Tarlac was ongoing (NCIP, 2018).

I compute that if each group of the abovementioned CADT recipients would allocate the lands to the members, the resulting distribution would range from 2.28 to 20.19 hectares per family (I did the computation for those with available data on the number of recipient families only).

Considering that many Filipinos are landless or own only the small lots where their houses are erected, and the very poor are even homeless, the Ayta groups mentioned above, who have been awarded permanent ownership of their ancestral domain, are far better off. Even middle-class Filipinos own tiny parcels of land only, like some 150 to 300-square meter lots where their houses are erected. They plant vegetables and ornamentals in the two-meter easement around their houses or do vertical gardening in terraces if the house fully occupies the lot.

How the Aytas would make use of their common property in their ancestral domains for their cooperative and individual purposes would determine the sustainability of both their environment and culture.

The Indigenous/Traditional Knowledge of the Aytas Towards Area and Environmental Sustainability

Robert Fox (1953), in his study titled *The Pinatubo Negritos: Their Useful Plants and Material Culture,* gave an account of the ethno-botanical knowledge of the Pinatubo Aytas. He observed not only their familiarity with both native plants and those that were introduced from the New World "by man" but also the relationship of such plants with animals and insects. This relationship was important because they could trace the behavior of the animals who frequently visit specific plants for food. Hence, even if they do not eat the fruits of some trees, these are important to them as markers of the location of animals and insects. Fox likewise observed the botanical knowledge of Ayta "medicine men and women" or the *mananambal*. He also listed the various uses of plants by the Aytas not only for food and medicine, but also for other domestic uses such as for shelter, weapons, adornment, clothing, and utensils.

 There are areas of the forests and trees that the Aytas would not touch because spirits—either good or evil— live in them. They would leave a place either because a relative dies or the soil has become overused and then come back when the spirits allow or the soil becomes fit for cultivation again. Such intimate knowledge of, and relation with, the forest eco-system is the Aytas' Indigenous and traditional knowledge.

METHODOLOGY

This study focuses on a project, the proposed Ayta Ethno-Botanical School (AEBS) inside the NCC. This school would be part of the overall concept of the BCDA to preserve Indigenous communities and the heritage of the IPs in Central Luzon and to include their concept of environmental protection in the philosophy of sEMMapace of the new city. In this narration, I use reflexive

ethnography for this case study on the infusion of Indigenous culture in area development efforts.

Subject Position. My participation in the whole area development project started in 2013 from the writing of the rapid assessment of the site for the new city. The rapid assessment included an inventory of those who populated the area, both Aytas and non-Aytas—their regional and provincial origins, socio-economic status, their expectations, and what they thought about the project. After the completion of the writing of the rapid assessment in 2014, I went back in 2019 to the BCDA, my partner in reviewing a curriculum for Ayta schools with an Alternative Learning System (ALS) based on the knowledge systems and practices of the Aytas. This curriculum was the product of an earlier action research project of the University of the Philippines Diliman Extension Program in Pampanga (UPDEPP) in collaboration with a campus-based cooperative.

I thought that the curriculum, having been developed in a community-based forest management area in Zambales with mixed Aytas and non-Aytas as forest stewards, would be useful for the ethno-botanical school I recommended in the mentioned rapid assessment report on the NCC area in 2013.

The intimate knowledge of the Aytas of their ecology, as discussed in the preceding section, is important in keeping the biodiversity in the forest ecosystem. As the NCC is surrounded by upland forests, the health of the forest ecosystem would be vital in the life of the area as it proceeds to become a sustainable city. As this city of the future would have increasing need for water and clean air, the rehabilitation, protection, and development of the forests around Mt. Pinatubo is an important component of a forward-looking plan. This is essential in the sustainability of the NCC environment and beyond. Hence, while the new city would be populated by locators who would rent spaces from the government, it is wise for the BCDA to keep the Aytas who settled in the area as keepers of the forest environment.

Below is the documentation of the transition from the rapid assessment of the area to the consideration and planning of the Ayta Ethno-Botanical School, which would utilize the forest curriculum.

DOCUMENTING THE PROCESS OF THE INCLUSION OF THE AYTAS IN THE NCC

Pre-development Stage, 2013-2014

In 2013, acting by virtue of its mandate to convert former US military facilities into development hubs, the BCDA started the New Clark City project by conducting a rapid assessment of the state of the government property. The rapid assessment included a survey of the Ayta and non-Ayta households that settled in this land. It found out that in the 9,450-hectare government property, there were around 2,000 households of mixed regional origins in four barangays who settled in the area for development. The number of Ayta households was indeterminate because they would leave and come back to the area as is characteristic of their cultural lifestyle. Since their housing make was susceptible to destruction, the accurate number of their households was difficult to ascertain. This means that the survey group found no actual Ayta houses built in parts of the surveyed areas but in the statistical sample, the survey doubled the number of the representation of the Ayta households because their houses might have been blown away, or they might have moved somewhere else.

Hence, during the survey of the estimated 2,000 households in the area, 27 Ayta households were included, a number that gave them fair chances to be represented out of the total 132-survey sample of household respondents. The rapid assessment report says:

> A total of 132 respondents—representing 6.3% of the estimated number of households in the affected barangays—were surveyed. The barangay captains estimated the households in each barangay to be approximately 500 or a total of 2,000 households in four barangays. The survey approach was to mark every fifth house from a beginning point of the area. This would prevent the owner of the marked house from being interviewed again in the next batch of the survey. To allow the Ayta population fair chances to be represented in the survey as their sitios were in the remote areas, 27 of them coming from Sitio Manabayukan of Barangay O'Donnell were included in the survey, hence doubling the O'Donnell's representation in the total number of respondents.

This allowance for the Aytas was also made in consideration of the fact that in practice, they leave and come back to the community in the exigency of their economic and cultural practices. Moreover, their housing make was susceptible to destruction by the vagaries of nature and hence the accurate number of their households was indeterminable. Still, the representation of the Aytas (53 or 40%) in the survey was still lower than those of the Non-Aytas (79 or 60%). (Sebastian, 2014)

To assess the views of the Capas local government unit's planning and development staff, and of the sectoral and barangay leaders about the then named Clark Green City project, and to know the stakeholders' concerns, expectations, and claims, a focus group discussion (FGD) was conducted by the BCDA project development team called BCDA-Project Management Office for Clark Green City (BCDA-PMO-CGC).

The Aytas, the Indigenous People in Capas, were represented at the FGD by Program Margarita (PM), one of the nongovernment organizations (NGOs) assisting them. Prior to the FGD, the BCDA-PMO-CGC conducted onsite consultations at the sitios of the Aytas. The BCDA assessment group presented the project and asked the Aytas their concerns and what they thought about the project. The Aytas said they needed livelihood and accessible education for their children. The BCDA assessment team then asked who among their leaders could represent them during the multi-sectoral consultations to be conducted in Capas poblacion. The Aytas said Program Margarita could represent them. Hence, during the multi-sectoral consultations, PM was invited together with some Ayta leaders. The NGO expressed the need of the Aytas for higher education in a place close to their sitios and welcomed the proposed Center of Excellence in the Green City. The PM representative also appealed on behalf of the Aytas for training in livelihood and health management.

As the BCDA-PMO-CGC consultant on this rapid assessment, I informed the NGO representative of an alternative learning system (ALS) curriculum for Aytas managing common forest resource, which I developed as part of an action research in the University of the Philippines. When this ALS curriculum was developed in 2007-2008, IPRA was still young and the lands today covered by ancestral

domain titles were still under the program of the DENR called Community-Based Forest Management (CBFM) with management contracts awarded to people's organizations (POs), constituting Indigenous Peoples or mixed IPs and non-IPs. Moreover, the then Bureau of Alternative Learning System (BALS) of the Department of Education, which was later abolished, had not yet produced similar education and training materials for Indigenous Peoples. The Department of Education, as of this writing, is still in the process of developing location-and-tribe-specific curricula. The people's organizations managing the CBFM areas were, in the CBFM contract with the DENR, encouraged to nurture the awarded forestlands towards the holistic development of the community of the forest managers. The ALS curriculum was developed in the spirit of providing education and training tailored for Ayta forest managers because during that time, both IPs and non-IPs received education designed for the mainstream population. The action research was undertaken in a community-based forest management area in Zambales in consultation with the Aytas residing in the mixed settlement of Aytas and non-Aytas dispersed by the Mt. Pinatubo eruption. As in many CBFM areas in the country, the forestlands under the program were in need of rehabilitation, development, and protection (Sebastian, 2008). The Philippine forests were no longer as affluent as they were when the Spaniards arrived in the 1500s. Over the years, the forests have suffered from logging and extraction of mineral resources beyond their carrying capacity, from forest-fire causing livelihood activities to the eruption of Mt. Pinatubo in 1991 in Central Luzon. Hence, the need for all CBFM beneficiaries (both IPs and non-IPs) to help restore the health of the forests.

The action research likewise developed exemplar lesson plans or alternative learning system modules appropriate for the needs of the Aytas in the context of the conditions of the upland forest eco-system in the twenty first century and the need for the IPs to protect their Indigenous and traditional knowledge as the Philippines joined the global economy. Hence, the curriculum included activities for agro-forestry-based livelihood (e.g. diversification of livelihood in order to lessen or totally abandon forest-fire causing charcoal making), health and sanitation management, processing of the useful plants of Pinatubo Aytas (in case they opt to supply other communities with their products or exchange such with those of other communities as many of them have already been doing), and information on or aspects of social processes they may need to know

as they interact with the people outside their communities. These processes include participation in elections, exchange of their products with those of others outside their communities, negotiation arising from the management of their common-property resource, and protection of their traditional/Indigenous knowledge.

The BCDA contingent stated that the curriculum would be useful for the Aytas in the affected areas and may be considered for the Corporate Social Responsibility (CSR) program of the BCDA. In the abovementioned rapid assessment report, I wrote that the following was recommended in response to the request of the Aytas for accessible education in the new city:

> As part of the future ecological-cultural tourism area, the Ayta school areas could be developed as an Ethno-Botanical Garden in which the Aytas themselves could plant and be given maintenance responsibilities.
>
> Further, hawong-inspired learning facilities would be built by the Aytas assisted by architects and engineers to ensure that the structures are weather resistant. These structures could be patterned after the Indigenous houses of the Aytas but fortified with concrete materials so they would not need to rebuild after every disaster. Both the ethno-botanical garden and the hawong learning facilities could become part of the ecological-cultural tourism of the place under an agreement with the community. The University of the Philippines in Clark could put up within the ethno-botanical garden an Ayta Studies Center cum Ayta Museum. The Ayta Museum could be designed as a big hawong although the whole ethno-botanical garden itself could serve as a museum. Hence, the theAytas could continue to live where they have settled in the government property, preserve their culture, and protect the forest environment. (Sebastian, 2014)

As would be clearer in the latter portion of this paper, these suggested structures would be discussed at length with the Aytas during the joint efforts of developing the competencies of the curriculum for Ayta education and during the conduct of the social preparation activities for the development of the Ayta Ethno-Botanical School.

Development Stage, 2016 to 2020

Prior to the commencement of physical development in the NCC, the BCDA negotiated with the project-affected population (PAP), meaning those who built houses and business structures in and used the future NCC area for farming and other business ventures. The agency gave them financial assistance in the amount of three hundred thousand pesos ($6,000 more or less, based on the foreign exchange value of the peso at the time the assistance was given) per hectare of land claimed to have been used.

On the part of the Aytas, their militant defenders protested that the NCC deprived the Aytas of their ancestral lands (Subingsubing & Ramos, 2019). The BCDA explained that since the NCC area was classified government property, there were no IP ancestral domains within the area. The local chief executive of Capas, Tarlac and a former member of the National Commission on Indigenous Peoples attested to the veracity of the declaration of the BCDA (Manabat, 2019). NCIP Region 3 issued a statement asserting that "There are no declared ancestral domains or Certificates of Ancestral Domain Titles (CADT) in the area. Therefore, Aeta communities are not displaced." (NCIP, 2019)

THE AYTA ETHNO-BOTANICAL SCHOOL

Consultations on the Ayta Curriculum and the Establishment of the Physical Structures of the Ayta Ethno-Botanical School

At present, the implementation of the proposal on the inclusion of a cultural space for the Aytas within the New Clark City is underway. In consultation with Ayta teachers and their community elders/leaders, the design of an Ayta Ethno-Botanical School (AEBS) is in the process of development. The consultation process is a part of the review of the curriculum for the learning system for the Aytas within the NCC as well as the plan of the BCDA to preserve the Ayta communities. The first part of the review of the curriculum has been completed. Involved in the review are: two licensed Ayta teachers, the Department of Education Region 3 Focal Person for Indigenous People's Education, and an expert on the alternative learning system from the UP College of Education. The second part of the review is the development of the competencies required in the

implementation of the curriculum process as suggested by the curriculum review group members mentioned. This second review was supposed to be undertaken in the second half of this year, 2020, but the COVID-19 pandemic halted the implementation of the planned activities as physical meetings could not be conducted in observance of the physical distancing rules of Bayanihan Law 1 and 2, and the Aytas in remote parts of Capas could not participate in online meetings.

A 10-hectare lot has been initially allocated for this learning facility where botanical knowledge and other expressions of culture of the Aytas will be highlighted. Hence, in AEBS, an area is devoted to the planting of forest and fruit trees interspersed with vegetable, medicinal, and other plants. The forest garden is called Museum of Ayta Botanical Knowledge. Two hectares are being planned to be allocated to the development of open-air learning facilities appropriate for the cultural learning norms of the Aytas. Included in the two hectares is a processing center where the Aytas could be taught to process their useful plants, and a display room for processed products.

Consultations with the Aytas and other reviewers of the curriculum have been undertaken under the purview of the BCDA Office of the Vice President for Conversion and Development Group headed by Engr. Joshua Bincang and BCDA Community Relations Office (COMREL) led by Jennifer Mallo. The BCDA fully welcomes the idea of the AEBS and is especially interested in the sustainability of its operation. Hence, following the instructions of the Vice President for Conversion and Development, I am preparing an action plan for the next ten years.

It is noteworthy how the BCDA, through the mentioned offices, have been keen about and welcoming of the idea of the AEBS. The agency even allowed the COMREL head to join me in presenting the early version of this paper at the London Regional Studies Association Winter Conference in November 2019 with the theme "Turbulent Times: Rethinking Regions and Cities". The agency supported in both the logistics of my consultations with the Aytas on the review of the curriculum and in scouting for engineers, landscape architects, and social entrepreneurs who could be involved in the development of the AEBS. Through the COMREL, sourcing financial assistance for the development of the area and for the establishment

of the school has been initiated. Both the past—(President Benigno Aquino's)—and present —(President Rodrigo Duterte's)—administrations are supportive of the AEBS idea. Their chief executive officers (CEOs) in the BCDA, Arnel Paciano Casanova and Vivencio Dizon, respectively, posed no objections. In 2013, I presented the results of the rapid assessment of the then Clark Green City area to lawyer and past BCDA president Arnel Paciano Casanova. The assessment included the recommendation to create an AEBS among others, which would blend quite perfectly with the concept of a "green city". From 2018 to the present, development economist and current BCDA president Vivencio Dizon, together with his agency's mentioned offices, approves of what I am doing with the AEBS.

Learning while Earning

The target Ayta learners in the ethno-botanical school are those of working age who have not yet finished elementary or high school in the formal educational system. The proposed learners are Aytas of working age so that they may earn while they learn. This is to ensure that the learners would not disrupt their studies whenever their families need them to work to provide their basic needs. Dropping out from school because of the need to help their families is a common problem of Ayta children. This problem was observed during the development of the Ayta curriculum that would be used for the school—in the literacy class conducted which also served as the laboratory for the development of the curriculum.

Recapturing the Indigenous Way of Life

As many young Aytas have partly imbibed the life of the mainstream population and received the same education provided by the public school system to the rest of the Philippine population, they do not fully know their heritage anymore. They will therefore be taught by professional Ayta teachers as well as by elders in their community who are bearers of Ayta culture.

The curriculum exemplar lesson plans are divided into three parts. First, the curriculum material is designed for the Aytas to know themselves in the context of their environment and develop the skills their ancestors mastered, such as survival in the forest and making use of plants for food, medicine, and other applications.

Their elders will be the teachers of their Indigenous and traditional knowledge. Second, they will also be taught to understand the communities outside them. And third, they would be taught to grasp the world beyond with topics that include world geography, the Indigenous and traditional knowledge of IP groups in the world, their livelihood products, their technology, and how they are protected. The teachers will be professional Ayta teachers as well as non-Aytas trained in Indigenous Peoples education.

At present, the University of the Philippines Diliman Extension Program in Pampanga (UPDEPP), currently situated in Clark Main Zone, is preparing a short-term seminar-workshop to co-study with the Ayta teachers on IP Education. This course for teacher training is a must in order to make available teachers who will provide the young Aytas culturally-appropriate education. UPDEPP is part of the University of the Philippines, the country's national university and will have presence inside the NCC. It seeks to make itself a relevant partner to the community, the government, and other institutions that need its services in instruction, research and extension, and public service. An upcoming plan for an extension project being considered in UPDEPP is a partnership with the higher education institutions (HEIs) in Northern Luzon intended to encourage the sharing of Indigenous-traditional knowledge among the Indigenous Peoples of the North and Central Luzon areas. The Cordillera IPs are envisioned to share their ITK on rice terraces construction and maintenance with the Aytas. This ITK would be useful in the development and protection of the hilly parts of the ancestral domain areas of the Aytas in Central Luzon. The Cordillera and Ilocos IPs are likewise envisioned to share their ITK on weaving with the Aytas. The help of the Department of Agriculture (DA) in the development of fiber plant variety that would grow in Central Luzon would be sought. The Aytas, in turn, could share their botanical knowledge with the Cordilleran IPS. Sharing of other ITK practices with the IPs in Northern Luzon is also being considered. These practices include culture/mythic stories/ritual dances, songs, healing practices and traditions, among others.

The review of the curriculum and exemplar lesson plans to be used in an alternative learning system mode in the Ayta Ethno-Botanical School has been undertaken as earlier mentioned. The curriculum and the needed competencies and outcomes are expected to be ready upon the completion of the infrastructure and land

development of the school to be built inside New Clark City. Should the AEBS Museum of Ayta Botanical Knowledge succeed, it would be replicated in the ancestral domains of the Aytas around the Clark Main and Sub-Zones.

Expected Outcomes and Outputs of the AEBS

The expected outcomes of the learning process in the AEBS are as follows:
   1) A model of a culturally-appropriate learning environment for the Aytas; and
   2) A model of sustainable livelihood creation for the Aytas using the resources of their environment and their Indigenous/traditional knowledge

The expected outputs of the AEBS, set for the next ten years upon the commencement of the school, are as follows:
   1) Knowledge-reclamation of the Aytas of themselves, their heritage, their community, and the world around them;
   2) Enriched and sustained cultural traditions and reintegration of the Aytas with their people in their habitat;
   3) Rehabilitated, developed, and protected forests in the New Clark City and subsequently the forests in the ancestral domains of the Aytas;
   4) Sufficient supply of food and other basic needs of the Aytas in their lands;
   5) Rich supply of water for lowland farm irrigation and other water uses coming from the watersheds of upland forests not only in NCC but also neighboring areas of the provinces of Tarlac and Pampanga such as Zambales, Bataan and Nueva Ecija.
   6) Environmental sustainability in the new metropolis.

CONCLUSION

There is a sincere effort on the part of the state area developer BCDA to make the NCC an inclusive metropolis. It started with an assessment on who were using the former military area and later compensating them for vacating the development site despite having already benefited from the use of the government property. A laudable gesture of the BCDA is to design the new city as the area that will save the National Capital Region from congestion and threats of disasters while adopting a philosophy of space that marries culture and regional development, particularly the way of life of Indigenous Peoples that protects and respects the environment. The project to establish an ethno-botanical garden inside the new city where the Aytas could have culturally-appropriate education while working is a response to their clamor for opportunities for education services while being able to sustain themselves at the same time. Around the Ayta area are supporters and defenders and cultural workers in the community who are committed to helping them live their way of life and appreciate the value of maintaining their cultural identity and heritage in the place of their natural habitat. The challenge for the future is to get the rest of the new metropolitan population to imbibe such a philosophy and learn from the lessons of living in the National Capital Region, an area that has long overreached its carrying capacity.

REFERENCES

Asian Development Bank & Potsdam Institute for Climate Impact Research. (2017). *A Region at Risk: The Human Dimensions of Climate Change in Asia and the Pacific*. ADB.

Champagne, D. (2008). *Indigenous Peoples' Movement: Theory, Policy, and Practice*. University of Saskatchewan.

Chirino, P. (1604). *Relation of the Filipinas Islands*. Blair, Emma H. and James Alexander Robertson, eds. The Philippine Islands, 1493-1803. Vols VII. Cleveland: The Arthur H. Clark Company. 1903-1909, 55 vols.

David, M. E. (2011). *Aeta Mag-anchi's Cultural History, Concept of Time and Territoriality: Its Implications to Education*. 2011 International Conference on Social Science and Humanity IPEDR vol.5. IACSIT Press.

Fox, R. (1953). *Pinatubo Negritoes: Their Useful Plants and Material Culture*. Manila: Bureau of Printing.

Gobrin, G. & Andin, A. (2002). *Development Conflict: The Philippine Experience.* Minority Rights Group International: London, UK. www.minorityrights.org.

Headlandt, T. (1985). "Imposed Values and Aid Rejection Among Casiguran Agta." in P. Bion and Agnes Estioko-Griffin (eds). *The Ayta of Northern Luzon: Recent Studies*, 102-118. Humanities Series, 16. University of San Carlos.

ICCA Registry. (2013). Explore Case Studies: Maalagay Dogal/Matilo. https://www.iccaregistry.org/en/explore/Philippines/maalagay-dogalmatilo. Retrieved November 20, 2020.

Manabat, A. (2019). Capas mayor, Aeta leaders deny dislocation at NCC. Business Mirror. https://businessmirror.com.ph/2019/07/12/capas-mayor-aeta-leaders-deny-dislocation-at-ncc/?

National Commission on Indigenous People Region 3. (2018). NCIP Region 3 By the Numbers 2018 3rd Quarter Accomplishment Report. https://www.ncipr3.com/ncip-region-3-by-the-numbers-2018-accomplishments-as-of-3rd-quarter/

National Commission on Indigenous People Region 3. (2019). NCIP Statement on the Seven-day   Notice to Evacuate by BCDA. https://www.ncipr3.com/ncip-statement-on-the-seven-day-notice-to-evacuate-by-bcda/

Orejas, T. (2009a). "For Aetas, Struggle for Land Half-Won". Philippine Daily Inquirer - http://newsinfo.inquirer.net/inquirerheadlines/regions/view/20090529- 207873/For_Aetas%2C_struggle_for_land_half-won

Orejas, T. (2009b). "It's official: Pinatubo is now owned by Aetas" Archived November 18, 2011, at the Wayback Machine. PIPLinks https://www.pressreader.com/philippines/philippine-daily-inquirer-1109/20091127/284996850721692

Plasencia, J. (1589). *Customs of the Tagalogs*. Blair, Emma H. and James Alexander Robertson, eds. The Philippine Islands, 1493-1803. Vols VII. Cleveland: The Arthur H. Clark Company. 1903-1909, 55 vols.

Sebastian, F. C. (2008). *Getting Beyond the Commons Dilemma in Community-Based Forest Management in Central Luzon, Philippines: An Autoethnography*. PhD Dissertation. University of the Philippines.

Sebastian, F. C. (2014). *Rapid Assessment Report on the Clark Green City Stakeholders, Their Views on the Project, Claims and Expectations*. Bases Conversion Development Authority.

Sebastian, F. C. (2018). *Policy Study Towards the Institutionalization of the Climate Information System in Philippine Agri-fishery High-Risk Communities: Documentation and Assessment of Current Efforts*. Department of Agriculture-Bureau of Agricultural Research-UPLB Foundation Joint Research Project.

Sheppard, E. (2018). "Globalizing Capitalism's Raggedy Fringes: Thinking Through Jakarta". Area Development and Policy. Volume 4 Numbers 1-4. January-December 2019. London, UK: Routledge Taylor & Francis Group.

Subingsubing, K. & Ramos, M. (2019). "Development for Whom?" The Philippine Daily Inquirer. https://newsinfo.inquirer.net/1139364/new-clark-city-development-for-whom:// newsinfo.inquirer.net/1139364/new-clark-city-development-for-whom

Throsby, D. (2001). *Economics and Culture*. Cambridge University Press.

Van der Borg, J. and Russo, A.P. (2005). *The Impacts of Culture on the Economic Development of Cities*. European Institute for Comparative Urban Research Erasmus University Rotterdam. https://www.wien.gv.at/meu/fdb/pdf/intern-vergleichsstudie-ci-959-ma27.pdf

Wright, S. (2020). "The World's Most Densely Populated Cities." https://www.worldatlas.com/articles/the-world-s-most-densely-populated-cities.html

Mathematics in Art: Color Symmetries of Pampanga's Giant Christmas Lanterns

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Dedicated to Professor René P. Felix

ABSTRACT

One of the marks of Kapampangan art and culture is the Giant Christmas Lantern. Every Christmas season, giant lanterns designed by Pampanga's artists are displayed during the Giant Lantern Festival, known locally as "Ligligan Parul". In the Kapampangan vernacular, "parul" and "ligligan" mean lantern and competition respectively. In essence, the term "Ligligan Parul," embodies the contest among different barangays of creating the best giant lantern in the province. The colorful and symmetric designs of these giant lanterns have an entrancing effect and have become more and more intricate through the years.

This contribution explores the giant lantern as *math art*. The underlying uncolored designs of giant lanterns are simple symmetrical patterns whose mathematical structures are well known. There are various mathematical methods for coming up with the symmetric colorings of such patterns. We investigate the color symmetry of existing giant parol designs by matching them with color symmetry algorithms that make use of the subgroup structure of the symmetry group of a pattern. Finally, we demonstrate how to obtain symmetric colorings of the giant lantern that do not match any of the existing designs.

Keywords: Pampanga giant lantern, parol, symmetry, color symmetry, coset coloring

(1) INTRODUCTION AND OUTLINE

"There is geometry in the humming of the strings. There is music in the spacing of the spheres," Pythagoras once said. For this ancient philosopher and mathematician, the elegance of

mathematics was evident in the beauty and harmony in art. However, this link between math and art remains obscure to many, even though math has always appeared in various art forms. For instance, math appears in classical art's emphasis on symmetry and proportion, in the way the Asian art of origami adheres to the rules of geometry, and in the use of algorithms to generate 21st century digital art.

The relationship between math and art is reciprocal: art serves math, and math serves art. Scientists use art to explore and express their ideas. Art can demonstrate the elegance of mathematical theory and provides mathematicians a way to make the subject more accessible. Students are more receptive when they are able to visualize abstract concepts, especially if this is achieved through beautiful artworks.

Conversely, math is a servant of the arts. A formal analysis of art through math reveals shifts in schools of thought (Makovicky, 1986). Practice-based artists also use math to develop their techniques (Happerset, 2020). One of the most renowned of such artists is M.C. Escher, a 20th-century Dutch artist whose fascination with the Moorish patterns in the Alhambra led him to dive deep into complex math concepts. This allowed him to eventually create some of the most mind-bending images of 20th century art (Taschen, 2016). Susan Happersett, an artist whose love for math and art has led to her mission of changing the minds of those adverse to math through her art, creates rule-based art using mathematical algorithms (Happersett, 2020). In fact, we are seeing a new generation of artists who grew up with technology and are utilizing algorithmic processing to create digital art. As we also move towards a society where interdisciplinary studies are emphasized, math in art enables educators from different art fields to inject STEAM into their lessons (Happersett, 2020).

Collaboration between artists and mathematicians over the years reflects the reciprocal relationship between math and art. Many universities organize conferences where mathematicians and artists come together to explore the math and art connection. The most popular among these is the Bridges Conference, where mathematicians and artists from around the world meet every year to exchange ideas on the latest trends in math art. *The Journal of Mathematics and the Arts* is another result of the collaboration

between artists and mathematicians. This peer-reviewed journal was established in 2007 to provide mathematicians and artists a venue to publish work related to math art. It is designed to be "a place for those engaged in using mathematics in the creation of works of art, who seem to understand art arising from math or scientific endeavors, who strive to explore the mathematical implications of artistic works" (Journal of Mathematics and the Arts, n.d.).

Unfortunately, math art has hardly been explored in the Philippines. One possible reason is that many, especially those engaged in the arts, still view math as a dreaded subject to be avoided at all costs. Furthermore, only a handful of Filipino mathematicians are doing formal research in this area. Most of these mathematicians can trace their academic genealogy back to Professor René P. Felix, who pioneered the study of symmetry and color symmetry in the country. One of his students led a group that analyzed crystallographic patterns in Philippine Indigenous textiles (De Las Peñas et al., 2018). But apart from a few such studies, it is rare for artists and mathematicians to collaborate in the Philippines.

Through this contribution, we wish to promote the study of math art in the Philippines. In particular, our goals are: (1) to promote the study of math as it appears in Philippine art, (2) to introduce the formal study of color symmetry to the mathematicians of Central Luzon, (3) to encourage the use of art in instruction, especially in the teaching of abstract algebra to math majors, (4) to present to artists, especially those engaged in graphic and digital art, the possibility of using math to generate art, and (5) to motivate mathematicians and artists to collaborate in studying and producing math art.

To achieve these goals, we demonstrate color symmetry methods by applying them to Pampanga's giant lanterns. We hope that by choosing to apply color symmetry to a source of pride deeply rooted in the cultural heritage of Central Luzon, we are able to capture the interest of our target audience.

The designs of the giant lanterns are always symmetric. This is not surprising since symmetry, being pleasing to the eye, appears in many art forms (Conway et al., 2008). Even though the designs of the giant lanterns have become increasingly elaborate

over the years, the designs largely remain centered on the five-pointed star. Thus, the giant lanterns are simple symmetrical patterns whose mathematical structures are well-known. Furthermore, there are established mathematical methods for coloring such structures.

This article is organized as follows. Section 2 describes the methodology used to arrive at the results. We give a brief history of the art of parol making in Section 3. Section 4 discusses the design of the parol from the point of view of the artists and craftsmen. Meanwhile, Section 5 provides a theoretical discussion on the structure of the Pampanga giant lantern from the perspective of mathematical symmetry. In Section 6, we present a coloring method using the left and right cosets of a subgroup of the symmetry group of a pattern. We illustrate the algorithm by applying it to some designs of the Pampanga giant lantern. We end in Section 7 by summarizing the analysis and suggesting some areas for further research.

We have written this article in a way that makes it accessible to the various segments of our target audience. We use the language of mathematicians since we wish to demonstrate how art can be used in formal math instruction. However, we define concepts in a way that even those with only a basic knowledge of math may follow the discussion. We also give illustrations of the various math concepts and methods using a simple pointed star before applying them to the giant lantern. Given the goals of this contribution, we do not focus on justifying and proving the theory supporting these colorings. Those interested may consult the references for a deeper insight into the theory of color symmetry, specifically left coset colorings. A theoretical discussion of right coset colorings will be published elsewhere.

(2) METHODOLOGY

We analyzed the color symmetry of the giant lantern using standard techniques in the study of symmetry. We began by determining the mathematical structure of the uncolored giant lantern. We inspected recent designs of giant lanterns exhibited in various Giant Lantern Festivals. We also examined the designs in the Parul Sampernandu Coloring Book (City of San Fernando Pampanga Tourism Office, 2015), a collection of uncolored giant lantern

designs by some of Pampanga's most acclaimed parol artists. Once the mathematical structure of the uncolored pattern was established, we proceeded to analyze the colored designs. We matched the colored patterns with some color symmetry algorithm that would give rise to the colored pattern. Finally, we attempted to come up with symmetric colorings of the giant lantern not similar to existing designs. We did this by altering the parameters of the color symmetry algorithm that matched existing designs, or by applying a color symmetry algorithm that did not match the existing designs. To supplement our analysis, we also interviewed some of the giant parol artists to gain insight into how they come up with their designs.

(3) HISTORY OF THE ART OF PAROL MAKING

The lantern making tradition in San Fernando, Pampanga traces back its origins to Spanish colonists in Bacolor, the old capital of Pampanga, who urged people to hold lantern processions honoring the Virgin Mary, "Our Lady of La Naval" (dela Cruz, 2013). These religious processions are considered the forerunners of the "Lubenas," the street processions that are held for nine straight nights during the Misa de Gallo. In these events, white paper lanterns were shaped into various images like crosses, stars, fish, angels and sheep, and used to illuminate the images of patron saints (Orejas, 2012).

The art of parol making is credited to Francisco Estanislao, who in 1908 was said to have made the first parol utilizing a five-point star design. In Estanislao's time, electricity had not yet come to Bacolor (Tapnio, 2018). Townsfolk used parols to light their path going to the traditional dawn masses or Misa de Gallo. In making the parol, Estanislao employed bamboo sticks for the frame and papel de japon for the finishing. Carbide, locally known as kalburo, was used to illuminate the lantern (Cultural Center of the Philippines, 2017).

According to De la Cruz (2013), the first parol festival occurred in 1930. The term "Ligligan Parul" or lantern showdown was an exhibition of how electricity, which was new at that time, could power the light bulbs of the parols for the entire night. Sometime in the 1950's, parol makers started to leave behind the classic five-pointed star made with bamboo and papel de japon and

began employing various designs such as psychedelic kaleidoscopes, stained glass windows, prismatic pinwheels, oversized snowflakes, and batik textiles. Then in the 1960's, parol makers ventured into the commercialization of their lanterns and a cottage industry was born (De la Cruz, 2013).

Through the years technological advances have enabled parol makers to create more complex designs and lighting sequences. Pampanga lanterns have become a staple of exhibitions, and Kapampangan lantern makers are regularly commissioned to create special lanterns to commemorate events not only in the Philippines but in different parts of the world (Arvin B. Quiwa, personal communication, August 15, 2015).

(4) DESIGN OF THE PAROL

The traditional design of a parol is a star-shaped framework constructed with bamboo sticks. To complete the parol, crepe paper or other decorative material like cellophane is pasted over the structure after which two tails made of strips of crepe paper are attached to two points of the star. According to Rolando S. Quiambao, a noted lantern designer and maker in Pampanga, the traditional lantern has four main parts. The "tambor," a term derived from the Filipino word tambol or drum, is the center of the lantern. Around the tambor is the "siku- siku" or the main star. Siku is the Kapampangan word for elbow. The "palimbon" or procession surrounds the "siku-siku." Finally, there is the outer layer or the "puntetas" which is derived from the word punta or edge (personal communication, August 15, 2020). Figure 1 shows Quiambao with one of his designs.

Figure 1

Ronald S. Quiambao, noted lantern designer and maker in Pampanga, with one of his designs.

In the early days of giant lantern making, artisans welded steel frames to set up the framework of the parol design. Cardboard was used to line the frame, and then thousands of incandescent light bulbs were installed and wired. In those years, individual switches were used to control the lights, and these were turned on and off in time with the music. Colored paper was then used instead of papel de japon or crepe paper. Later on, rotors, large steel barrels powered by electricity, replaced the hand-controlled switches in producing the desired effect of dancing lights. This was made possible by putting masking tape on the rotor to establish the lighting sequence. The light bulbs were connected to the rotor through hairpins that were attached to the ends of the wires (City of San Fernando, Pampanga, n.d.). Rotors are made of aluminum sheets rolled into a barrel shape which varies in size from 3 inches to 5 meters long depending on the desired light patterns. Operators turn a steering wheel that is welded to the rotor to make half or full turns to achieve the flashing of lights in the course of a performance. After long years of using the rotors and incandescent bulbs, LED electronic lights became the norm, and to produce the dancing light effect, some

lantern makers have resorted to the use of sequencers. Designed by Alyosha Ezra Mallari and his team of engineers, sequencers automate the lighting system and eliminate the need for a rotor operator. The desired sequence of lights is written in a program and uploaded to the sequencer which is a machine the size of the CPU of a computer. However, lantern makers still prefer the use of rotors for artistic purposes and to uphold tradition (Orejas, 2017).

Evidently, the making of giant parols is a complex process. However, Quiambao revealed that lantern designers do not actually undergo formal training. Instead, they become apprentices and learn from practice. The current crop of lantern designers in Pampanga started their career in the giant lantern making industry and then ventured into the commercial production of lanterns (personal communication, August 15, 2015).

The beautiful giant lanterns of Pampanga are also the byproduct of the competitive and collaborative spirit of lantern makers from the barangays and towns participating in the lantern festival called "Ligligan Parul" or Giant Lantern Festival held every December of each year. One of the major competitors in this competition, Arvin B. Quiwa, detailed the intricate and modern process of producing a giant lantern. In the recent past, the first step for lantern makers was the design conceptualization where current trends were researched and used as references. Then, a plywood prototype was created for the layout of the frame which was either a 5- or 10-point star. Today, this process has been replaced with the use of photo editing and drafting software that generates a tarpaulin printout which serves as the pattern for creating the welded metal framework. Afterwards, the LED lighting is installed. Alvin Quiwa added that contemporary parols now use a white finishing instead of a colored one, and it is the sequence of LED lighting effects which produces the parol design. He further mentioned that in color selection, contrasting colors are utilized to make the geometric shapes in the pattern distinct from each other and that as many as 15,000 bulbs are sometimes used to realize a particular design (personal communication, August 15, 2020). Figure 2 shows photos of Arvin B. Quiwa and his brother, Eric B. Quiwa, also a giant lantern artist, with lanterns they designed.

Figure 2

Renowned Parol Artists from Pampanga

Note: (A) Arvin B. Quiwa and (B) Eric B. Quiwa (rightmost in photo) come from a family of renowned giant lantern artists. The giant lantern in the photo of Eric B. Quiwa will be displayed in Lapulapu City as part of its quincentennial commemoration.

(5) SYMMETRIES OF THE PAMPANGA PAROL

To investigate the symmetries of the Pampanga parol, we consider it as a two-dimensional pattern. We alter patterns by applying *transformations*. Figure 3 shows how a star pattern is transformed by applying certain transformations: a rotation, a reflection, a contraction (resizing), and a stretch. We call the transformed pattern the original pattern's *image under the transformation*.

Figure 3

A two-dimensional star pattern and its images under certain transformations
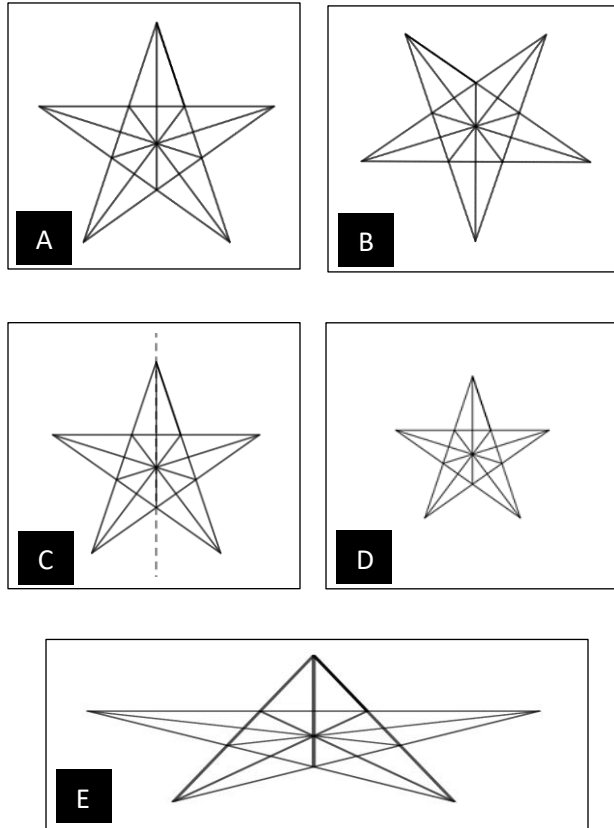
Note: The various transformations of a two-dimensional star pattern are shown above. (A) the original star pattern and its images after (B) a 36-degree rotation about the center of the pattern, (C) a reflection along a vertical line passing through the center of the pattern, (D) a contraction by 75%, and (E) a horizontal stretch.

In the study of symmetry, we are interested in a special type of transformation called *isometries.* Isometries preserve lengths, and consequently, do not alter the shape and size of an object. This means that the image of a pattern under an isometry is congruent to the original pattern. Rotations and reflections are isometries, while contractions and stretches are not, as seen in Figure 3. An isometry that does not alter a pattern is said to be a *symmetry of the pattern*. Since the image of a pattern under a symmetry is the same as the original pattern, we also say that a symmetry of a pattern *fixes* the pattern. Among the five transformations shown in Figure 3(b)-(e), we see that only the reflection in Figure 3(c) is a symmetry of the star pattern.

Mathematical symmetry classifies an uncolored parol pattern as a *discrete finite pattern* (Grünbaum & Shephard, 1987). Such patterns can only have rotation and reflection symmetries (Conway et al., 2008). We denote a rotation by $Rot(O, \theta)$, where O is the center of the rotation and θ is the measure of its angle of rotation. By convention, a positive θ is measured in the counterclockwise direction. We further assume for convenience that θ is in degrees and $\theta \in [0,360)$. (If $\theta \notin [0,360)$, we convert it to r, where $r = \theta - \lfloor \theta/360 \rfloor \cdot 360$ and $\lfloor \cdot \rfloor$ denotes the floor or greatest integer function.) Meanwhile, a reflection is identified with its axis of reflection ℓ, so we write a reflection as $Ref(l)$. Given a finite pattern centered at O, all its rotation symmetries are of the form $Rot(O, \theta)$, with θ rational, while all its reflection symmetries are of the form $Ref(l)$ where ℓ passes through O (Conway et al., 2008). Refer to the star pattern shown in Figure 4. It has five rotation symmetries: $Rot(O, 0)$, $Rot(O, 72)$, $Rot(O, 144)$, $Rot(O, 216)$ and $Rot(O, 288)$. It also has five reflection symmetries which are $Ref(l_1)$, $Ref(l_2)$, $Ref(l_3)$, $Ref(l_4)$ and $Ref(l_5)$, where l_1, l_2, l_3, l_4 and l_5 are lines passing through O and inclined at 18°, 54°, 90°, 126°, and 162°, respectively, from the right side of the horizontal line passing through O.

We define the *product* $t_1 t_2$ of two transformations t_1 and t_2 as the transformation obtained when we apply t_2 followed by t_1. Products of transformations are not commutative since $t_1 t_2$ is not always the same as $t_2 t_1$. Table 1 gives the products of rotations and reflections that are of interest to us.

Figure 4
Symmetries of a discrete, finite star pattern
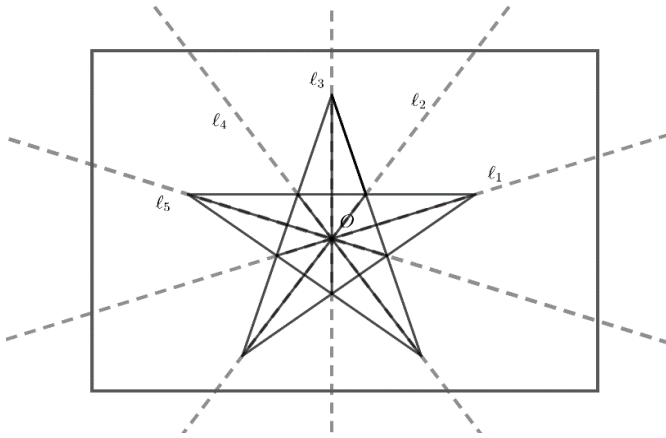
The *identity transformation*, denoted by e, is the transformation that fixes any pattern. We identify e with $Rot(O, 0)$ since a rotation by 0° does not alter any pattern. In this sense, we say $Rot(O, 0°)$ is the *trivial rotation*. Observe that if t is any transformation, $te = et = t$. The *order* of a transformation t is the smallest positive integer n such that $t^n = e$, if it exists. It is easy to see that e is of order 1, while a reflection is of order 2. On the other hand, if $\theta = p/q$, where p and q are both nonzero integers such that $gcd(p, q) = 1$, the order of $Rot(O, \theta)$ is $lcm(p, 360q)/p$. If t is a transformation, its *inverse* t^{-1} is the transformation that satisfies $tt^{-1} = t^{-1}t = e$. If t is a rotation of order n, then $t^{-1} = t^{n-1}$. Meanwhile, if t is a reflection, then $t^{-1} = t$. Furthermore, it is easy to show that if $t_1 = Rot(O, \theta)$ and $t_2 = Ref(l)$ such that O is on ℓ, then $t_2 t_1 = t_1^{-1} t_2$.

Table 1

Products of some rotations and reflections

t_1	t_2	t_1t_2
$Rot(O, \theta_1)$	$Rot(O, \theta_2)$	$Rot(O, \theta_1 + \theta_2)$, this product is commutative
$Rot(O, \theta)$	$Ref(l)$, ℓ passes through O	$Ref(m)$, where m passes through O and the angle between ℓ and m, measured from ℓ to m is $\theta/2$
$Ref(l)$	$Ref(m)$, where l and m intersect at O	$Rot(O, 2\theta)$, where θ is the angle between l and m, measured in the direction from m to ℓ.

In general, given the set of symmetries of a pattern, the product of two symmetries is also a symmetry, the identity transformation is a symmetry, and the inverse of a symmetry is also a symmetry. Thus, the set of symmetries of a pattern has the structure of a mathematical group, and we call this set the *symmetry group* of the pattern. If G is the symmetry group of a finite discrete pattern, then G is either a finite cyclic group C_n or a finite dihedral group D_n (Grünbaum & Shephard, 1987). In the first case, $G = \{e, a, a^2, \dots, a^{n-1}\}$, while in the latter case, $G = \{e, a, a^2, \dots, a^{n-1}, b, ab, a^2b, \dots, a^{n-1}b\}$, where a is a rotation of order n with the smallest angle of rotation, and b is any reflection in G. Since every element of G can be written as a product of a power of a and/or b, we say that a and/or b *generate/s* G. We write this as $G = \langle a \rangle$ when $G \cong C_n$ and as $G = \langle a, b \rangle$ when $G \cong D_n$.

Consider the symmetries of the star pattern centered at O as shown in Figure 4. Then, $G = \langle a, b \rangle$, where $a = Rot(O, 72)$ and $b = Ref(l_3)$. (We can use any of the reflections to generate G, but we use the vertical line passing through O for convenience). Since a is of order $n = 5$, we have $G \cong D_5$.

Since the uncolored Pampanga parol is normally centered on a five-pointed star, its symmetry group is usually C_n or D_n, where n is some multiple of 5 (City of San Fernando Pampanga Tourism Office, 2015; "Amazing Giant Parol Festival in Pampanga", n.d.). Though this seems to be the rule, there are exceptions such as the

uncolored parol in Figure 2(B), whose symmetry group is C_8. Hence, we see that a few of the newer generation parol artists are beginning to move away from the tradition of basing their designs on the five-pointed star.

The Pampanga parol is composed of different shapes with specific positions in two-dimensional space. We think of these shapes, together with their position in space, as the *tiles* that make up the pattern. In Figure 5(a), the non-overlapping triangles are the tiles of the pattern. Now suppose X is the set of tiles of some uncolored finite discrete pattern with symmetry group G. If $g \in G$ and x is a tile in X, we denote by gx the image of x under the symmetry g. Since g is in the symmetry group of X, gx is also a tile in X. In fact, $G(X) = \{gx \mid g \in G, x \in X\} = X$. Hence, G *acts* on X. The stabilizer of x in G, denoted $Stab_G x$, is the set of all elements in G that fix x, or $Stab_G(x) = \{gx = x\}$. The *orbit* of a tile x under the action of G, written Gx, is the set of all images of x under all symmetries in G, or $Gx = \{gx \mid g \in G\}$. If x_1 and x_2 are tiles in X, then Gx_1 and Gx_2 are either equal or disjoint. Furthermore, the union of all the orbits is X. Hence, the collection of unique orbits is a partition of X. We observe this in Figure 5(a). Let X be the set of tiles in the star pattern and let x_1 and x_2 be as shown in the figure. We see that X has two orbits $X_1 = Gx_1$ and $X_2 = Gx_2$ under the action of G and $X_1 \cup X_2 = X$.

We say that two sets have a *one-to-one correspondence* if we can define a function between the two sets such that each element of one set is associated with one and only one element of the other set. It is easy to see that two finite sets have a one-to-one correspondence if and only if they have the same number of elements. Hence, if the symmetry group G is finite, then G and the orbit Gx of x under the action of G have a one-to-one correspondence if G and Gx have the same number of elements. The two-star patterns in Figure 5 have the same symmetry group G. Each orbit of the star pattern in Figure 5(a) has a one-to-one correspondence with G. However, this is not the case for the star pattern in Figure 5(b) since G has 10 elements while Gx_2 has only 5 elements.

Figure 5
Two-star Patterns with the Same Symmetry Group
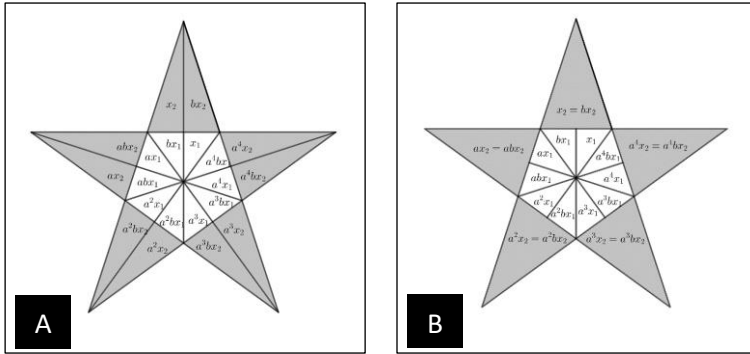
Note: (A) A star pattern with two orbits under its symmetry group. The white tiles belong to the first orbit, while the grey tiles belong to the second orbit. Each orbit has a one-to-one correspondence with the pattern's symmetry group (B) A star pattern with two orbits under its symmetry group. The first orbit consists of the ten white tiles and has a one-to-one correspondence with the pattern's symmetry group. The second orbit consists of the five gray tiles; it does not have a one-to-one correspondence with the pattern's symmetry group.

(6) COLOR SYMMETRIES OF THE PAMPANGA PAROL

Consider the problem of coloring the Pampanga parol so that the colored pattern also exhibits some form of symmetry. We call the colored version of an uncolored pattern X a *coloring of X*. *Coset coloring* is a mathematical method used to obtain symmetric colorings of a pattern (Felix, 2011).

To understand coset coloring, we need some additional concepts from abstract algebra. Let G be the symmetry group of X. A *subgroup H* of G is a subset of G that also has a group structure. Recall that the symmetry group of a discrete finite pattern is $G = \langle a \rangle \cong C_n$ or $G = \langle a, b \rangle \cong D_n$, where a is a rotation of order n and b is a reflection. If $G = \langle a \rangle \cong C_n$, the subgroups of G are of the form $H = \langle a^r \rangle \cong C_{n/r}$, where r is a divisor of n. If $G = \langle a, b \rangle \cong D_n$, the

subgroups of G are either $H = \langle a^r \rangle \cong C_{n/r}$ or $H = \langle a^r, a^s b \rangle \cong D_{n/r}$, where r is a divisor of n and $s \in \{0,1,2,\dots,r-1\}$.

A *left coset* of a subgroup H of G is a set $gH = \{ h \in H \}$, where g is some element of G. Meanwhile, a *right coset* of H is $Hg = \{ h \in H \}$, where g is some element of G. It is possible for $g_1 H = g_2 H$ or $Hg_1 = Hg_2$ even if $g_1 \neq g_2$. Given a subgroup H of G, the number of unique left cosets of H is equal to the number of unique right cosets. This number is known as the *index* of H in G, and we denote this by $[G:H]$. When G is finite, $[G:H] = |G|/|H|$, where $|\cdot|$ indicates the number of elements in the group. Generally, the left cosets of H are different from its right cosets. In case they coincide, we say that H is a *normal subgroup* of G. If $G = \langle a \rangle \cong C_n$, then all subgroups of H are normal. If $G = \langle a, b \rangle \cong D_n$, then $H = \langle a^r \rangle \cong C_{n/r}$ is always normal in G. However, $H = \langle a^r, a^s b \rangle \cong D_{n/r}$ is normal in G if and only if H is one of the following subgroups: $H = G$, $H = \{e\}$ or $H = \langle a^2, a^s b \rangle$. Clearly, the last case can happen only if n is even.

The set of left or right cosets of H is a partition of G. Under certain conditions, this partition of G gives rise to a partition of X. In general, we obtain coset colorings by associating a color to each set in the partition of X. However, the properties of colorings using left cosets are different from those of colorings using right cosets. For example, colorings using left cosets are said to be *perfect* in the sense that all elements of G induce a permutation of colors. That is, if $g \in G$ and C is the set of all tiles of a particular color, then all the tiles in gC have the same color. In fact, a coloring is perfect if and only if the coloring is a left coset coloring (Evidente, 2012; Loquias & Frettlöh, 2017; Junio & Walo, 2019). Colorings using right cosets have less symmetry, which sometimes lead to less typical and more interesting designs. The framework for coloring using left cosets when X has only one orbit under the action of G is discussed by Felix (2011). His students and their collaborators have extended this coloring framework to accommodate multiple orbits (Loquias & Frettlöh, 2017; Junio & Walo, 2019). We apply the extended framework since the set of tiles of a Pampanga parol pattern has multiple orbits under the action of its symmetry group. We also attribute to Felix the fundamentals for the right coset coloring method presented in this paper, which he discussed in numerous lectures. We are not aware of any published work using right cosets to obtain symmetric colorings.

(6.1) Left Coset Colorings

Fix $x \in X$. If gH is a left coset of H, then $gHx = \{h \in H\}$ is the set of images of x under the elements of gH. The next theorem gives the basis for left coset colorings. We do not discuss the proof here, but the interested reader may refer to (Evidente, 2012) and (Loquias & Frettlöh, 2017).

Theorem 1. Suppose X is the set of tiles in an uncolored finite discrete pattern with symmetry group G such that X has m orbits $X_1, X_2, \dots, X_m$ under the action of G. Fix any $x_i \in X_i$.

    (i)   *Coloring Method 1*: Let H_i be a subgroup of G such that H_i contains $Stab_G x_i$. Then $\cup_{i=1}^{m} \{g \in G\}$ is a partition of X, and we can color X symmetrically by assigning a color to each set in the partition.

    (ii)   *Coloring Method 2*: Let H be a subgroup of G such that H contains $Stab_G x_i$ for all $i \in \{1,2,\dots,m\}$. Then $\{g \in G\}$ is a partition of X, and we can color X symmetrically by assigning a unique color to each set in the partition.

We apply Theorem 1 to obtain a left coset coloring of a pattern by following this procedure:

1. Determine the symmetry group G of the pattern.
2. Let X be the set of tiles in the pattern. Find the orbits $X_1, X_2, \dots, X_m$ of X under the action of G. Choose an element x_i from each orbit X_i, $i \in \{1,2,\dots,m\}$
3. For Coloring Method 1: For each $i \in \{1,2,\dots,m\}$
    a. Select a subgroup H_i such that H_i contains the stabilizer of x_i.
    b. Determine the left cosets of H_i.
    c. For each left coset gH_i of H_i, get the set of images $gH_i x_i$ and assign the same color to the tiles in this set.
4. For Coloring Method 2:
    a. Select a subgroup H that contains the stabilizer of x_i for all $i \in \{1,2,\dots,m\}$.
    b. Determine the left cosets of H.
    c. For each left coset gH
        i. For each $i \in \{1,2,\dots,m\}$, get the set of images gHx_i.
        ii. Assign the same color to the tiles in the set $\cup_{i=1}^{m} gHx_i$.

Example. Let us color the star pattern in Figure 5(a) using left coset-method 2 following the steps outlined above. The symmetry group of the star is $G = \langle a, b \rangle \cong D_5$, where $a = Rot(O, 72)$, $b = Ref(l)$, O is the center of the star and l is the vertical line passing through O. Let X be the set of tiles in the star pattern and select x_1 and x_2 as shown in Figure 5(a). Now X has two orbits $X_1 = Gx_1$ and $X_2 = Gx_2$ under the action of G. The subgroups of G are of the form $H = \langle a^r \rangle \cong C_{5/r}$ or $H = \langle a^r, a^s b \rangle \cong D_{5/r}$, where $r \in \{1,5\}$ and $s \in \{0,1,2,\dots, r-1\}$. Table 2 lists all subgroups H of G.

Table 2

Subgroups of the symmetry group $G = \langle a, b \rangle \cong D_5$

H	Elements	$|H|$	Index	Normal
$H = \langle e \rangle$	e	1	10	Yes
$H = \langle a \rangle$	e, a, a^2, a^3, a^4	5	2	Yes
$H = \langle a^s b \rangle$, $s \in \{0,1,2,3,4\}$	$e, a^s b$	2	5	No
$H = \langle a, b \rangle$	$e, a, a^2, a^3, a^4, b, ab, a^2 b, a^3 b, a^{\cdot}$	10	1	Yes

Note: Subgroups of the symmetry group $G = \langle a, b \rangle \cong D_5$ of the star pattern, where $a = Rot(O, 72), b = Ref(l)$, O is the center of the star and l is the vertical line passing through O.

Note that $Stab_G x_1 = Stab_G x_2 = \{e\}$. Hence, we can select any subgroup H listed in Table 2. Let us choose $H = \langle a \rangle$. The left cosets of H are $H = \{e, a, a^2, a^3, a^4\}$ and $bH = \{b, ab, a^2 b, a^3 b, a^4 b\}$. We compute the images of x_1 and x_2 under the elements of H and obtain $Hx_1 = \{x_1, ax_1, a^2 x_1, a^3 x_1, a^4 x_1\}$ and $Hx_2 = \{x_2, ax_2, a^2 x_2, a^3 x_2, a^4 x_2\}$. Meanwhile, the images of x_1 and x_2 under the elements of bH are $bHx_1 = \{bx_1, abx_1, a^2 bx_1, a^3 bx_1, a^4 bx_1\}$ and $bHx_2 = \{bx_2, abx_2, a^3 bx_2, a^4 bx_2\}$, respectively. We assign the color white to $Hx_1 \cup Hx_2$ and the color blue to $bHx_1 \cup bHx_2$ and obtain the coloring of the star pattern shown in Figure 6(a). Since this is a left coset coloring, observe that the generators of G permute the colors of the coloring: a sends white to white and blue to blue, while b sends white to blue and blue to white. Since the generators of G permute the colors, it follows that all elements of G also permute the colors.

(6.2) Right Coset Colorings

Fix $x \in X$. If Hg is a right coset of H, then $Hgx = \{h \in H\}$ is the set of images of x under the elements of Hg. We obtain right coset colorings by applying the next theorem. Again, we do not prove the theorem here, but it is easy to show using basic definitions and theorems from abstract algebra.

Theorem 2. Suppose X is an uncolored pattern with symmetry group G such that X has m orbits $X_1, X_2, \dots, X_m$ under the action of G and each orbit has a one-to-one correspondence with the elements of G. Fix $x_i \in X_i$.

    (i)   *Coloring Method 1*: Let H_i be a subgroup of G. Then $\cup_{i=1}^{m} \{g \in G\}$ is a partition of X, and we can color X symmetrically by assigning a unique color to each set in the partition.

    (ii) *Coloring Method 2*: Let H be a subgroup of G. Then $\{g \in G\}$ is a partition of X, and we can color X symmetrically by assigning a unique color to each set in the partition.

We make some observations about right coset colorings. If all subgroups of G are normal, then the right cosets of any subgroup coincide with its left cosets. Hence, opting for right coset coloring only makes sense when G has at least one subgroup that is not normal. Furthermore, right coset coloring assumes that all orbits of X have a one-to-one correspondence with G. To work around this limitation, we only use method 1 when not all orbits have a one-to-one correspondence with G. For orbits that do not have a one-to-one correspondence with G, we use a normal subgroup of G containing the stabilizer of an element in that orbit to color that orbit. (In effect, we are using left coset coloring for that orbit.)

Thus, we can obtain a right coset coloring of a pattern by applying Theorem 2 using the following procedure:

1. Determine the symmetry group G of the pattern.
2. Let X be the set of tiles in the pattern. Find the orbits $X_1, X_2, \dots, X_m$ of X under the action of G. Choose an element x_i from each orbit X_i, $i \in \{1,2, \dots, m\}$.
3. For Coloring Method 1: For each $i \in \{1,2, \dots, m\}$.
   a. Select a subgroup H_i. If X_i does not have a one-to-one correspondence with G, choose a normal subgroup containing the stabilizer of x_i.

  b. Determine the right cosets of H_i.

  c. For each right coset $H_i g$ of H_i, get the set of images $H_i g x_i$ and assign the same color to the tiles in this set.

4. For Coloring Method 2:

  a. Select a subgroup H.

  b. Determine the right cosets of H.

  c. For each right coset Hg

    i. For each $i \in \{1, 2, \ldots, m\}$, get the set of images Hgx_i.

    ii. Assign the same color to the tiles in the set $\cup_{i=1}^{m} Hgx_i$.

Example. We color the star pattern in Figure 5(b) using the procedure above. The symmetry group of the star pattern is $G = \langle a, b \rangle \cong D_5$, where $a = Rot(O, 72)$, $b = Ref(l)$, O is the center of the star, and l is the vertical line passing through O. If X is the set of tiles in the star pattern, then the orbits of X under the action of G are given by $X_1 = Gx_1$ and $X_2 = Gx_2$. Notice that X_1 has a one-to-one correspondence with G, but X_2 does not. Thus, we can only use method 1. We can use any subgroup to color X_1. Choose $H_1 = \langle b \rangle$, with right cosets $H_1, H_1 a, H_1 a^2, H_1 a^3, H_1 a^4$. We need to use a normal subgroup of G that contains the stabilizer of x_2 to color X_2. Since $Stab_G x_2 = \{e, b\}$, our only option is to use $H_2 = \langle a, b \rangle$. Since $H_2 = G$, the only coset of H_2 is itself.

   The sets of images of x_1 under the elements of the cosets of H_1 are

$$H_1 x_1 = \{x_1, bx_1\} \qquad H_1 a x_1 = \{ax_1, a^4 bx_1\} \qquad H_1 a^2 x_1 = \{a^2 x_1, a^3 bx_1\}$$

$$H_1 a^3 x_1 = \{a^3 x_1, a^2 bx_1\} \qquad H_1 a^4 x_1 = \{a^4 x_1, abx_1\}$$

Meanwhile the set of images of x_2 under the elements of H_2 is
$$H_2 x_2 = \{x_2, ax_2, a^2 x_2, a^3 x_2, a^4 x_2, bx_2, abx_2, a^2 bx_2, a^3 bx_2, a^4 bx_2\}$$

But some of the elements in $H_2 x_2$ are equal, and we get
$$H_2 x_2 = \{x_2, ax_2, a^2 x_2, a^3 x_2, a^4 x_2\}$$

If we assign the colors yellow, orange, red, beige, white, and blue to $H_1 x_1, H_1 a x_1, H_1 a^2 x_1, H_1 a^3 x_1, H_1 a^4 x_1$, and $H_2 x_2$, respectively, we obtain the coloring shown in Figure 6(b).

Figure 6

A left coset-method 2 coloring of the star pattern (A), and a right coset-method 1 coloring of the modified star pattern (B)
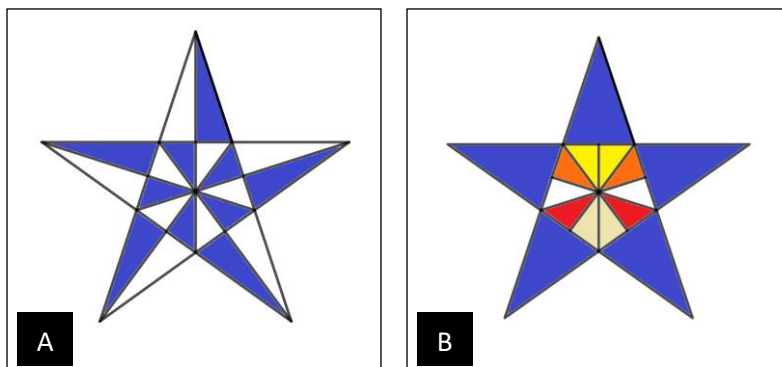
(6.3) Coset Colorings of the Pampanga Giant Lantern

If we examine the recent designs of giant lanterns by Pampanga's artists, we see that the colorings are usually based on left coset colorings, where the full symmetry group or an index 2 subgroup of the symmetry group is used. This is the case for the colorings in Figure 1 and Figure 2(b). This feature is also present in the majority of the giant lanterns displayed during the Giant Lantern Festival ("Amazing Giant Parol Festival in Pampanga", n.d.). Observe that the elements of the symmetry group permute the colors in each orbit, indicating that the coloring can be obtained using left cosets. Furthermore, there are at most two colors in each orbit, so either an index 1 or index 2 subgroup of the symmetry group was used.

We now derive some symmetrical colorings of the parol that are dissimilar to existing designs by using left coset colorings with subgroups of higher index or by using right coset colorings. We applied the coset coloring method to the giant lantern patterns in the Parul Sampernandu Coloring Book (City of San Fernando Pampanga Tourism Office, 2015). Although not all these designs have been displayed in the Giant Lantern Festival, these were designed by some of Pampanga's renowned artists. The symmetry groups of most giant lantern patterns in the coloring book are of type D_{10}, while some are of type C_{10} or D_5. The patterns are very intricate

such that the set of tiles usually have more than 20 orbits under the symmetry group. Since there are too many orbits, we opted to use the same color in distinct orbits at times. Figure 7 shows two patterns taken from the coloring book. The symmetry group of the pattern shown in Figure 7(a) is $G = \langle a \rangle \cong C_{10}$. The coloring is obtained by left coset coloring-method 2 using the subgroups $\langle a \rangle$, $\langle a^2 \rangle$ and $\langle a^5 \rangle$. Figure 7(b) shows a coloring of a parol pattern with symmetry group $G = \langle a, b \rangle \cong D_{10}$. The pattern is colored using right coset-method 2 since not all orbits have a one-to-one correspondence with the symmetry group. The subgroups $\langle a, b \rangle$, $\langle a^2, ab \rangle$ and $\langle a^5, b \rangle$ are used for the coloring.

Figure 7

Examples of a left coset coloring (A) and a right coset coloring (B) of the Pampanga Parol
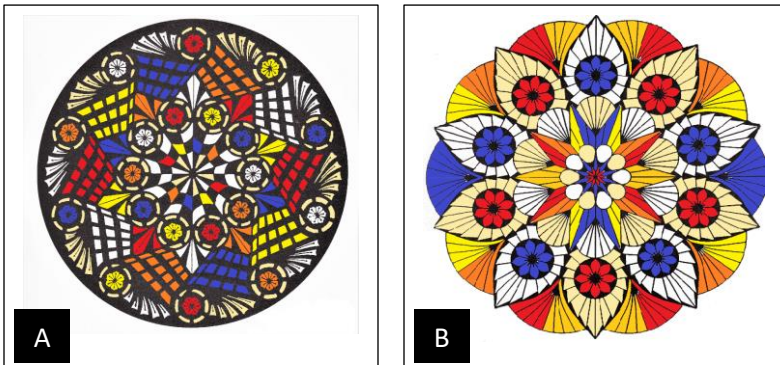
(7) CONCLUSION AND RECOMMENDATIONS

This paper examines the symmetries and color symmetries of Pampanga's giant lanterns. The symmetry group of the uncolored designs are either finite cyclic or a finite dihedral where the group of rotations is generated by a rotation or order n about the center, and where n is usually a multiple of 5. The existence of designs where n is not a multiple of 5 reveals that some artists are already departing from the tradition of centering their designs on the five-pointed star. Color symmetry analysis reveals that colored designs by parol artists match left coset colorings where the subgroups of the symmetry group used for the coloring is either index 1 or 2. We show how to obtain a different variety of colorings by using higher index subgroups with left coset coloring or by using right coset coloring.

Left or right coset colorings are just one of many methods that allow us to come up with symmetric colorings. Other methods include employing an algorithm that uses double cosets or exploring colorings that may be obtained from different coloring methods that specify the level of symmetry attained: perfect, semiperfect, chirally perfect. One may also attempt to find a more general approach to address the limitation encountered in right coset colorings when there is no one-to-one correspondence between the symmetry group and the orbits of the tiles under the symmetry group. In fact, those interested in the theory of color symmetry may analyze the structural properties of right coset colorings and double coset colorings.

We hope that this contribution encourages mathematicians to do research on math art, artists to explore the ways math can be used to generate art, and teachers to use math art for instruction. We also hope this initiates more collaboration between mathematicians and artists, especially those of Central Luzon. This paper is just a glimpse into the world of math art. Indeed, there are still many areas to be explored in this fascinating field.

ACKNOWLEDGEMENTS

REFERENCES

Amazing Giant Parol (Lantern) Festival in Pampanga. (n.d.). Retrieved from http://www.traveltothephilippines.info/2012/05/14/amazing-giant-parol-lantern-festival-in-pampanga/

City of San Fernando Pampanga Tourism Office. (2015). *Parul Sampernandu Coloring Book: Featuring the works of famous San Fernando Lantern Makers* (Vol. 01). San Fernando, Pampanga: Arkicamp Heritage Fil-Asia, INC.

City of San Fernando, Pampanga. (n.d.). *Giant Lantern Festival*. Retrieved from City of San Fernando Official Website: https://cityofsanfernando.gov.ph/forvisitors/giantlantern festival

Conway, J., Burgiel, H., & Goodman-Strauss, C. (2008). *The symmetries of things.* Wellesley, Massachusetts: A.K. Peters, Ltd.

Cultural Center of the Philippines. (2017). PARUL SAMPERNANDU AT THE CCP. Retrieved September 10, 2020, from https://www.culturalcenter.gov.ph/press-releases/parul-sampernandu-at-the-ccp

de la Cruz, A. G. (2013, December 24). *CNN Travel*. Retrieved September 5, 2020, from "The giant lanterns of San Fernando, Asia's Christmas capital." https://edition.cnn.com/travel/article/san-fernando-philippines-christmas/index.html

De Las Peñas, M. L. A., Garciano, A., Verzosa, D. & Taganap, E. (2018). *Crystallographic patterns in Philippine indigenous textiles*. Journal of Applied Crystallography. 51. DOI: 10.1107/S1600576718002182.

Evidente, I. (2012). *Colorings of Tilings with a Singular Center*. PhD Dissertation, Institute of Mathematics, University of the Philippines Diliman.

Felix, R. (2011). Color Symmetry. *MathCryst Workshop on Mathematical Crystallography.* Quezon City.

Grünbaum, B., & Shephard, G. (1987). *Tilings and Patterns.* New York: Freeman.

Happersett, S. (2020). Guest editor's introduction, Journal of Mathematics and the Arts, 14:1-2, 1-3, DOI: 10.1080/17513472.2020.1762278

Journal of Mathematics and the Arts (n.d.) *Aims and Scope*. Retrieved from https://www.tandfonline.com/action/journalInformation?show=aimsScope&journalCode=tmaa20

Junio, A., & Walo, M. (2019). Perfect colorings of patterns with multiple orbits. *Acta Crystallographica Section A, 75*, 814-826.

Loquias, M., & Frettlöh, D. (2017). Perfect colorings of hyperbolic buckyball tilings. *Acta Crystallographica Section A*, (p. C289).

Makovicky, E. (1986). *Symmetrology of art: coloured and generalized symmetries*, Computers & Mathematics with Applications, Volume 12, Issues 3–4, Part 2, 1986, Pages 949-980, ISSN 0898-1221, DOI: 10.1016/0898-1221(86)90435-9.

Orejas, T. (2017, December 16). *Pampanga craftsmen stick to tradition in lighting giant lanterns*. Retrieved September 10, 2020, from Inquirer.net: https://newsinfo.inquirer.net/952833/pampanga-craftsmen-stick-to-tradition-in-lighting-giant-lanterns

Orejas, T. (2012). 'Lubenas' is alive in Angeles City. Retrieved September 20, 2020,   from Inquirer.net: https://newsinfo.inquirer.net/324159/lubenas-is-alive-in-angeles-city

Tapnio, K. (2018). *The Hands That Craft Stars From Seashells, A look at the history and artistry that goes into each Filipino parol.* Retrieved from Spot.ph: https://www.spot.ph/arts-culture/the-latest-arts-culture/76169/parol-history-background-a2748-20181225-lfrm

Taschen, B. (2016). *M.C. Escher. The Graphic Work (Basic Art Series 2.0)* (Illustrated ed.). Cologne, Germany: TASCHEN.

Evolution of Management Control Systems in Private Nonprofit Higher Educational Institutions

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Abstract

This study addresses the use and evolution of management control systems (MCS) in private nonprofit higher education institutions (HEIs) in Pampanga as they undergo stages of development, which involve academic and MCS milestones. The case study method was used in investigating the evolution of MCS in three private nonprofit HEIs. From the results, an MCS transformation model for such HEIs was developed. The research reveals the significant role of evolved MCS in (a) efficiently managing organizational growth; (b) attaining operational quality for better and relevant academic services; (c) fostering empowerment, motivation, and values development among school heads or managers; and (d) promoting the HEIs' capacity development to respond positively to opportunities in their external environment.

Keywords: management control, evolution, stages of development, higher educational institution, operational quality, milestones

Introduction

Private nonprofit, nonstock higher educational institutions (HEIs) share the government's responsibility in providing quality higher education that will contribute to nation-building. In a 2011 conference, higher education stakeholders' representatives from the industry, academe, and government enumerated three specific concerns related to the quality of private higher education (Philippine Business for Education [PBED], 2011). Among these concerns is the private HEI's quality of operations, which relates to the accomplishment of the other two quality concerns—quality of faculty and quality of program offerings (PBED, 2011). Operational

quality is defined as the "optimal/efficient and effective use of resources to achieve the institution's set outcomes (vision-mission-goals-objectives)", the "smooth flow and execution of processes and systems", and the HEI's "capacity to implement quality educational programs consistently and sustainably" (PBED, 2011, p. 17).

The requirements of operational quality point to the HEIs' need to use management control systems in their organizations. Anthony (as cited in Hofstede, 1981) defined management control as the "process by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of the organization's objectives" (p. 193). Likewise, Maciariello (1984) wrote that a management control system (MCS) aims to "assist management in the allocation of its resources so as to facilitate the attainment of the goals and the objectives of an organization" (p. 1). MCS involves planning, resource allocation, performance measurement and evaluation (Anthony & Govindarajan, 2007), as well as "monitoring performance and taking corrective action" to ensure the attainment of goals (Maciariello, 1984, p.2). All of the foregoing definitions or statements indicate the important role of MCS in the private HEIs' pursuit of quality of operations (PBED, 2011).

These institutions need to respond to the challenge of improving the quality and relevance of educational services. Moreover, they have to adapt themselves to their changing environments (Franco-Santos, et al., 2014) such as rapid changes in technology and the implementation of the K to 12 program in the country. Hence, there is a need for MCS, which consists of the "mechanisms and processes used by organizations for measuring, controlling and managing their performance, for implementing strategies and, ultimately, for achieving their overall objectives" (Ferreira & Otley, 2009, p. 5), arose.

However, the control mechanisms and processes in MCS are evolving to ensure that an organization such as an HEI accomplishes its goals and objectives and remains strategically competitive (Franco-Santos, et al., 2014). Therefore, the required controls and processes depend upon the development stage and size of the organization (Flamholtz, 1996). As the organization grows, it requires evolving its management controls toward a formalized structure to set its direction toward its primary goal (Merchant &

Van der Stede, 2012). For a private HEI, this goal is the provision of quality higher education.

There is, however, a dearth of studies on the evolution of management controls and processes in non-profit private HEIs. To fill this gap, this research focuses on the MCS transformation experiences of three homegrown, nonprofit, nonstock private HEIs in Pampanga. Specifically, it addresses the research question: "How did private non-profit HEIs in Pampanga transform their management controls and processes from informal to formal systems?"

The Province of Pampanga is said to possibly be the "future metropolis that will replace the old, congested, and dying Metro Manila", developed to be "an example of what a modern and international destination is in terms of business, urban communities and center for governance" (Beltran, 2017). This was accordingly stated due to ongoing and future projects and developments in the province, in particular the cities of San Fernando and Angeles, the town of Lubao, and the Clark Freeport Zone (Beltran, 2017). President Rodrigo Duterte specifically mentioned Clark to soon "become the next economic hub in Luzon" (Ballaran, 2017). Clark, with 1,260 business locators as of December 31, 2019 (CDC, 2019), also serves as employment generator. It reported 136,418 workers from these locators, which is an 11.47% increase from 2018 (CDC, 2019). These figures will definitely increase with the ongoing and future construction projects such as those for New Clark City, Clark International Airport, and the National Government Administration Center (Cardinoza, 2018). These projects are part of the "Build, Build, Build" (BBB) Program of the present administration (Mawis, 2018). Despite encountering some setbacks following the COVID-19 pandemic, the flagship projects under the BBB Program have resumed (Malindog-Uy, 2020).

Such developments present major opportunities for growth to both for-profit and non-profit organizations in the local communities, particularly private higher educational institutions. HEIs, known to be centers of knowledge and innovation, play an important role in providing quality education and training to produce and enhance manpower. There are also prospects for these HEIs to initiate collaborations or partnerships among other institutions, industries, and government agencies not only to

identify and fill manpower requirements but also to work on research development projects, thus contributing to both improving local job growth and economic progress (Porter, 2007). Among these educational institutions are homegrown, private nonprofit HEIs in Pampanga which have been operating for many decades. They are able to transform their respective organizations by using management control systems in managing their performance and are therefore equipped to meet the challenges posed by the ongoing growth (Franco-Santos, et al., 2014) in the province.

Purpose of the Paper

This study aimed to investigate the evolution of management control systems as private nonprofit HEIs underwent stages of development, to explore the use of the reward system as a component of the MCS, and to examine the benefits of evolved MCS on the HEIs' performance. From this study, a framework of MCS was developed in the context of the HEIs' organizational growth.

Anthony (1988) referred to formal management control systems as those with visible structures and explicitly authorized operations. These systems are designed for large organizations, where top management is not capable of making all decisions and is compelled to delegate some decision-making to lower-level managers. The larger the organization becomes and the more layers of management it has, the greater is its need for formal management control (Ramanathan & Hegstad, 1982). Such is the case for large schools like colleges and universities or HEIs. As they expand their operations, they need to adopt formal management control systems. The MCS comprises the HEI's clearly defined, documented, and purposely managed set of controls and processes, which evolved from informal to formal adoption.

The framework of this study involved (1) the use and evolution of management controls in the HEIs' stages of development, (2) the determinants of their emerging management controls, (3) the transformation of their organizational structures and management control processes, (4) their use of a reward system, and (5) the benefits of formalized MCS on their performance.

Use and Evolution of Management Controls

Many HEIs in the Philippines have been operating for decades and have experienced growth. Growth in these institutions is seen as a sign of success or progress. The indicators of growth may be in terms of the revenues generated from tuition fees and other school fees, physical and academic programs, student population, number of employees, or market share. Similar to other organizations, HEIs also undergo different stages of growth. Garcia (2016) however maintained that unlike business organizations, the school's commodity, which is education, is not prone to decline but can continue to grow and develop to contribute to national productivity.

Garcia's (2016) framework of study, which is based on his investigation of evolving schools in the National Capital Region, included the following four stages: initial stage (start of school operations), growth stage (characterized by expanding operations), maturation stage (marked by operational and resource stability, has professionalized and decentralized operations), and expansion stage (characterized by offering of graduate programs, physical expansion, pursuing or has acquired university status). The school, while undergoing its stages of growth, uses different types of management controls, where the extent of use depends upon the development stage of the school and its size. These controls include tools, techniques or functions used by the HEI administrator in influencing academic and non-academic managers to achieve the school's objectives.

Merchant (1998) proposed the use of four management controls—cultural, personnel, action, and results controls. Cultural controls serve to promote monitoring for people to adhere to norms and values. They are aimed to influence behavior before its actual performance. Personnel controls aim to clarify expectations and increase the likelihood of people to engage themselves in self-monitoring. These are also used to influence behavior before its actual performance. Action controls focus on monitoring the activities of people to ensure that they act properly, performing actions beneficial or not performing actions harmful to the organization. They are meant to influence behavior while the behavior is taking place. Results controls influence behavior to achieve organizational goals after behavior has taken place. They

are used to influence people's perception that desirable performance leads to rewards. According to Flamholtz (1996), these controls evolve from informal to formal use as organizations such as schools undergo their stages of development.

Determinants of Emerging Management Controls

Greiner (1998) stated that as organizations and their sub-units grow, they are at different evolution as well as revolution stages. Evolution is the growth stage, while revolution represents management practices unfit for the specific evolution period (Greiner, 1998). Management therefore is tasked with determining a new set of organizational practices that will become the basis for managing the next evolution stage (Greiner, 1998). Appropriate organizational responses then must be matched to a firm's stage of growth (Miller & Friesen, 1984). Thus, it is important that schools understand what cause the emergence of controls across the growth stages.

Age and Size of Organization. In his study of established, growing for-profit firms, Davila (2005) found that age and size determine emerging management control systems and that existing control systems affect the adoption of new ones. Through the learning experiences of the firm as it ages, an improved MCS emerges (Davila, 2005). As the organization grows in size, it "adopts systems that anchor informal interactions prevalent in its initial operations around a set of formalized systems" (Davila, 2005, p. 226). It is compelled to find new sets of organizational practices that become the basis for managing in the next period of growth (Greiner, 1998). Management practices and processes that work for a smaller-size entity are no longer appropriate as it grows (Merchant and Van der Stede, 2012; Simons, 2000, Flamholtz, 1996).

Strategic Thrusts. An organization's external environment presents strategic options which affect the emerging management controls (Anthony & Govindarajan, 2007). Generally, its strategic options include cost leadership and differentiation (Anthony & Govindarajan, 2007). Cost leadership can be achieved by emphasizing efficiency to minimize operational costs, while differentiation focuses on setting apart the organization's products or services from those of its competitors (Anthony & Govindarajan, 2007). For an HEI, it may be a differentiation of mission or programs,

enhancement of the school's physical appearance, or improvement in services (Shirley, 1988) such as quality of academic offerings. Whatever strategic options the organization will pursue, suitable controls should be chosen and implemented to support the strategic thrust (Anthony & Govindarajan, 2007).

Chief Executive Officer (CEO) Turnover. Davila (2005) and Greiner (1998) also emphasized that as the organization expands, the founder is usually replaced by a professional manager that necessitates the transformation of the informal organization into one that formalizes its processes. A manager who opts to retain its informal practices is limiting its growth (Greiner, 1998).

Transformation of Organizational Structures and Management Control Processes

The HEI's organizational structure refers to the school setup which consists of work assignment and delegation of duties and is graphically presented in its organizational chart. To better respond to growth, organizations transform their structures from centralized to decentralized form (Simons, 2000). According to Greiner (1998), it is impractical to centrally control growing organizations. The transition is necessary, since top management cannot be overwhelmed with details and has to delegate authority to managers (Flamholtz, 1996).

The HEIs' management control processes—strategic planning, budgeting, and performance measurement and evaluation (Anthony & Govindarajan, 2007)—also transform from informal to formal processes. Strategic planning pertains to the HEI's activity of setting its long-term goals and objectives and deciding on the strategies or programs to accomplish them. Budgeting follows strategic planning; it is the HEI's process of allocating resources for its planned activities. Performance measurement and evaluation involves measuring the HEI's actual performance with planned performance and evaluating the outcomes. Davila (2005), Greiner (1998), and Flamholtz (1996) stressed that organizations adopt formal management control processes and practices as they experience growth.

Use of Reward System

Anthony and Govindarajan (2007) recommended the use of a reward system in the MCS to motivate managers in performing for the best interest of the organization. In the academic context, Lisensky (1988) stated that since higher education is an intensely human enterprise, it follows that mechanisms should be incorporated to reward those who implement desired changes. Merchant (1998), however, proposed that rewards come in two forms—positive rewards and negative rewards or punishments.

Benefits of Transformed MCS

The organizations' use of evolving management control systems facilitates organizational growth (Merchant, 1998; Anthony & Govindarajan, 2007; Ramanathan & Hegstad, 1982; Greiner, 1998). These control systems are used to overcome the limitations of the early use of informal management approaches where personal and constant interaction and intervention by the manager is required (Greiner, 1998; Davila, 2005; Flamholtz, 1996; Simons, 2000).

According to Simons (2000), the controls used must be "phased in over the life cycle of the firm to effectively balance profit, growth, and control" (p. 309). He added that as the organization grows larger, informal processes become inadequate. Thus, for it to survive, the informal control systems must be formalized. The formal system provides for efficient goal achievement over the life cycle of the firm (Simons, 2000).

Therefore, the use of relevant and formal management control systems promotes both organizational growth and attainment of the organization's goals and objectives.

Methodology

Qualitative in design, this research adopted the case study method, an approach which, according to Yin (2009), is appropriate in examining and understanding the depth and richness of the phenomena within the real-life context. The study involved the cases of three private, non-profit HEIs located in the Province of Pampanga whose varied experiences and circumstances, to use the terminology

of Creswell (2013), reflected different perspectives ideal in qualitative research. The purposive sampling initially included all the five homegrown, private nonprofit HEIs in Pampanga, which have been operating for more than 35 years and offer complete basic education up to graduate programs. Unfortunately, only three HEIs responded to the author's requests for interviews.

The Cases

The three HEIs, hereinafter referred to as HEI 1, HEI 2, HEI 3, are all organized and registered as non-stock, non-profit educational institutions and have remained as such since the start of their operations. They possess rich academic histories and are known to have spearheaded the provision of learning in their immediate communities. They proved to be resilient amid the past economic downturn in the province caused by the eruption of Mt. Pinatubo and the pullout of American military troops from Clark Air Base. They also showed this resiliency when the K to 12 Program was implemented, which resulted in a lag in their enrolment for two academic years (2016 to 2018).

These schools have been operating for more than 35 years and exhibit the characteristics of organizations which have undergone the growth stages proposed in this study. Their organizational structures consist of multiple academic and administrative departments, which characterize the required structure for the use of a management control system. In addition, they have existing accredited academic programs and institutional and professional linkages which manifested their capacity to pursue quality goals. Two have earned university status from the Commission on Higher Education (CHED) and also International Organization for Standardization (ISO) accreditation from an external international certification and training body. All have an existing Center of Development (COD) status conferred by CHED.

HEI 1 is considered the first Catholic school in the country pioneered by the laity. It was founded by a member of a prominent family in the province and is currently headed by its eighth president. It was granted its university and autonomous status in 1981, and it earned its ISO 9001:2015 accreditation in 2019 for all its units and departments. This accreditation is the international standard for quality management systems. HEI 1 also has

accreditations from the Philippine Accrediting Association of Schools, Colleges and Universities (PAASCU) and the Philippine Association of Colleges and Universities Commission on Accreditation (PACUCOA).

HEI 2, the youngest among the three HEIs, started as a family undertaking then evolved into a non-stock, nonprofit college foundation. It pioneered the offering of a bachelor's degree in computer science in Region 3. It currently has three satellite campuses, one located within the province and two in the National Capital Region. Since its initial operations, it has had only two presidents. It was granted a Center of Development status for its Bachelor of Science in Information Technology program and has bachelor's degree program accreditation from PACUCOA.

HEI 3 is an archdiocesan Catholic school, the oldest in Asia. As such, it installed members of the Pampanga clergy as school heads and is now headed by its sixth president. Granted university status in 1980, it earned its ISO accreditation for its quality management system in 2016, the first to receive one among educational institutions in Central Luzon. Almost all of its programs are PAASCU-accredited.

Research Instruments

Profiling questionnaires, in-depth interviews, archival records, documentations, and direct observations were used in gathering the data needed for this research. The use of multiple sources of information satisfied the triangulation requirement for case studies and helped address the problems of establishing construct validity and reliability (Yin, 2009).

Data Collection Procedure

Initial information about the HEIs was obtained from the schools' websites. Letters of request for interview were emailed or handed personally to the office of the school president. The interviews comprised the primary source of information. For this paper, the interview questions asked were: (1) What types of management controls were adopted in the HEI's stages of organizational development? (2) Why were these types of controls chosen? (3) How did the controls, organizational structure, and

management control processes evolve through the HEI's stages of development? (4) How did the reward system work in the HEI, and (5) What are the benefits of the formal MCS on the HEI's performance?

Semi-structured interviews were conducted separately with two representatives of each respondent school to satisfy the triangulation of information derived from them. These representatives included high-ranking officials deemed knowledgeable about the history, administration, policies, and management processes—both past and present—of their respective schools.

On the day of each interview, an informed consent form and a profiling questionnaire were accomplished by the HEI representatives. Upon consent, a digital recorder and a video camera were used to capture all the interviewee's responses. Each of the six interviews lasted between 47 minutes to one hour and 44 minutes.

Data Analysis

Creswell's (2013) and Yin's (2009) frameworks were used in analyzing the evolution of MCS in the three HEIs. The individual case findings were analyzed and categorized to form the within-case themes drawn from the verbatim responses of the HEIs' representatives. These themes were analyzed using cross-case synthesis to draw cross-case conclusions about the schools.

Discussion

The findings that are presented and discussed are based on the framework used in the study.

Evolution of MCS in the HEIs' Stages of Development

The HEIs' stages of development were characterized by significant accomplishments in their provision of educational services, which included both physical and academic improvements. The schools' representatives referred to these stages as milestones. These milestones also showed the use of management controls and control processes which comprise the MCS, and how they evolved

from informal to formal adoption. The stages also pointed to the transformation of the organizational structures from centralized to decentralized form and how the reward system was used in each stage.

Milestone 1: Initial Operations. This marked the start of operations by the school founders. The schools started with a few students and there existed ad hoc supervision. Cultural and personnel controls were initially adopted and used informally. There were no documents on file regarding the use of planned controls at this stage. All the interviewees believed, though, that the mission statement existed, since it was required from a school to guide its operation. This served as one of the cultural controls while the selection of qualified employees was a personnel control. All three HEIs included dress codes and leaders setting the cultural atmosphere through their behaviour and language as important cultural controls. HEI 3 also included spiritual activities such as retreats and recollections.

There was informal use of management control processes in all the HEIs. This is typical for small organizations; as Flamholtz (1996) stated, where the work planning process is typically informal, no explicit goals or standards are set, and performance appraisal is casual and intermittent. The organizational structure was centralized in form, as it was the president who was overseeing the daily operations, making decisions and personal interventions.

Milestone 2: Growth in Operations. This stage was characterized by an increase in student enrolment, academic offerings, and additional controls used. Interviewees from HEI 1 stated that they still did not have any formal organizational structure then and no Personnel or Human Resources Department, although some standard operating procedures and segregation of duties existed and served as action controls. According to them, there was also no formal curriculum of academic offerings in existence. HEI 2 representatives mentioned that they had recruitment guidelines, employee manuals and some training programs, but these were informally used. Periodic meetings and discussions among school managers were held but only as needed. All schools included the vision statement in this milestone stage. It was during this stage that the HEI 3 president was relentless in his vision of having their school elevated to a university. All the HEIs also included as results controls

the use of budgets, students' performance, and board exam results (except HEI 2 which was not yet offering courses requiring board exams during this stage).

Thus, all types of controls were used informally in this milestone stage as well as the management control processes—planning, budgeting, and performance measurement and evaluation. A representative from HEI 1 shared that their budgeting activity was primarily between the Finance department and top management only. Also during this stage, the schools' organizational structures were still centralized.

Milestone 3: Expansion and Quality Quest. This stage indicated the school's physical expansion and pursuit of quality in academic offerings through accreditation or application for Center of Development or university status from CHED. This is when the schools established their Human Resources Department and started designing into formal use their personnel controls. Because of accreditation requirements, the schools reviewed their controls and adopted better controls. The HEIs started transforming to formal use their cultural, action, and results controls. Written guidelines and procedures came into existence. As the schools expanded their operations, more layers in their organizational structures were added. Gradually, authority was delegated to the department heads and the organizational structure was designed into a decentralized form. Planning also evolved into formal strategic planning. The other management control processes started to be formalized.

Milestone 4: Formalization and Quality Initiative. This denoted the schools' quality initiatives as evidenced by accreditation of more academic programs or an ISO accreditation. The formal management control system was implemented to facilitate the accomplishment of the HEIs' quality goals. Management controls and control processes were formally used, and their organizational structures were decentralized.

The interviewees were asked to describe their HEI's transformation of controls and processes into a formal management control system. A representative from HEI 2 narrated how the school had been planning bigger and higher achievements. It had gone through being a Computer College to a Computer College Foundation and was able to establish satellite schools in other areas.

Through all these, management controls played a major role in attaining the HEI's plans. The representative said: "In Milestones 1 and 2, we only had ad hoc controls, use of trial and error, constant monitoring. In Milestone 3, formal controls were adopted, refined in Milestone 4. With formal controls…working without management's constant monitoring of actual performance."

A representative from HEI 3 shared how their management control processes transformed across their school's development stages. According to him, strategic planning was informal in the early milestone periods since there were no formal documentations on file. He related that the planning activity started in their third milestone stage and was formalized in Milestone 4, with strategic plans laid out in years where the latest was made in 2018. The budgeting process was formalized in Milestone 4, with department heads submitting their budget proposals for discussion with the budget committee for priority ranking and adjustments if needed. There exists now a budget committee which monitors each department's budget and furnishes each with a performance report. As to performance measurement and evaluation, this process was formalized in Milestone 4 as required by accrediting agencies. He added: "In the past, these were taken for granted but these are now being monitored and required by accrediting agencies like the ISO. (We) need to 'professionalize' processes."

For HEI 1, the representatives said it was inevitable for the school to evolve their use of management controls as the school was developing. Better controls were needed in each of the HEI's milestones. The succession of presidents saw the transformation from informal to a formal control system. Each leader was equipped with his/her own organizational skills and faced with differing circumstances. Each acted as he/she deemed best for the institution. There was "transformation of management processes through the years up to academic excellence." The representatives added that the HEI's consistent quest for quality transformed its organizational structure and its controls and control processes, institutionalizing them into a formal management control system.

Table 1 shows the detailed descriptions of the HEIs' development stages or milestones.

Table 1

HEIs' Development Stages/Milestones

	HEI 1	HEI 2	HEI 3
Initial operations stage	Milestone 1: Start of operations by the school founder	Milestone 1: Start of operations by the school founder	Milestone 1: Start of operations by the school founder
Growth in operations stage	Milestone 2: Increase in student enrolment and academic offerings	Milestone 2: Increase in student enrolment and academic offerings	Milestone 2: Increase in student enrolment and academic offerings
Expansion and quality quest stage	Milestones 3: Physical expansion, accreditation of academic programs, granting of university status	Milestone 3: Physical expansion, recognition of graduate program, COD application for IT course	Milestone 3: Physical expansion, accreditation of programs, granting of university status
Formalization and quality initiative stage	Milestone 4: Formal structure, formal strategic planning, formal budgeting, evaluation formalized, documentation of control processes, use of balanced scorecard, international benchmarking, local and international accreditations	Milestone 4: Formal structure, formal strategic planning, formal budgeting, evaluation formalized, use of benchmarking, accreditation of programs	Milestone 4: Formal structure, management controls and processes, ISO accreditation, Almost all academic programs accredited

Table 2 presents the specific controls used by the HEIs in their milestone stages under the categories of cultural, personnel, action, and results controls. The controls evolved from informal in the early milestone stages to formal use with the schools' adoption of a formal MCS.

Table 2

Types of Controls Used by HEIs in their Milestone Stages

Types of Management Controls	HEI 1				HEI 2				HEI 3			
	M1	M2	M3	M4	M1	M2	M3	M4	M1	M2	M3	M4
Cultural Controls: Mission statement	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vision statement		✓	✓	✓		✓	✓	✓		✓	✓	✓
Codes of conduct/ethics		✓	✓	✓			✓	✓	✓	✓	✓	✓
Corporate credos/general statements of corporate values			✓	✓			✓	✓				✓
Statement of commitment to stakeholders			✓	✓			✓	✓				✓
Dress code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Leaders setting the cultural atmosphere through language/vocabulary used and behavior exemplified	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Others added: Spiritual activities e.g. retreats, recollections									✓	✓	✓	✓
Personnel Controls: Selection and placement of employees	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Recruitment guidelines/staffing policies and procedures		✓	✓	✓		✓	✓	✓			✓	✓
Employee manuals		✓	✓	✓		✓	✓	✓			✓	✓
Formal training programs/skill development programs			✓	✓			✓	✓			✓	✓
Informal training or mentoring programs		✓	✓	✓		✓	✓	✓		✓	✓	✓
Action Controls: Segregation of duties		✓	✓	✓		✓	✓	✓		✓	✓	✓
Work assignments		✓	✓	✓		✓	✓	✓		✓	✓	✓
Observance of standard operating procedures			✓	✓			✓	✓				✓
Periodic meetings/discussions		✓	✓	✓		✓	✓	✓		✓	✓	✓
Direct supervision or constant monitoring			✓	✓			✓	✓		✓	✓	✓
Project/program status reporting			✓	✓			✓	✓				
Checking of attendance, hours of work, breaks			✓	✓						✓	✓	✓

Results Controls: Budgets, performance standards or targets		✓	✓	✓		✓	✓	✓		✓	✓	✓
Surveys from stakeholders			✓	✓			✓	✓				✓
Evaluations/reviews			✓	✓			✓	✓				✓
Students' grades/performance		✓	✓	✓		✓				✓	✓	✓
Board exam results		✓	✓	✓			✓	✓		✓	✓	✓
Research publications			✓	✓								✓
Others added: Balanced scorecard				✓								

Determinants of Emerging Management Controls

Strategic Thrust. The schools' strategic thrust toward quality to differentiate their services required them to choose controls appropriate to this direction. An HEI 1 representative related:

> They were chosen for tighter and better controls due to current demand for accreditations. Now we need to produce measurable results using metrics, determine future behavior and how much effort to exert with present metrics. With a 2 now, then be a 3 next time. We measure through the controls.

School Expansion. The schools also had to adopt the chosen controls to efficiently and effectively manage their growing institutions in terms of their increasing infrastructures, physical improvements, personnel, course offerings, and enrollees. Autonomy was delegated to the heads who were empowered and made accountable. This called for imbedding needed controls into the expanding organization. An HEI 3 representative said:

> As the university grew, there was the need for more personnel, therefore the need for more formal offices…Became more complex at the end in terms of vice-presidents. Now the heads multiplied, so the need to segregate offices because of the increase in people. Academic cluster is the largest, so the need for assistant vice-president for academic affairs. Empower them (the heads) and they're accountable.

School Heads Turnover. Moreover, the turnover of school heads also determined the emerging management controls. This was the case of HEI 1, which had seen eight presidents through its years of existence. Each time a new president took the helm of leadership, he/she revisited the mission statement and put forth a new strategic plan for the school. Controls and control processes, which he/she deemed suitable, were implemented.

Use of Reward System

The reward system for school managers is one component of the HEIs' MCS to motivate and influence desired behavior in achieving the organization's goals. The types of rewards were mainly based on the school heads' performance and accomplishments. Some were given based on the heads' position and authority. When asked about any type of penalty, all representatives said their schools did not specify any penalties. Non-accomplishment of the targets meant non-receipt of rewards. Rewards were given in each of the HEIs' milestone stages except in Milestone 1 or the initial stage of operations. Table 3 shows these types of rewards which form part of the HEIs' reward system.

Table 3
Types of Rewards Used by the HEIs in their Milestone Stages

Types of Rewards	HEI 1				HEI 2				HEI 3			
	M1	M2	M3	M4	M1	M2	M3	M4	M1	M2	M3	M4
Salary increase		✓	✓	✓		✓	✓	✓		✓	✓	✓
Bonus or other monetary compensation							✓	✓			✓	✓
Fringe benefits or perquisites: Housing						✓	✓	✓				
Vehicle service			✓	✓		✓	✓	✓			✓	✓
Life insurance			✓	✓			✓	✓				
Health insurance			✓	✓			✓	✓			✓	✓
Improved work place/ environment		✓	✓	✓		✓	✓	✓			✓	✓
Designated parking space			✓	✓		✓	✓	✓			✓	✓
Vacation trips			✓	✓			✓	✓				

Others added											
Educational benefit		✓	✓	✓		✓	✓	✓			✓	✓
Transportation, meals, communication allowance			✓	✓								
Allowance for vacation trips							✓	✓				
Flexible time schedule											✓	✓
Job security/tenure			✓	✓			✓	✓			✓	✓
Promotions			✓	✓			✓	✓			✓	✓
Recognitions			✓	✓			✓	✓			✓	✓

Benefits of Formal MCS

The formal MCS resulted in efficient management of organizational growth. As the services they offered expanded, the HEIs had to add more functions and delegate more tasks. Thus, they evolved their organizational structures into decentralized ones, necessitating the evolution of controls. The formalized controls identified clearer roles and responsibilities to the heads and set performance standards which formed the basis for measuring and evaluating performance. Since the management control processes were formalized, there was greater coordination of activities within the HEIs.

From the interviews, there was manifest commitment from all three HEIs to accomplish their goals and objectives. This was evident in the schools' physical growth, increased student and personnel population, and increased accreditations. In addition, they enjoyed the trust of their partner industries and the recognition given by their communities. The HEIs' representatives shared that their formalized control systems made possible these accomplishments. One of them said:

> So now that we have shifted from informal to formal procedures or processes, and authority was delegated, it has become beneficial to the performance of the whole organization. Unlike informal, something you take for granted or assumed…Now we exercise little supervision [since we have] existing guidelines.

The formal MCS gave clear authority and participation in decision-making to school managers, which empowered and motivated them to work for the HEI's overall objective. A

representative from HEI 1 shared: "We used to be only second-class citizens, but now we get to sit with the Board. There is support from top management…The heads (managers) are happy now. They're committed, they're satisfied."

The formal structures also generated positive work values among the school heads. Explicit and implied were commitment, job satisfaction, cooperation, and positive attitude. The interviewees mentioned the words: "happy", "committed", "satisfied", "love work", "open heart", "accomplishing mission together", "forgiving", "working like brothers and sisters", "look forward [to] working every day".

MCS Transformation Model

From the three cases in this study, a proposed model for the transformation of management control systems in private non-profit HEIs is presented in Figure 1. It shows the evolution of controls and control processes across the HEIs' stages of development, the transformation of their organizational structures, the transition of their MCS to a formal one, and the use of a reward system.

The model may serve as a guide to school administrators in managing their organizational transitions. It can direct them in the use of appropriate controls, help them determine how their organizational structures and control processes should transform, and show them how to respond effectively to conditions resulting from the HEIs' changing environment.

Figure1. MCS Transformation Model for Private Nonprofit HEIs.

Conclusion

The study validates the need for HEIs to evolve their control mechanisms and processes and transform them toward a formalized MCS to stay on course in capably fulfilling their goals. The formal MCS significantly promotes the development of the HEIs' sustainable capacity in achieving their quality goals, and allows them to be better equipped to respond positively to the opportunities provided by their external environment. Positive responses can be accomplished by offering relevant courses that meet the needs of their communities and by collaborating on programs and research projects that will maximize benefit to all stakeholders. The collaboration of HEI 1 with the Department of Science and Technology (DOST) to help Pampanga furniture manufacturers resulted in the production of a patented foam shredder machine. HEI 2 partnered with other schools and shared the use of its modern IT infrastructure with their students to better equip them. HEI 3 collaborated with DOST and giant lantern manufacturers in developing a prototype for cost-efficient sequencers for commercial giant lanterns.

The results of this study add to the body of knowledge pertaining to the importance of management control systems in the HEIs' pursuit of quality goals, the use and transformation of MCS as HEIs evolve through their development stages, and the specific benefits of MCS on the performance of the HEI. The study provides a framework for MCS in the context of organizational growth for non-profit private HEIs to fill the gap existing in this area of management control in the Philippine setting. It does not, however, aim to generalize its findings but encourages other researchers to extend this research to HEIs outside Pampanga or to private for-profit HEIs that will enhance the MCS perspective in these growing institutions.

References

Anthony, R. N. (1988). *The management control function.* Boston: Harvard Business School Press.

Anthony, R. N. & Govindarajan, V. (2007). *Management control systems.* New York: McGraw-Hill.

Ballaran, J. (7 Dec 2017). *Clark Freeport is ideal investment destination in Luzon--Duterte*. Retrieved from http://newsinfo.inquirer.net/950641/economy-palace-duterte-clark-freeport-zone#ixzz59dPh1SMU

Beltran, C. (2017, November 19). Pampanga: 'Field of Dreams'. *The Philippine Star*, p. 8.

Cardinoza, G. (2018, January 27). National gov't center to rise in Clark City. *Inquirer.net.* Retrieved from http://newsinfo.inquirer.net/963882/national-govt-center-to-rise-in-clark-city

Clark Development Corporation (2019). *2019 Management report.*

Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches.* California: Sage.

Davila, T. (2005). An exploratory study on the emergence of management controlsystems: Formalizing human resources in small growing firms. *Accounting, Organizations and Society, Vol. 30,* p. 223-248. Retrieved from http://eprints.undip.ac.id/5070/1/An_exploratory_study.pdf

Ferreira, A. & Otley, D. (2009). The design and use of management control systems: an extended framework for analysis [PDF file]. *Management Accounting Research 20(4),* p. 263-282. Retrieved from http://isiarticles.com/bundles/Article/pre/pdf/16622.pdf

Flamholtz, E. G. (1996). *Effective management control: Theory and practice* Massachusetts: Kluwer Academic.

Franco-Santos, M., Rivera, P. & Bourne, M. (2014). *Performance management in UK higher education institutions: The need for a hybrid approach* [PDF file]. Retrieved from http://www.som.cranfield.ac.uk/som/dinamic-content/news/documents/PerformanceManagementinUKHigherEducationInstitutions.pdf

Garcia, M. H. S. (2016). *Management framework of metamorphosing schools.* Unpublished dissertation. College of Education, University of the Philippines-Diliman, Quezon City.

Greiner, L. E. (1998). Evolution and revolution as organizations grow. *Harvard Business Review, May-June 1998 issue,* p. 55-64. Retrieved from https://hbr.org/1998/05/evolution-and-revolution-as-organizations-grow

Hofstede, G. (1981). Management control of public and not-for-profit activities. *Accounting, Organizations and Society, Vol. 6, No. 3,* pp. 193-211. Retrieved from http://pure.iiasa.ac.at/id/eprint/1565/1/RR-82-45.pdf

Lisensky, R. P. (1988). Integrating the control systems. *New Directions for Higher Education, 64,* p. 15-22.

Maciariello, J. A. (1984). *Management control systems.* New Jersey: Prentice-Hall.

Malindog-Uy, A. (13 September 2020). *"Build Build Build"Program Amid a Pandemic.* Retrieved from https://theaseanpost.com/article/build-build-build-program-amid-pandemic

Mawis, S. M. D. (28 July 2018). *Understanding the 'Build, Build, Build'Program.* Retrieved from https://business.inquirer.net/254682/understanding-build-build-build-program#ixzz6aGmeYzBk

Merchant, K. A. (1998). *Modern management control systems.* New Jersey: Prentice-Hall.

Merchant, K. A. & Van der Stede, W. A. (2012). *Management control systems: Performance measurement, evaluation and incentives.* Boston: Harvard.

Miller, D. & Friesen, P. H. (1984). A longitudinal study of the corporate life cycle. *Management Science, Vol. 30, No. 10,* p. 1161-1183. Retrieved from http://dx.doi.org/10.1287/mnsc.30.10.1161

Philippine Business for Education (2011, April 7-8). *The role of private higher education in the Philippines.* Report of Conference on the Role of Private Higher Education, Metro Manila, Philippines. Retrieved from http://pbed.stiltify.com/media/W1siZiIsIjIwMTEvMDUvMTIvMjEvMjIvMjgvNDkxL1JvbGVfb2ZfUEhFX1JlcG9ydC5wZGYiXV0/Role%20of%20PHE%20Report.pdf?sha=5bf6562a

Porter, M. (2007). Colleges and universities and regional economic development: A strategic perspective [PDF file]. *Forum for the Future of Higher Education,* 41-44.   Retrieved from http://forum.mit.edu/wp-content/uploads/2017/05/ff0710s.pdf

Ramanathan, K. V. & Hegstad, L. P. (1982). *Readings in management control in nonprofit organizations.* New York: Wiley & Sons.

Shirley, R. C. (1988). Strategic planning: An overview. *New Directions for Higher Education, 64,* 5-14.

Simons, R. (2000). *Performance measurement & control systems for implementing strategy.* New Jersey: Prentice-Hall.

Yin, R. K. (2009). *Case study research: Design and methods* (4th ed.). California: Sage.

Coping with the Transition to Remote Learning: The Experiences of Tertiary Level Business Educators in Angeles and in Clark, Pampanga

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ABSTRACT

The lived experiences of 25 business educators who transitioned to teaching remotely during the 1st Semester of Academic Year 2020-2021 in tertiary level academic institutions in Angeles and in Clark, Pampanga were examined in this study. The themes that emerged from the educators' narratives include issues on connectivity and access to compatible devices, sudden transition into remote learning, a one-way stream of learning and maintaining student interest, and the toll on educators' over-all well-being. To cope with these challenges, these professors adopted several methods such as advance recording of lessons, conducting synchronous classes via conferencing platforms, adjusting assessment tools to suit online delivery, and capacitating themselves through webinars and training. Moreover, to feel supported by their institutions, these business educators suggested that Higher Educational Institutions (HEIs) assist them by securing access to stable internet and procuring compatible devices like laptops and tablets, granting access to educational resources online, and showing concern for their overall health and well-being. Remote learning has transformed the usual delivery of education. While it has long been an alternative education modality, the initial experiences of these business educators have reinforced its applicability especially in teaching during the COVID-19 pandemic.

Keywords: remote learning, business education, phenomenology

Introduction

The onslaught of COVID-19 in the Philippines has affected every facet of living, from the conduct of business and education to daily human interaction. In fact, it has disrupted lives and has generated new modalities of dealing with what used to be normal before the pandemic. COVID-19 forced tertiary-level business educators to confront challenges that required the transition from the normal procedures of education to the use of remote modalities of administration, teaching, and learning.

The education industry is one of the most severely affected by the COVID-19 pandemic. This virus, likened to the 1918 and 1957 flu pandemics in terms of death rate, led to the promotion of Remote Learning (Ebrahimi, et.al., 2020), a modality of learning suitable for situations wherein the classroom setting is not possible due to either differences in time or distance between the instructor and student (Remote Learning, n.d.). This modality was seen as a suitable approach because physical or residential classes were temporarily prohibited to prevent the dangers posed by COVID-19.

A great number of countries saw remote learning as an opportunity and temporarily switched to online learning, a form of remote education that makes use of the internet (Ebrahimi, et. al., 2020). Online learning may be categorized into synchronous or asynchronous. While both categories use online platforms, they differ in terms of the manner of instruction. Synchronous learning happens in real-time; the professors deliver their lessons using an online platform such as Zoom or Google Meet. On the other hand, asynchronous learning is not tied to instructor-student concurrent interaction (Synchronous Learning vs Asynchronous Learning, n.d.). In this modality, the students learn independently by accessing modules and videos uploaded by their instructors to a Learning Management System (LMS).

While this shift to remote learning was seen as necessary, many educators found themselves ill-equipped for the transition. With minimal to no training, professors needed to swiftly make their courses appropriate for remote instruction. The most common strategy used by educators was to transfer their existing courses into an LMS while holding synchronous classes. The professors' teaching strategies, activities, and learning outcomes remained the

same. It was reported, however, that their assessment tools were modified by revising the format of exams and decreasing the number of requirements (Lederman, 2020).

In the Philippines, debates ensued whether or not to freeze the academic year. This is for the reason that most students, unfortunately, have an unstable internet connection and unequal access to devices used for online learning, such as laptops and tablets (Hallere, 2020). To address this, the Department of Education (DepEd) implemented a Basic Education Learning Continuity Plan (BE-LCP). The government agency called on its teachers to be innovative and resourceful in delivering quality education. The BE-LCP aims to ensure that the opportunity to learn is equally and safely provided to students through different learning modalities. Learning resources both print and non-print were provided through alternative delivery methods with the supervision of an adult (parent or guardian), and monitoring and guidance of teachers (Dep Ed, 2020a). Furthermore, DepEd deferred the official opening of classes to October 5, 2020. This was to give way for the necessary preparations for the shift into these new modalities and to address gaps to successfully start modules in the context of the BE-LCP (Dep Ed, 2020b). Meanwhile, the Commission on Higher Education (CHED) gave the heads of Higher Educational Institutions (HEIs) the discretion to ascertain the situation in their campuses as well as prescribe or adapt solutions for remote learning, be it online learning or other alternative modes in place of the usual classroom delivery (CHED, 2020).

Methodology

Using a qualitative approach, this study was framed with Interpretivism as its philosophical underpinning. It also employed a phenomenological case study research design.

According to Morrow, et al. (2020), phenomenology in a descriptive qualitative design is useful in areas where there is little existing literature. Because there is a scarcity of research regarding how educators coped with the remote learning challenges experienced during the shift into this modality (Creswell, 2012), those who have lived this experience could provide the information instead.

By the same token, a case study design is suitable when examining an object, person, program, or phenomenon (Merriam, 2009) such as how these educators experienced challenges in having to abruptly transition into using remote modality to be able to continue teaching their students during the 1st semester of the Academic Year 2020-2021. More importantly, this study looked into the methods they adopted to be able to deal with these challenges.

Shosha's framework, an adaptation and a condensed version of the Colaizzi Method of Data Analysis, shown in the figure below, was used in processing the data gathered for this study.
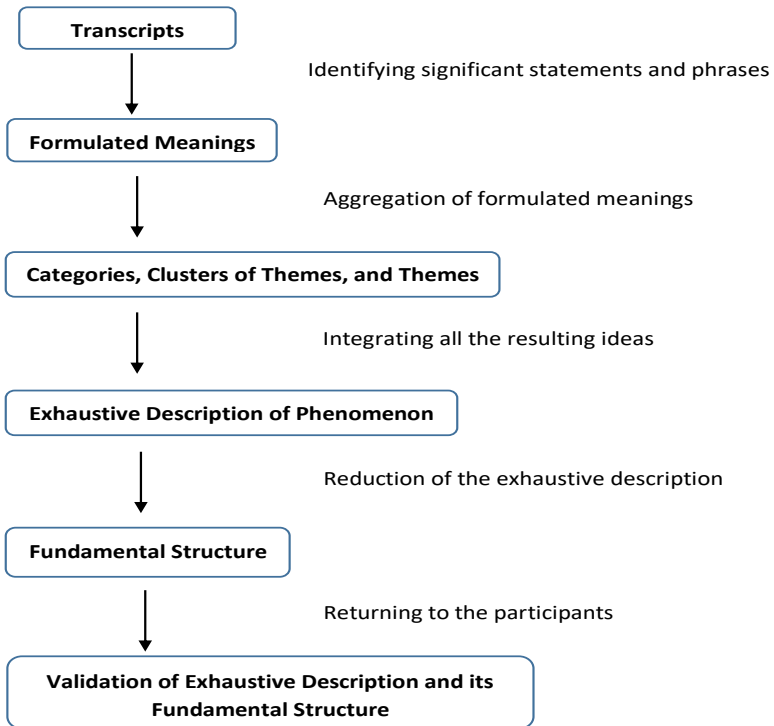
Transcripts

Identifying significant statements and phrases

Formulated Meanings

Aggregation of formulated meanings

Categories, Clusters of Themes, and Themes

Integrating all the resulting ideas

Exhaustive Description of Phenomenon

Reduction of the exhaustive description

Fundamental Structure

Returning to the participants

Validation of Exhaustive Description and its Fundamental Structure

Figure 1. *Shosha's Adaptation of Colaizzi's Method of Data Analysis (2012)*

This qualitative framework was chosen as the paradigm through which this study was formulated for its exacting and meticulous nature as a process aside from the credibility and reliability of its results. Using Shosha's framework in analyzing these narratives leads not only to the detection of emerging themes but also to the discovery of these themes' interconnected relationships (Wirihana, et al., 2018).

Using the above framework, the author processed the responses from the participants as follows: as soon as all the narratives were received, transcripts were coded using a spreadsheet. In cases where the author encountered vague answers, participants were re-contacted, mostly through phone calls although emailing and Facebook messaging were also utilized for clarification.

Information was analyzed, first by noting the repeated responses shared by the participants. These responses were then grouped into clusters based on their similarity in context and words used. From this, the author discovered several emerging themes which are presented in this study. After integrating all resulting ideas and writing an exhaustive description to elaborate on the lived experiences of the participants, the author presented these findings to the participants, which the participants validated through email correspondence. A majority of the participants have responded in agreement with the resulting themes presented in this study, thereby validating the results of this research.

Data Collection

Due to the ongoing lockdowns throughout the 1st Semester of the Academic Year 2020-2021, information from the participants was gathered through a semi-structured, written interview administered online using Google Forms.

The researcher wanted to identify the challenges encountered by educators teaching business courses since they were left with no choice but to transition to teaching remotely. Likewise, the author was curious whether the participants experienced challenges that may be specific to teaching business subjects. The author was also interested to find out what methods these business educators adopted to cope with these said challenges and how these professors

thought their academic institutions might provide support to fully address the difficulties that they encountered during this period.

Sampling

Similar to snowball sampling, participants were chosen through networked connections among peers in the collegiate education community in Angeles and in Clark. However, since this research employed a qualitative phenomenological research design, non-probability sampling was used. The initial participants were targeted purposively since the researcher is after understanding these business educators' experiences as they faced the challenges of coping with the sudden shift into remote modality. Purposive convenience sampling, a type of non-probability sampling is common in qualitative research designs since qualitative researchers rarely fix their sample size; rather, they usually determine their cases gradually by adding more participants until the point of saturation (Ishak & Bakar, 2013). Saturation is reached when the added participants no longer give new information that could lead to the discovery of other themes (Saunders, et.al, 2017).

While non-probability convenience sampling is disadvantaged in terms of generalizability when judged against probability sampling, the former is the standard within developmental science and will likely continue to be the norm for its advantages in examining developmental questions compared to unsuitable and usually costly probability sampling techniques (Jager, et.al, 2017). Moreover, in qualitative phenomenological studies, the discovery of the phenomenon is illuminated from the participants shared experiences, and not from inference for the whole population given a sample (Ishak & Bakar, 2013).

Furthermore, using non-probability convenience sampling is more efficient especially when the researcher has finite resources, particularly time and workforce (Etikan, et. al, 2016). Since the pandemic has hampered the researcher's mobility due to the lockdowns while this study was ongoing, non-probability convenience sampling demonstrated its usefulness in tapping available business educators who willingly participated in this research.

Participants of the Study

This research targeted business educators as participants. As a qualifier, each participant must have been teaching a business course (including economics and hospitality management subjects) for at least three years in the following higher educational institutions in Angeles and in Clark, Pampanga: Angeles University Foundation (AUF), Holy Angel University (HAU), City College of Angeles (CCA), and University of the Philippines Diliman Extension Programs in Pampanga and Olongapo (UPDEPPO). AUF, HAU, and CCA are the biggest tertiary education providers in Angeles City and as such could supply a representative number of participants for this research. Aside from CCA, professors from UPDEPPO in Clark, Pampanga were included as participants for the researcher to present a fuller picture of their lived experiences coping with the challenges of teaching remotely. This was done to include the experiences of professors teaching in public HEIs since AUF and HAU are both private academic tertiary institutions.

In addition, a minimum of three years of experience teaching business courses was used as a qualifier for the educators to noticeably determine how teaching remotely has challenged their usual pre-remote-learning teaching practices. Moreover, before this shift into remote learning, all the professors who contributed to this study have had no experience teaching online. However, during the course of this study, all had to conduct their lessons remotely using a combination of synchronous and asynchronous methods.

Initially, there were only ten professors who willingly shared their experiences during the start of the 1st semester of Academic Year 2020-2021. Towards the end of the semester, an additional fifteen business educators were recommended by their colleagues from the aforementioned HEIs, bringing the total to twenty-five participants.

The educators' age distribution is as follows: a majority (9) are aged 31-40, six (6) are aged 21-30, four (4) are aged 41-50, five (5) are aged 51-60, and one (1) aged 61-70 years old. In terms of which HEI they work for, the distribution of participants is as follows: seven teach at AUF, eleven are from HAU, five are from UPDEPPO, and the remaining two are from CCA. Of those teaching in AUF, one teaches economics courses, two teach accounting courses, one teaches marketing courses, one teaches management courses, and two teach

tourism management courses. Of the participants from HAU, one teaches business research, business statistics, and economics courses, another one teaches economics and management courses, two teach accounting, research, and taxation courses, five teach accounting courses, another teaches tourism and hospitality management courses, and one teaches purely economics courses. Of those from the UPDEPPO, one teaches human resources management and strategic management courses, one teaches accountancy and finance courses, another teaches economics and public management courses, another teaches economics courses including money and banking, and one teaches business law courses. Lastly, of the participants from CCA, one teaches economics and management courses, while the other teaches management, entrepreneurship, economics, business law, and business planning courses.

The subjects that these educators handle are core and professional major courses prescribed by the Commission on Higher Education (CHED) for business education degree-granting programs in the Philippines. Core courses involving basic knowledge that leads to the four functions of a business degree are subjects in the following areas: Human Resource Management, Operations Management, Marketing Management, and Financial Management. Professional major courses lay the fundamental concepts of business programs and are usually specialized subjects under the four basic areas. Tourism Management is an example of a professional major course, while Human Resources Management, Marketing, and Accountancy are examples of core courses. Economics, though not listed under any of the four core areas of business, is nonetheless a subject common to all business degree programs and is usually embedded in courses from the functional areas. These core and professional major business courses form the majority of the units required in a curriculum for a business degree. (CHED, 2017).

Given this information on the distribution of participants, the narratives were analyzed by clustering responses into two subgroups: age and the classification of HEI they work for, be it private or public.

Those whose ages are within the 21-40 year range, who for this study shall be termed junior faculty, were born in the digital age. As digital natives, they are well-versed in technology use and are

assumed to have transitioned into remote learning with less difficulty compared to the senior faculty. Senior faculty are those whose ages are within the range of 41-70 years old. Professors who belong to the senior faculty sub-group have been teaching for several years or even decades in a traditional setting and are presumed to find the shift to online platforms more challenging. Out of the twenty-five respondents, fifteen are junior faculty while the remaining ten are senior faculty.

Another subgroup considered in analyzing the narratives is the classification of the HEI the educators work for. The professors were grouped as to whether they belong to a private or a public academic institution regardless of whether they teach full-time or part-time. Educators in private HEIs are presumed to have access to more facilities that could aid them in teaching remotely such as a Learning Management System in place prior to this shift into remote learning. Additionally, it is assumed that private universities have more resources in terms of providing support to their employees. In contrast, the same may not be presumed for all public tertiary educational institutions since they only rely on government funding. The majority of the participants or a total of eighteen educators teach at private universities while the remaining seven are from public HEIs.

Looking at these sub-groups has helped assess if there were distinct challenges experienced or differing methods adopted by these educators depending on their age and the type of HEI they work for.

Findings and Discussion

This section elaborates on the emerging themes that were discovered in this study.

Remote Learning Challenges

Remote Learning has brought several challenges to educators in terms of how they can continue teaching despite the strict quarantines and suspension of residential classes. Among those faced by business educators in Angeles and in Clark, Pampanga during the onset of the COVID-19 pandemic were Issues on Connectivity and Access to Compatible Devices, Sudden Transition to Remote Learning Modality, One-way Stream of Learning and

Maintaining Student Interest, and Remote Learning's Toll on the Educators' Over-all Well-Being.

Theme: Issues on Connectivity and Access to Compatible Devices

> Connectivity is an issue. In general, our communication infrastructure is still far from being desirable (nation-wide), and this makes teaching quite challenging. (Participant 7)

This instability in terms of connection to the internet challenged the educators because they experienced "*difficulty contacting students especially those that don't go online,*" as relayed by another participant. In relation to this, an educator answered:

> Digital divide is one. Not everyone has [a] stable, fast internet connection. Some students missed scheduled activities because of this. The teacher has to repeat the lesson/activity so no one will be left behind. (Participant 25)

Teaching remotely through online platforms when both the student and the educators experience internet connectivity fluctuations was difficult because holding synchronous classes in this set-up is counter-productive. Instead of being able to discuss lessons, time is often consumed with having to re-log-in once disconnected, and this usually happens several times within a class. Also, some of the participants experienced frequent power interruptions which unavoidably impeded synchronous classes.

Aside from the internet and power connection issues, transferring content to suit these new platforms requires particular applications and compatible devices. Unfortunately, most professors do not have access to such teaching devices since running platforms like Zoom for example, require gadgets with higher specifications. One professor narrated:

> [In] teaching remotely thru online platforms, [one had to] teach oneself in the use of different platforms/apps/online tools, [had] to upgrade/purchase teaching devices, [used] gadgets to improve screen and voice projection. (Participant 3)

Moreover, updating, modifying, and uploading teaching resources in a work-from-home set-up led to longer working hours. This, according to Participant 21, resulted in their personal gadgets being overused. Hence, the professors had to shoulder costly repairs if not buy an altogether new device to be able to make decent lectures online. Without these gadgets (e.g., laptops, video cameras, microphones, editing software, etc.), the presentation of lessons online would be uninteresting if not difficult. This was especially true for business courses that rely heavily on calculations like Accounting, Finance, and even Economics. In these courses, educators must show how a particular problem set needs to be computed for the students to gain better confidence in solving it themselves. For the course Economics, aside from the computations involved in some lessons, graphs to denote shifts or movements of the supply and demand curves are almost always incorporated in their lessons. Teaching students online in such cases entails the use of additional software like Light Board and the need to procure hardware such as drawing tablets.

It was noted that a total of fifteen participants mentioned issues on connectivity and access to compatible devices as a challenge in teaching business courses in this remote set-up. Of these 15 participants, four are classified as senior and eleven are junior faculty. Likewise, four of these participants are teaching in public HEIs while the remaining eleven work in private universities. This finding indicates that regardless of age and classification of HEI where the participants teach, a significant number found internet connectivity issues and lack of compatible devices challenging during this shift into remote learning. This is because internet connectivity in the Philippines is still slow and intermittent at best which is dreadfully problematic for holding classes synchronously. Moreover, gadgets and laptops that would be suitable for use in this remote set-up are priced steeply, making them financially burdensome for the educators to procure without assistance.

Theme: Sudden Transition to Remote Learning Modality

Most of the professors received minimal training from June to July, training which could have prepared them to handle the transition to remote learning better. Because this transition happened abruptly, *"some professors do not even know how to make use of technology particularly the LMS,"* shared Participant 18. This is because some

are tech-averse and struggled to shift from the traditional classroom discussion to teaching remotely, be it in a synchronous or asynchronous modality. Another participant disclosed:

> Everything is online. The admin requires [us] to come up with materials for the learners. [We] need to adjust the content of the course to meet the new platform. [We] need to adjust how topics are delivered. (Participant 1)

Assessment tools like quizzes and exams also needed to be recalibrated for online delivery. With the sudden migration of lessons and assessment methods into the online modality, educators were stretched, having to update and modify their teaching resources to suit these new channels within a span of one to two months only. This is very little time considering it usually takes years to develop an online course.

A total of 13 participants, of which five are classified as senior and eight are junior faculty, considered the sudden transition to online modality of learning as one of the difficulties they had to face. Of these 13 participants, five are business educators in public HEIs while the rest are teaching in private universities. This shows that the suddenness of the transition into remote learning platforms was deemed challenging across all sub-groups be it in terms of age or classification of HEI. Initially, it was expected that junior faculty members and educators from private universities would transition through this shift into the remote set-up better. Unfortunately, despite the fact that the junior faculty participants are digital natives, they still found this abrupt shift as challenging as did their senior colleagues. This finding also reveals that while private universities may have facilities such as an LMS already in use prior to the shift into remote modality, the educators still found the process of migrating their teaching resources as grueling as did those from public HEIs.

One-way Stream of Learning and Maintaining Student Interest

According to Participant 11, with the shift into the remote modality of learning *"students are not enthusiastic during online classes, they are not that engaging (sic)."* For some reason, students adjust poorly:

[The] lack of interest [among] students in adapting ubiquitous and common use consumer electronics for academic purposes including software and service apps; [an] example [is] YouTube [which] is used for them to [learn] a new dance step to use for TikTok but to use it for a video research on history, interest is low. (Participant 15)

This same participant shared that this lack of interest *"to read prescribed materials and reliance on face-to-face video lecture[s] for their educational content consumption"* led to *"heavy reliance on a one-way stream of discussion"* instead of having conversational interactions which were common during face-to-face classes. Several other professors cited this lack of interest of the students or difficulty in maintaining their enthusiasm to learn as challenging. Furthermore, in a face-to-face set-up, it is easy to pinpoint who among the students are engaged during discussions. This is difficult to do in a remote setting, as mentioned by one participant:

[The] absence of FTF (face-to-face discussion) eliminates the "profiling" process of [checking whether] the concept is understood or not, which can be done FTF (face-to-face) by checking for clues, gestures, and non-verbal communication." (Participant 6)

Teachers rely on gestures and facial expressions to figure out who among the students perfectly understand the lesson, whose minds are busy daydreaming, and who are tentative to raise a question in class. Such cues are absent during asynchronous modality since the educators cannot see the students. Moreover, while the professors see the students online during synchronous classes, these cues are still not as clear as when class is facilitated in a residential setting. This is because although video conferencing allows seeing the facial expressions of the students, the educators are kept busy navigating these new platforms while holding discussions. To attempt to check on each student's screen for visual cues is not only difficult but also time-consuming. Add to that the many distractions which serve as a competition for the students' attention during synchronous classes such as the home being unconducive for learning or dogs barking and roosters crowing in the background.

One educator answered:

> Catching the attention of the students [is difficult]. No matter how well prepared the Professor or Instructor is, if the cycle of communication is not completed by any form of feedback (oral or written response) then there is no assurance that the instruction or teaching was effective. Add the barriers (noise, choppy lines etc.) on the part of the students that may hinder a seamless conduct of online instruction. (Participant 19)

Because this remote modality, in essence, promoted a one-way stream of learning, the students, as a consequence, were found to be less engaged in class discussions. A total of nine participants mentioned this challenge in their narratives. Three of these educators teach in public HEIs while the remaining six are from private academic institutions. Of these nine, four participants are senior faculty while the other five are classified as junior faculty. Hence, this finding shows that there was no perceived difference in terms of how educators lived through this challenge during the transition into remote learning. Both junior and senior faculty, regardless of where they teach, deemed the one-way stream of learning as uniformly challenging when maintaining student interest during the period of this study.

Remote Learning's Toll on Educators' Over-All Well-Being

Like other groups of people, educators have also become anxious during this pandemic, worrying not only about their personal health and safety but also having to consider the general well-being of their students. Participant 25 mentioned that *"the pandemic has made everyone more vulnerable and more sensitive."* Thus, professors *"need to be more patient in handling the students".* Most educators have recognized the need to exercise compassion in terms of the tasks they give their students to avoid contributing to the students' already high stress levels. This is because like their professors, the students were forced to study remotely and grapple with the demands of learning through an online modality. Aside from experiencing "Zoom fatigue" due to staying glued online for several hours attending synchronous classes daily, students found themselves needing to learn from piles of reading assignments. With these in mind, the educators had to set aside their personal stress

and anxiety while trying to strike a balance between the need to fulfill their role of facilitating learning and the need to be considerate to their students. This constant rebalancing of duties and consideration is stressful since educators had to incessantly rethink and adjust their teaching and assessing strategies. Because of this, educators like Participant 22 mentioned how *"staying motivated"* was challenging for them. Related to this, another stated:

> [This] pandemic is taking a toll on my physical and psychological wellbeing. [This] work from home set up [is] blurring the lines of work and rest. This is taking [a] toll on my holistic health. Our mobility has been reduced and it's affecting how we function as teachers. Home for me is a place where we can detach from work and it is a private place where we can just be ourselves. The work from home setting took that out from everyone." (Participant 8)

In a pre-COVID set-up, it was easy for these educators to separate their work from their personal lives. Because of the need to stay and work at home, the personal and professional aspects of their lives have inevitably mixed. Some educators had to move their working hours late at night up to the wee hours of the morning because they had to do tasks at home such as tending to the children during the day.

This particular challenge, the toll of online learning on educators' overall well-being, was disclosed by two junior faculty and one senior faculty who teach in private Higher Educational Institutions. Thus, the age of the educators was considered immaterial in differentiating the experiences of these participants living through this challenge. This finding came as a surprise since it disproved the presumption that educators in private HEIs receive more support from their organizations and were therefore presumed to have less difficulty transitioning into remote modalities of learning. In fact, no professor from public HEIs mentioned this as a difficulty they encountered while teaching remotely.

Challenges Unique to Teaching Business Courses

Based on the participants' responses, the challenges brought about by the perceived uniqueness of teaching business courses during the period of this study were negligible if any. Most of the participants' narratives point to general teaching challenges with a specific

application to a business background such as the need for students to be immersed physically in the field like going on practicums, doing laboratory work, and attending educational trips. These types of activities, if conducted remotely, will not have the same effect as when done in a traditional setting.

Moreover, some of the HEIs where the educators worked for disseminated memoranda ordering that professors temporarily avoid these types of requirements, particularly those that would require the students to go outside. Aside from adhering to memos from their HEIs, most professors decided to discontinue fieldwork to ensure the health and safety of their students. For laboratory work, professors had to be creative in recalibrating their requirements by allowing the show of practical skills such as bartending or cooking through video recordings.

Methods Adopted to Cope with the Challenges Encountered

Listed below are the methods adopted by business educators in Angeles and in Clark, Pampanga to cope with the consequential shift to remote learning during the onset of the Covid-19 pandemic. These methods were Video Recordings and Video Conferencing, Assessment Tools Adjustment, and Attending Webinars and Training.

Video Recordings and Video Conferencing

Most educators adopted a blended or a combination of synchronous and asynchronous modalities. A few, like Participant 18, uploaded pre-recorded videos of their lessons into their universities' LMS, and used Zoom meetings *"for integrating the discussion."* Zoom Virtual Meetings and Google Meet were the usual applications used for holding synchronous sessions via video conferencing. Participant 6 preferred this method because according to him "*at least we can see the face (of students). Though body language reading is not evident.*" Some like Participant 4, opted to record in advance, snippets of their lessons into videos to save time. Another made use of available *"2-minute clips, like that of Twitter, or at most (a) 10-minute short-form video in YouTube similar to [a] Crash Course or Ted [Ed] videos for lessons in economics."* These shared narratives are similar to what another educator disclosed:

> Technically, I resort to available resources from the web which are credible and reliable. Most importantly, I try to contextualize the topics with the current situation. I also do my own content for uploading so students can access them anytime. (Participant 7)

Together with other educational materials valuable for an asynchronous mode of learning, these videos are uploaded into the Learning Management System (LMS) prescribed by their academic institutions. These methods gave students the choice among attending a fully synchronous class, studying at their own pace asynchronously, or learning through a combination of both synchronous and asynchronous modalities.

A total of ten participants, seven of whom are junior while three are senior faculty, resorted to video recordings and video conferencing to be able to teach remotely. Of these ten, two teach at public HEIs while the remaining eight are employed as professors in private universities. This finding shows how professors, regardless of age and classification of HEI, similarly coped with the challenges of the transition. Since the professors could not meet their students in a residential setting, this method served as the primary means through which the situation was addressed whether the participants taught synchronously, asynchronously, or a combination of both.

Assessment Tools Adjustment

Given the new learning modality, the assessment methods educators were accustomed to using for residential classes such as quizzes, exams, and final papers about companies as case laboratories were rendered unbefitting. Participant 17 shared that "*we have to be innovative in thinking [of] what activities to give*". Educators needed to be more creative in coming up with intellectually stimulating requirements that would elicit the learning outcomes they intended without contributing to the growing anxiety of their students. A reduction in the number of requirements was done in consideration of the mental well-being of students and because the ongoing quarantine deterred students from being able to conduct fieldwork. Moreover, instead of the usual face-to-face presentation, one professor had to innovate:

In presentation in (sic) their product, I just instructed them to video record. (Participant 14)

This permitted the students to show how their products worked without having to rely heavily on synchronous meetings with their professors. Since not all students could afford to use the internet for lengthy online meetings, allowing recorded presentations was a very considerate alternative. Feedback about the students' presentation was provided by the professors later on, usually via email or through Zoom consultations. Lastly, exams were recalibrated to suit online delivery. Participant 9 opted for *"submission of soft copies."* In addition, most professors allowed longer time periods for submission to accommodate those who might be experiencing internet or power fluctuations. This, however, led educators to avoid objective types of exams and instead utilize more situational and essay types of tests. This was because administering these types of assessments was not only a better fit online but also because these methods could help minimize if not deter students from cheating by searching answers online.

The narratives presented above were recorded from four junior and three senior faculty who mentioned that they adjusted their assessment tools to address the challenges of needing to shift to remote learning. Of these seven participants, two are from public academic institutions and five are teaching at private HEIs. This finding shows that both junior and senior faculty teaching in either public or private HEIs made use of this method in coping with the transition. Thus, assessment tool adjustment was done across all sub-groups during this transition into remote modality, indicating no difference in the coping method adopted by the participants.

Attending Webinars and Training

To capacitate themselves to manage the challenges of remote learning better, educators had to attend various types of online training. Participant 8 shared that this, indeed, was one of the things he had to do: *"continuous learning: I have been attending countless free webinars and training to keep myself abreast of the current situation."* These webinars have greatly helped educators learn new strategies as specific as navigating a particular LMS such as Canvass or as general as learning life skills that can make professors thrive better in these difficult circumstances. Another professor shared

that webinars with topics such as *"how to use effectively and efficiently the LMS of the university and different social media like Google Meet"* were useful in preparing them to ease into teaching remotely. Aside from training in navigating various platforms used for remote learning, the best practices of those who had already experienced teaching in this modality were also shared through these webinars.

Four educators disclosed that they used webinars and training in managing the challenges they encountered while teaching remotely. Two of these participants are classified as junior and the other two are senior faculty. Of these four participants, three teach at private universities and one teaches at a public HEI. This again shows how there was no difference with how the educators attempted to cope with the challenges of the transition. The participants, regardless of age and classification of HEI they work for, have attended several webinars and trainings in preparation, even as the transition to remote modality was ongoing. Through this method, the educators improved their capability of facing the challenges of the transition.

Faculty Support Needed from Higher Educational Institutions

When asked how their institutions extended help to address the challenges they encountered, the participants stated that their HEIs gave free training through webinars, provided a Learning Management System, and allowed them to teach from home. Given this response and after a follow-up question on how they thought the HEIs could further support them during this period, the participants recommended the following: Providing Assistance to Ensure Access to a Stable Internet Connection and Helping Procure Compatible Devices, Granting Access to Educational Resources Online, and Showing Organizational Support for their Over-all Well-being.

Providing Assistance to Ensure Access to a Stable Internet Connection and Helping Procure Compatible Devices

Since online learning was seen as a solution to continuing education amidst the pandemic, Higher Educational Institutions must ensure access to stable internet and guarantee the availability of compatible devices for learners and educators alike. Participant 6 recommended that HEIs should "*ensure [a] stable internet*

connection and equip professors with technological tools". "It could have been far better if faculty would also be supported in terms of hardware and other software support related tools in creating web-based content to be used in online class", said another. Another participant mentioned:

> [HEIs should] provide for free the upgraded teaching devices/tools/gadgets needed by the prof[essors]. (Participant 3)

This recommendation was seen by the participants as a necessary form of support from their HEIs. In a residential setting, almost everything is provided by the academic institutions including but not limited to whiteboards and pens, projectors or LED TVs to cast lessons, and electricity. In this new setting, everything is left to the educator. Professors had to use their own resources, including internet subscription, electricity, and compatible devices such as laptops and tablets. Some of the devices they had were not even suited for the demands of remote learning. The educators wanted the HEIs to recognize this and provide the important tools and basic utilities needed to be able to teach effectively in a home set up. Thus, one participant answered:

> I suggest that instructors be allowed to use the university facilities in our online or distance learning, with internet connectivity and all and no distractions. (Participant 20)

HEIs providing access to a more stable internet connection, and ensuring that educators have available devices to use in this remote modality was suggested by seven participants, two of whom are junior faculty while five are classified as senior faculty. From these seven educators, three teach at a public academic institution while the rest are employed in private universities. Thus, across all sub-groups, the educators uniformly wanted their HEIs to provide support this way. This finding has once again disproved the presumption that educators in private HEIs were supported by their organizations in transitioning through this period better. While private universities usually have better facilities than their public counterparts, these facilities were located and accessible in-campus. The nature of the new modality, on the other hand, requires that the participants continue teaching at home. Professors from private

universities had to pay for these devices and internet connection from their own pockets just like educators from public HEIs did.

Granting Access to Educational Resources Online

Before the shutdown of residential classes, libraries were able to supplement the educators' learning resources. Because of the sudden transition into the remote set-up, library resources became unsuitable for the new modality. Educational resources must *"be made available online to both educators and students,"* suggested Participant 2. This pertains to learning materials such as digital copies of textbooks and journals, among others, being available for browsing or downloading online, thus, ensuring accessibility to both learners and educators alike.

Moreover, Participant 18 suggested *"more exhaustive training"*. This is similar to what Participant 9 recommended when he said that *"extensive training should be provided to [educators] so that we will be prepared when conducting [online] classes."* Training can take the form of tutorial videos uploaded into the university's LMS or webinars hosted by the HEIs on topics that could help equip educators. These include but are not limited to video editing and online teaching effectiveness. HEIs must prioritize this because educators who were effective in teaching residential classes are not automatically effective in teaching remotely. The latter requires a different set of skills, and the professors thought that more training could help address that. Moreover, uploading video tutorials into the HEI's LMS can provide flexibility for educators in that they can access these resources during their free time and at the pace they desire. Another professor remarked:

> [HEIs should] always prepare the educators technically, mentally and spiritually before the start and end of each semester. Online training and webinars is the best way to conduct these. (Participant 19)

Three junior and three senior faulty mentioned granting access to educational resources online as an important form of support academic institutions may provide for their educators. Of these six participants, one teaches at a public HEI, and the remaining five teach at a private academic institution. This finding demonstrates the universality of training in helping educators cope with the

challenges of this transition. This is because educators from all ages and from both public and private HEIs suggested that their academic institutions offer this to their employees. Although there were universities that provided training as the education sector shifted into remote modality, the participants felt that these were insufficient and mostly done swiftly during the start of the semester. Hence, the professors recommended that training be continuous to help remedy the situation. Lastly, if HEIs provide access to educational resources aside from training, this could help the educators in performing their adjunct tasks, particularly their research endeavors.

Showing Organizational Support for the Over-All Health and Well-Being of Educators

Stress arising from dealing with the remote set-up coupled with pandemic anxiety, has levied a huge toll on the welfare of the educators.

"A support system is essential. It almost makes the work half easier," said Participant 22. This may be achieved through *"constant communication [with] and consideration [by] school administrators,"* shared another. Likewise, academic institutions should make their employees feel valued during these times by showing concern for the educators' overall health and well-being. This is important since both the educators' physical and mental fitness are necessary to facilitate learning. A simple check-up on how educators are coping during this stressful period will be greatly beneficial since it will be seen as a gesture of support, and therefore, boost employee morale. One professor suggested:

> I think one way that HAU can better help its employees and faculty is when they address how we are coping as individuals in our own family or community. We are not all equipped the same way and its (sic) also important how the employer would check how we are doing during these times. (Participant 8)

This recommendation for the academic institutions to show support for their educators' overall-health and well-being was noted from four junior faculty participants teaching in private HEIs. Notably, no senior faculty from either public or private HEIs mentioned this in

their narratives. This finding signifies how the younger educators look up to their organizations, through their administrators, for support and motivation. If the HEIs show concern for the well-being of their employees, the participants would feel that their hard work is reciprocated through this show of concern for their welfare.

Conclusion

As was evident from the lived experiences of the participants in this study, the consequential shift into remote learning has transformed the usual delivery of tertiary education in certain higher educational institutions in Angeles and in Clark, Pampanga. While remote learning has long been an alternative to the traditional classroom set-up, the experiences shared in this study have nonetheless reinforced its applicability in different situations especially during the COVID-19 pandemic.

Moreover, the hastened leap towards remote learning has promoted a learner-centered approach compared to the teacher-centric method used before this transition. In a residential or classroom setting, the responsibility to facilitate learning rests mostly on the shoulders of the educators. With the transition into remote modality, teacher dependence through long class discussions was made unfeasible since synchronous classes had been limited. As such, most students had to study asynchronously and were compelled to become responsible for their own learning. The professors, too, had to learn to let go of the reins and trust that their students could learn independently, as long as they provided the necessary learning materials and ensured that these were sufficient and appropriate. What is clear is that with this abrupt shift into remote learning, the responsibility to learn is not equally shared by the educators and their students anymore. Now more than ever, students are required to take a more active role in that responsibility.

It can be noted, however, that facilitating factors in learning, such as ensuring the readiness and motivation of educators to teach in this setup, modifying assessment tools to suit online delivery, and making learning resources available online, among other factors that were shared in this study, were challenging for the educators because of the haste in transition. It can be argued that had there been ample time to prepare for such a shift, coping with these

challenges would have been less difficult for the educators. This is where the support of the HEIs as suggested in this study may come in. By continuing to ensure the readiness of their educators, be it in the form of training to increase their capabilities, guaranteeing their health and wellness to teach, and giving assistance or subsidies to procure devices including utilities needed to facilitate their duties, the challenges brought about by this abrupt shift into remote learning will be mitigated if not eliminated.

References:

Creswell, J. W. (2012). Educational research: Planning, conducting, and evaluating quantitative and qualitative research (4th ed.), Boston, MA: Pearson

Commission on Higher Education (2020). CHED COVID 19 Advisory No. 3 Guidelines for the Prevention, Control and Mitigation of the Spread of Coronavirus Disease 2019 (COVID-19) in Higher Education Institutions (HEIs) https://ched.gov.ph/wp-content/uploads/CHED-COVID-2019-Advisory-No.-3.pdf

Commission on Higher Education. (2017). CHED Memorandum Order No. 17, Series of 2017 Revised Policies, Standards, and Guidelines for Bachelor of Science in Business Administration https://ched.gov.ph/wp-content/uploads/2017/10/CMO-17-s-2017.pdf

Department of Education. (2020a). Dep Ed Order No. 018. Policy Guidelines for the Provision of Learning Resources in the Implementation of the Basic Education Learning Continuity Plan. https://www.deped.gov.ph/wp-content/uploads/2020/08/DO_s2020_018.pdf

Department of Education. (2020b). Official Statement on the Opening of Classes. https://www.deped.gov.ph/2020/08/14/official-statement-on-the-opening-of-classes/

Ebrahimi, A., Ebrahimi, S., & Ashkani Esfahani, S. (2020). How COVID-19 pandemic can lead to promotion of remote medical education and democratization of education?. Journal of advances in medical education & professionalism, 8(3), 144–145. https://doi.org/10.30476/jamp.2020.86090.1217

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. American journal of theoretical and applied statistics, 5(1), 1-4.

Hallere, K., (2020). DepEd, CHED asked to 'initiate academic freeze' until virus mass testing is conducted (Sept. 2020, date last accessed)

Ishak, N., & Abu Bakar, A. (2013). Developing Sampling Frame for Case Study: Challenges and Conditions. http://dx.doi.org/10.5430/wje.v4n3p29

Jager J, Putnick DL, Bornstein MH. II. MORE THAN JUST CONVENIENT: THE SCIENTIFIC MERITS OF HOMOGENEOUS CONVENIENCE SAMPLES. Monogr Soc Res Child Dev. 2017;82(2):13-30. doi:10.1111/mono.12296

Lederman, D. (2020). "How Teaching Changed in the (Forced) Shift to Remote Learning." Digital Learning, Inside Higher Ed. https://www.insidehighered.com/digital-learning/article/2020/04/22/how-professors-changed-their-teaching-springs-shift-remote.

Merriam, S.B (2009). Qualitative research: A guide to design and implementation

Morrow, R., Rodriguez, A., & King, N. (2015). Colaizzi's descriptive phenomenological method. The psychologist, 28(8), 643-644.Novel Coronavirus Pneumonia Emergency Response Epidemiology Team.

Remote Learning, n.d., retrieved from https://trainingindustry.com/glossary/remote-learning/ (14 Nov 2020, date last accessed)

Saunders, B., Sim, J., Kingstone, T., Baker, S., Waterfield, J., Bartlam, B., ... & Jinks, C. (2018). Saturation in qualitative research: exploring its conceptualization and operationalization. Quality & quantity, 52(4), 1893-1907.

Shosha, G.A. (2012). EMPLOYMENT OF COLAIZZI'S STRATEGY IN DESCRIPTIVE PHENOMENOLOGY: A REFLECTION OF A RESEARCHER. European scientific journal, 8.

Synchronous Learning VS Asynchronous Learning in Online Education, n.d., retrieved from https://thebestschools.org/magazine/synchronous-vs-asynchronous-education/ (14 Nov 2020, date last accessed)

Wirihana, L., Welch, A., Williamson, M., Christensen, M., Bakon, S., & Craft, J. (2018). Using Colaizzi's method of data analysis to explore the experiences of nurse academics teaching on satellite campuses. Nurse researcher, 25(4), 30–34. https://doi.org/10.7748/nr.2018.e1516

Appendix A

Participants of the Study

	Range of Age	Higher Educational Institution	Business Courses Facilitated Remotely
Participant 1	31-40	HAU (Holy Angel University)	Business Research, Business Statistics, and Economics
Participant 2	31-40	UPDEPPO (UP Diliman Extension Programs in Pampanga and Olongapo)	Human Resources Management and Strategic Management
Participant 3	61-70	UPDEPPO (UP Diliman Extension Programs in Pampanga and Olongapo)	Accounting and Financial Management
Participant 4	31-40	HAU (Holy Angel University)	Economics
Participant 5	21-30	AUF (Angeles University Foundation)	Tourism Management
Participant 6	31-40	UPDEPPO (UP Diliman Extension Programs in Pampanga and Olongapo)	Economics
Participant 7	50-60	AUF (Angeles University Foundation)	Economics
Partciipant 8	31-40	HAU (Holy Angel University)	Hotel and Restaurant Management
Partciipant 9	21-30	AUF (Angeles University Foundation)	Accounting
Participant 10	31-40	AUF (Angeles University Foundation)	Hotel and Restaurant Management
Participant 11	41-50	UPDEPPO (UP Diliman Extension Programs in Pampanga and Olongapo)	Economics
Partciipant 12	31-40	AUF (Angeles University Foundation)	Accounting
Participant 13	21-30	AUF (Angeles University Foundation)	Marketing Management
Participant 14	21-30	City College of Angeles (CCA)	Business Management
Participant 15	41-50	City College of Angeles (CCA)	Economics, Entrepreneurship, Business Plan, Management Science, Business Law
Partciipant 16	50-60	HAU (Holy Angel University)	Accounting
Participant 17	41-50	HAU (Holy Angel University)	Economics and other Management courses
Participant 18	50-60	HAU (Holy Angel University)	Accounting
Participant 19	31-40	HAU (Holy Angel University)	Taxation, Accounting, Research
Participant 20	50-60	HAU (Holy Angel University)	Accounting
Participant 21	21-30	HAU (Holy Angel University)	Accounting
Participant 22	31-40	HAU (Holy Angel University)	Accounting
Participant 23	21-30	HAU (Holy Angel University)	Accounting and Taxation
Participant 24	50-60	UPDEPPO (UP Diliman Extension Programs in Pampanga and Olongapo)	Business Law
Participant 25	41-50	AUF (Angeles University Foundation)	Hotel and Restaurant Management

Appendix B

Developing Themes on Remote Teaching Challenges Encountered

Sample Response	Coded Description	Theme
"Connectivity is an issue… and this makes teaching quite challenging"	Internet Connection Issues	Issues on Connectivity and Access to Compatible Devices
"…had to upgrade and purchase teaching devices, (and make) use of (these) gadgets to improve screen and voice projection"	Issues on Compatible Devices (gadgets)	
"(We) need to adjust the content of the course to meet the new platform. (We) need to adjust how topics are delivered."	making resources suitable for online delivery	Sudden Transition to Remote Learning Modality
"Keepin interest of the students high.","…the cycle of communication is not completed by any form of feedback then there is no assurance that the instruction or teaching was effective. Add the barriers (noise, choppy lines etc)… on the part of the students that may hinder a seamless conduct of online instruction. "Absence of FTF (face-to-face discussion) eliminates the "profiling" process of (checking whether) the concept is understood or not.	lack of student interest, maintaining student enthusiasm, one way stream of communication, absence of non-verbal cues	One-way Stream of Learning and Maintaining Student Interest
"… this pandemic is taking (a) toll on my holistic health. Home for me is a place where we can	stress taking a toll on educators' physical and mental health, and personal life intermixing	Toll on Overall Well being

Developing Themes on Methods Adopted to Cope with the Challenges Encountered

Sample Response	Coded Description	Theme
"… I try to contextualize the topics with the current situation. I also do my own content for	Uploading Videos of Lessons into the LMS and Sync classes via conferencing	Videos
"Made changes to the required output given the lack to(of) access of(to) resources…, and adjusted measures of assessment"	recalibrating and reducing number of requirements to suit remote delivery	Assessment Tools Adjustments
"I have been attending to countless free webinars and training to keep myself abreast of the current situation"	learn new teaching and coping strategies	Attending Webinars/Trainings

Developing Themes on How the HEIs May Best Support Educators in Coping with the Challenges Encountered

Sample Response	Coded Description	Theme
"Provide for free the upgraded teaching devices/tools/gadgets needed by the profs."	provide the important tools and basic utilities needed for educators to conduct their jobs in a home set up	**Providing Assistance to Ensure Access to a Stable Internet Connection and Helping Procure Compatible Devices**
"provide access to educational resources for educators and students"	access to digital copies of learning resources and other supplemental materials	**Granting Access to Educational Resources Online**
"Prior to start of the semester, extensive trainings be provided to us so that we will be prepared when conducting the classes."	more and continued training to help equip professors transition into remote modality	
"it's also important how the employer would check how we (employees) are doing during these times."	show of concern and gesture of support	**Showing Organizational Support for the Over-All Health & Well-Being of Educators**

Review

The Paradox Is the Message
Agwat- Hilom (NCLA-NCCA, 2020)

By Niles Jordan Breis, M.A.

Much has been said about COVID narratives and other accompanying postulations. The topic, in fact, is a tiresome one, if not almost a trite concern for many since there has been a surge of anthologies, books, and other similar discourses or encounters solely on the pandemic. It should be noted, for instance, that in UP Diliman alone, more than five literary journals were devoted to COVID-related experiences and launched online while UP Manila/UP-PGH had its own as initiated by some writer-doctors. Even the Cultural Center of the Philippines opted to dedicate one of the *Ani* volumes to the lockdown tropes.

What makes *Agwat-Hilom* a cut above the rest?

For one, the list of contributors is highly selective, with the writers well-recommended by the regional coordinators who are literary artists themselves. The latter are familiar with the areas as designated and have kept themselves abreast with some of the best writers of the regions. Furthermore, the book is significantly inclusive, encompassing different genres and amplified by the use of diverse languages and their corresponding translations. As to trope range, the inclinations are as open as the universality of the topic at hand, and each work attempts to go beyond topicality. The real challenge, strictly, is in how a particular fiction could transcend, for example, the mere here-and-now of all pandemic-related tangibles relative to proximate lockdown restrictions. In many pieces included here, such transcendence may point to an admission of something powerful though not necessarily within the power of introspection or the fluency of silent reflection.

The primacy of paradox within the anthology and all the attendant stirrings present in the featured works seem to be a given and in entirety, there is a more pronounced persistence to emphasize the value of literary creation amid the pandemic. In the prefatory of Prof. Rolando Tolentino, such creation would always be essential and, in addition, he emphasized that writers must have clear assertions even against the false claims of the State surrounding COVID narratives. There is no dearth of pandemic materials, after all, and the anthology came out with 40 works in four genres, covering the clusters from NCR, Luzon, Visayas, and Mindanao. All told, the pervading ruminative stream in almost all works, notably in essays and short stories, is the propensity towards the open-endedness of uncertainty as a notion. Yet still, such a condition bounces back on the gradient of the apparent despair-hope interlock as expressed in the Foreword of the NCCA Chair Nick Lizaso: "To unbind ourselves and to heal our souls."

The paradox of *Agwat-Hilom* as distancing-healing also goes beyond the sheer binary of things. It is the prevailing message, and it tends to be back at the core, seeing the person more inwardly as if to focus on the fact that distance refers not only to others but to the self as well. It is no wonder that for some writers, a pandemic-centered work, long or short, appears largely cathartic, if not a plain consolation. But then again, real or imagined, most of the stories here are traversals and chronicles on/of dread in a certainly dangerous time to survive. In the book's Introduction, NCLA Head Julieta Mallari does another echoing of optimism, however:

> Finally, *Agwat-Hilom* is like a frame put around a particular scene in 2020: a spectacle of surreal colors of pain and ominous shadows of suffering when viewed closely. And "without distance, this closeness cannot cure." However, through the lens of literature, particularly with the calm reassurance of words that restore courage and hope, distance may be created, and the scene can have a dramatic transformation: healing is communicated afresh.

Rebyu

Ang *Balager* at ang *Maqueda* sa Mga Alimpuyo ng Isla

Ni Niles Jordan Breis, M.A.

Kilala ang *island-province* ng Catanduanes bilang *Land of the Howling Winds* o pook ng maaalimpuyong hangin. Nakatatakot ang pagsipol, nangangalit at iwinasiwas ang mga nakahambalang lalo't kung may *super typhoon.*

Catanduanes mismo ang nasa sentro ng dalawang aklat ng kapwa Bicolanong sina Emman Barrameda at Nap Arcilla, at ang mga akda ay pareho ring nilimbag at inilunsad ng *Balangay Productions* nitong Setyembre 12, 2020.

Isang kalipunan ng mga personal na sanaysay ang *Balager* at bagama't hindi lamang ang Catanduanes ang lokasyon dito na binabanggit ng awtor, masasabing ang kabuuan ng aklat ay nakaugat pa rin sa naturang isla. Ang salitang *balager* ay patungkol sa salitang Bikol na *balag-balag* o sa wikang Filipino, ito ay nangangahulugan din ng "paglalagalag".

Mas tahimik na mga alimpuyo ang matatagpuan sa *Balager*, mga alimpuyo ng sarili at para sa mga mahal sa buhay at iba pa, sa salimuot ng mga relasyon o kawalan nito, sa mga desisyong pinanindigan o tila binalewala lamang, sa mga pilit kinalimutan o binabalik-balikan. Sa akdang ito, Si Barrameda mismo ang naglalagalag—palaboy tila sa umpisa at nakatuon noon sa ilang mababababaw na bagay hangga't ang paglalagalag ay humantong sa isang paglalakbay na may mga nais tiyakin, nais linawin kahit pa nga di naman lahat mauuwi sa inaasahang kaayusan o kaligayahan. Halata ngang mas matining at timpi ang boses ng awtor sa halos lahat ng sanaysay na kabilang dito, higit sa mga piling eksena na parang mga tagpo sa isang pelikulang mas simboliko ang mga imahen sa halip na mga hayagang paglalarawan. Lutang ang pagiging mananalaysay dito ng awtor na minsan na ring ginawaran ng *National Book Award* para sa kanyang aklat ng maiikling kuwento, ang *P'wera Bisita*.

Samantala, may kakaibang pagpupuyos naman ang *Maqueda* ni Napoleon Arcilla o Nap Arcilla at walang duda na ang aklat na ito ay sandosenang kuwento na may kalaputan kung baga. Tumutugma ito sa minsang nabanggit ng awtor na ang mismong kalipunan ay hindi isang romantikong pananaw-mundo ukol sa buhay-dagat sa isla ng Catanduanes at lahat ng kaugnay pang paksa. Aniya, kung mayroong isang salita na magsisilbing buod, ito raw ay "nasa" o pagnanasa dahil nga ang bawat kuwento ay may malalim na pag-aasam kung kaya't mga alimpuyo ng marurubdob na salaysay ng mga tunggaliang pisikal o lampas-katawan ang itinatampok dito. At tila walang pakundangan si Arcilla sa wika at mga limitasyong malimit na idinidikta ng lugar o mga nakasanayang asal. Para sa may-akda, personal na paborito niya ang "Baraka" dahil sa emosyonal na dahilan at "Ang Lalaking Nakipagtalik sa Taraungan" para naman sa pagiging sekswal. Gustuhin, kung tutuusin, ng marami ang huli dahil sa magkahalong bulgar at may empatiyang anggulo, sabihin pang may mga nagugulat sa mararahas na detalye umano ng awtor.

Si Arcilla ay nagsimula bilang *fellow* sa *Saringsing Writers' Workshop* sa Buhi, Camarines Sur para sa Bikol bago pa siya natanggap sa mga pambansang palihan at kinalaunan ay nagwagi sa mga timpalak-pampanitikan sa Bikol man o Filipino at sa mga kategoryang tulad ng tula, kuwento at dagli. Pareho sila ni Barrameda na matatas sa Bikol at Filipino at kapwa rin sila kabilang sa *Bilog Writers' Circle*, isang aktibong grupo ng mga manunulat sa Catanduanes. Si Barrameda na nanalo rin noon ng *Kabulig Writers' Prize* sa Bikol ay nagsisimula na ring magsulat ng nobela.

Ang *Balage*r at ang *Maqueda* ay dalawa lamang sa maituturing na mga natatanging akda sa Filipino para sa 2020. At hindi mahirap itong paniwalaan matapos mabasa ang mga nasabing aklat.

BIONOTES

Dr. Resil B. Mojares is Professor Emeritus at the University of San Carlos, Cebu City, where he was founding director of the Cebuano Studies Center (1975-2000). He served as Visiting Professor in universities in the United States, Japan, Singapore, and the Philippines, and has authored, co-authored, or edited more than twenty-five books and published numerous articles in books and journals in the Philippines and abroad. Among his books are *Origins and Rise of the Filipino Novel* (1983), *House of Memory* (1997), *Waiting for Mariang Makiling* (2002), *Brains of the Nation* (2006), *Isabelo's Archive* (2013), and *Interrogations in Philippine Cultural History* (2017). For his writings and scholarship on diverse aspects of Philippine culture and history, he has been awarded national and international honors. In 2018, he was conferred the title of National Artist in Literature.

Dr. Florencia Charito I. Sebastian is an associate professor of Economics and Social Sciences at the University of the Philippines Diliman Extension Program in Pampanga (UPDEPP). As an academic with inter-disciplinary interests, she looks through the lenses of economics of culture in studying subject matters like area and regional development, Indigenous People and development, and sustainable environmental management. She served as director of UPDEPP and as executive director of the bicameral bodies Congressional Oversight Committee on Agricultural and Fisheries Modernization (COCAFM) and Congressional Commission on Agricultural and Fisheries Modernization (AGRICOM) through which she became an advocate of the effective and efficient nexus between food and non-food production and management of ecosystems. She was also one of the chiefs of technical services in the assessment of Philippine education and training system in the early 1990s conducted by the Congressional Commission on Education (EDCOM 1).

Dr. Imogene Evidente is an associate professor at the University of Philippines Diliman, where she earned her B.S., M.S., and Ph.D. in Mathematics. She specializes in mathematical crystallography and color symmetry. She also worked in the IT industry as a business analyst and project manager, and is currently pursuing her M.S. in Statistics, also at the University of the Philippines Diliman. However, she considers herself primarily a teacher, dedicated to imparting the love of learning

to her students. Few things give her more joy than when her students are able to not only understand complex math concepts but are also able to find beauty in math and appreciate it for its own sake.

Angela D. Carreon is a B.S. Chemical Engineering graduate from the University of the Philippines Diliman. She finished her Master of Arts in Mathematics Education also from UP Diliman and her Graduate Diploma in Mathematics Teaching from the UP Open University. Prior to her return to the academe, she worked in the manufacturing industry as a Production Department Manager. Currently, she is an assistant professor and the Deputy Director of the University of the Philippines Diliman Extension Programs in Pampanga and Olongapo. Her research interests include the psychology of learning Mathematics and innovative methods of teaching Mathematics.

Dr. Purisima P. Panlilio earned her Master of Management and Ph.D. in Educational Administration degrees from the University of the Philippines Diliman. As a Certified Public Accountant, she practiced her profession working as external auditor for business and nonprofit organizations. She also served in an administrative capacity and as financial consultant to three schools, being appointed as a school director in one of them. Dr. Panlilio is an assistant professor of Accounting, Management Control, and Financial Management in both the undergraduate and graduate programs of the University of the Philippines Diliman Extension Programs in Pampanga and Olongapo.

Maria Eunice Felix is an assistant professor of the Faculty of Business Management at the University of the Philippines Diliman Extension Programs in Pampanga and Olongapo. Her decade-long career as a business educator centers on the areas of management, marketing, and entrepreneurship. Aside from freelance consulting for small enterprises and start-ups, Eunice also advocates for community development during her free time.

Niles Jordan Breis is an award-winning poet, essayist and novelist. A four-time Palanca awardee, he was declared the 2018 Grand Winner of Valledor Prize for Best Novel.

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