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The Alphabet of Scaling G2: Perspectives of Local Mountaineers on Perceived Risks, Tourist Satisfaction and Experience at Mount Guiting-Guiting in Sibuyan Island

Turner Evon F. de Torres[1] and Geronio G. Ulayao[2]

ABSTRACT

Recognizing the limitations identified by the UNWTO in quantifying domestic mountain tourism due to a lack of information on travel motivations, this qualitative study aims to delve deeper into the reasons and experiences that lead local mountaineers to repeatedly visit a specific location. Unlike the assessment of international mountain tourism, a different approach is needed domestically. The findings of this research will provide valuable insights into the dynamics of domestic mountain tourism and offer practical guidance for enhancing the professionalism of Sibuyan Island's tourism industry. By examining the target market segment, this study also seeks to inform the development of tourism products that effectively cater to consumer demand and visitor expectations. Moreover, the study contributes information and data that support informed decisions for long-term planning and evaluation processes. It lays the groundwork for formulating goals, identifying KPIs, and establishing baseline measurements for its competitive advantages. By concentrating on the lived experiences of local tourists, this research also offers valuable insights for improving infrastructure and service provisions. The data obtained can be applied to the development of projects concerning lodging, transportation, and other crucial tourism-related amenities. An inductive methodology was employed for the thematic analysis of the data, involving a data-driven exploration where the dataset initiated the process of understanding meaning. Through the study, complex interplays of factors that influence mountaineers' decisions to revisit Mount Guiting-Guiting were explored while underscoring the significance of addressing perceived risks, enhancing tourist satisfaction, and continually improving the overall climbing experience to promote sustainability and safety while preserving the natural beauty of the mountain.

Keywords: *adventure tourism, Sibuyan Island, Mount Guiting-Guiting, community-based tourism, nature-based tourism*

INTRODUCTION

Mountains have traditionally drawn tourists, especially when catering to domestic and local markets with existing mountaineering or rock-climbing communities. However, surprisingly, tourism development plans often lack a clear understanding of tourists' perspectives on mountaineering.

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As defined by the United Nations World Tourism Organization (UNWTO), Mountain Tourism is "a type of tourism activity which takes place in a defined and limited geographical space such as hills or mountains with distinctive characteristics and attributes that are inherent to a specific landscape, topography, climate, biodiversity (flora and fauna) and local community. It encompasses a broad range of outdoor leisure and sports activities". When based on a domestic and local source market with an established climbing or skiing culture, mountaineering has long provided for appealing tourist destinations (Dewan & Kim, 2020).

Several countries with high elevations (some of which are landlocked) can be considered 'pure mountain tourism destinations', as mountains are the main driver or attraction for tourism demand. Countries like Nepal,

Andorra, and Austria are examples of this. As described by the Nepal Promotions Board in 2022, Nepal stands as a prominent global hub for trekking, heralded as the birthplace of commercial trekking in the early 1960s under the leadership of Colonel Jimmy Roberts, who organized the inaugural commercial trek. Boasting an ensemble of eight of the tallest peaks on the planet, Nepal is revered as a sanctuary for mountaineers.

Covering a modest expanse of 468 square kilometers, with mountains and forests comprising 92% of its land, Andorra presents itself as a haven for nature enthusiasts with its easily accessible and abundant natural offerings. The allure of nature serves as the primary draw for visitors, with 'nature' emerging as the predominant motivator for travel to the region. Govern d'Andorra reported that in 2022, the destination warmly received 8.4 million international visitors, including 3 million overnight guests. Noteworthy attractions include 303 kilometers of ski slopes, protected natural reserves, and the esteemed Biosphere Reserve located in Ordino.

Austria, enveloped by the Alps, which blanket two-thirds of its terrain, features an array of villages and cities that double as premier mountain tourism locales, offering a diverse array of mountain-oriented products and services year-round. The Federal Ministry of the Republic of Austria detailed in 2023 that a significant portion of Austria's tourism activity, quantitatively speaking, is concentrated within federal provinces nestled in the Alpine region, with Tyrol accounting for 33% and Salzburg for 20% of overnight stays based on 2019 data.

As reported by the Food and Agriculture Organization of the United Nations in July 2023, the key drivers behind the growth of mountain tourism are financial gain, opportunity for local people, and the creation of sustainable products. Other reasons include preserving natural and cultural assets, distributing tourist flows, enhancing the current tourism product, and addressing seasonality. On the other hand, guaranteeing adequate infrastructure and sustainability, followed by product development, connectivity, and public-private-community cooperation, are the primary challenges for developing and promoting mountain tourism. Other difficulties include backing from policymakers, carrying capacity, safety and security measures, or locals' acceptance of tourists.

UNWTO data from 2023 indicates that domestic tourism is six times larger than international tourism. Globally, an estimated 9 billion domestic overnight trips occurred in 2018, with over half in Asia and the Pacific. In the Philippines, the Department of Tourism (DOT) and Philippine Statistics Authority (PSA) report from June 29, 2022, revealed a significant 38.16% increase in domestic tourism trips in 2021, reaching 37,279,282, compared to 26,982,233 in 2020, as detailed in the 2021 Philippine Tourism Satellite Accounts (PTSA).

In 2023, Davao del Sur saw 1.5 million domestic tourist arrivals, with day tours being a significant contributor. Digos City accounted for the largest share due to the popularity of the Mt. Apo loop, according to Davao del Sur Tourism and Cultural Office head Kervin Joseph Elijay, who emphasized the importance of local tourism to the province. Additionally, the province received 27,932 foreign tourists in 2023, bringing the total arrivals to 1,527,932

Although the Province of Romblon offers a wide range of tourism attractions that are influenced by its natural and cultural heritage, they are not properly appreciated. Romblon is highly recognized for its adventure, ecology, wildlife, and marine tourism, particularly on Sibuyan Island.

However, Sibuyan, Romblon, has not yet developed its capacity for ecotourism (Federico, 2018). Furthermore, the Province lacks both robust tourism policies and effective monitoring systems. When we zoom in on the Island of Sibuyan, we can see that there is still room to grow its mountain tourism industry. Sibuyan Island is the home of the 11th most prominent mountain in the Philippines, Mount Guiting-Guiting. Its popularity amongst mountaineers is such that it is one of the toughest mountains in the country, which has the potential to harness the power of tourism.

Literature Review

The most significant and quickly expanding economic activity on the planet is tourism. It is a multifaceted, multicultural activity that significantly contributes to a nation's economic growth by fostering job opportunities and advancing the services industry (Dewan & Kim, 2020). Mountains have drawn tourists like a magnet, and they're one of the tourism industry's fastest-growing divisions overall (Goeldner & Ritchie, 2006; Schneider, 2010). Mountain tourism represents a significant portion of the global tourism market, contributing 15–20% or US$ 70–90 billion annually. Its appeal lies in the exhilaration and adventure offered by the inherent risks of mountaineering activities. Growing tourist demand for mountain hiking, trekking, and rock climbing has been fueled by their limitless needs and desires. While numerous studies have examined the demand side of mountain tourism—exploring motivations, expenditures, and current patterns—less research has focused on how tourists perceive the factors influencing their mountain selection and whether these perceptions impact their likelihood of returning.

Rama et al. (2019) conducted a bibliometric analysis of the indexed scientific production on "mountain tourism" in the international databases Scopus and Web of Science. This research aimed to assess the existing body of knowledge in mountain tourism and pinpoint key research areas, emerging trends, and existing gaps. The analysis encompassed 134

publications identified through a search using the term "Mountain Tourism."

The findings indicated that Scopus offers more comprehensive coverage of scientific output in this field, with limited output, with only 19 individuals contributing between two and three publications.

Europe emerged as the most active continent in mountain tourism research. The study underscores the necessity for further investigation into areas such as the social and cultural effects of mountain tourism, the influence of technology, and the consequences of climate change. Additional search results provided supplementary insights into the bibliometric analysis of mountain tourism literature within Scopus, research on economic development and mountain tourism between 2010 and 2020, and studies on tourism sustainability.

The study of Dewan & Kim (2020) analyzed the impact of the attributes of tourism service quality (TSQ) on tourists' behavioral intention to engage in mountaineering in Pakistan. The study focused on the impact of monetary advantages, convenience advantages, and safety and security on tourists' intentions. The moderating role of the destination's image in creating the tourists' intentions was also analyzed. The research model, validated through exploratory factor analysis and Cronbach's alpha, revealed that international tourists' intention to visit Pakistan was primarily driven by monetary and convenience advantages. Interestingly, personal safety and security did not significantly influence their attitude, as tourists who focused on mountaineering tended to accept inherent risks. However, the destination's mountaineering image did positively impact their intentions for future visits to Pakistan. Related research explores factors influencing tourist satisfaction and loyalty regarding local foods, the mediating role of destination image in risk and constraint perception, and cross-cultural perceptions of service quality in Pakistan.

Mountain Tourism around the World

A 2021 study, jointly developed by the Food and Agriculture Organization of the United Nations (FAO), the Mountain Partnership Secretariat, and UNWTO, found that in mountainous areas, variations in temperature, humidity, heat, and daylight hours are associated with shifts in latitude and altitude. These factors impact ecosystems, human communities, and subsequently, the appeal of tourism destinations. Therefore, mountain ranges worldwide offer possibilities for a wide variety of tourism activities, of which some are more developed than others:

Winter and Sports Tourism. Primarily confined to higher mountain regions and snow seasons, typical activities include cross-country, alpine, and glacier skiing, heli-skiing, snowboarding, sledding, snowshoeing, and tobogganing.

Walking Tourism. This enables visitors to engage with mountain landscapes, wildlife, and local culture. Well-planned development can provide diverse economic and social benefits for residents and communities, especially as a summer income source in areas reliant on winter activities. With rising consumer interest in authentic experiences and the increasing popularity of active tourism, walking tourism, as highlighted by UNWTO, offers a strong potential to showcase a destination's complete offering, including its culture and nature.

Adventure and Sports Activities. These activities, available in mountain areas both during and outside snow seasons (weather and access permitting), include mountain biking, zip-lining, quad biking, horse-riding, rock climbing, ice climbing, paragliding, zorbing, and caving. They also encompass freshwater adventure and sports like river and lake tours, canoeing, sailing, windsurfing, paddle-surfing, kite surfing, kayaking, rafting, and freshwater fishing.

Classifications of Mountains

The United Nations Environment Programme World Conservation Monitoring Centre's (UNEP-WCMC) mountain classification system served as the foundation for a global framework aimed at creating comparable statistics worldwide. Using this system, Mount Guiting-Guiting on Sibuyan Island is categorized as Class 3. The classification defines seven types of mountains considering mountain altitude, local elevation range, and slope:

Class 1: elevation > 4,500m

Class 2: elevation 3,500 – 4,500m

Class 3: elevation 2,500 – 3,500m

Class 4: elevation 1,500 – 2,500m and slope ≥ 2°

Class 5: elevation 1,000 – 1,500m and slope ≥ 5°or local elevation range [7km radius] > 300m

Class 6: elevation 300 – 1,000m and local elevation range [7km radius] > 300m

Class 7: isolated inner basins and plateaus less than 25km2 in extent that are surrounded by mountains but do not themselves meet criteria of classes 1–6.

Mountaineering in the Philippines

Geotourism, a growing sector emphasizing a destination's natural and cultural heritage, sees active volcanoes as major attractions, drawing millions annually. A 2019 study by Aquino et al. explored visitor motivations for touring Mount Pinatubo in the Philippines. Their research identified push motives (escape/relaxation, novelty-seeking, volcano knowledge, socialization) and pull motives (disaster/cultural heritage, volcanic/geological attributes). The study, based on 174 surveys, found novelty-seeking to be the strongest motivator. Domestic

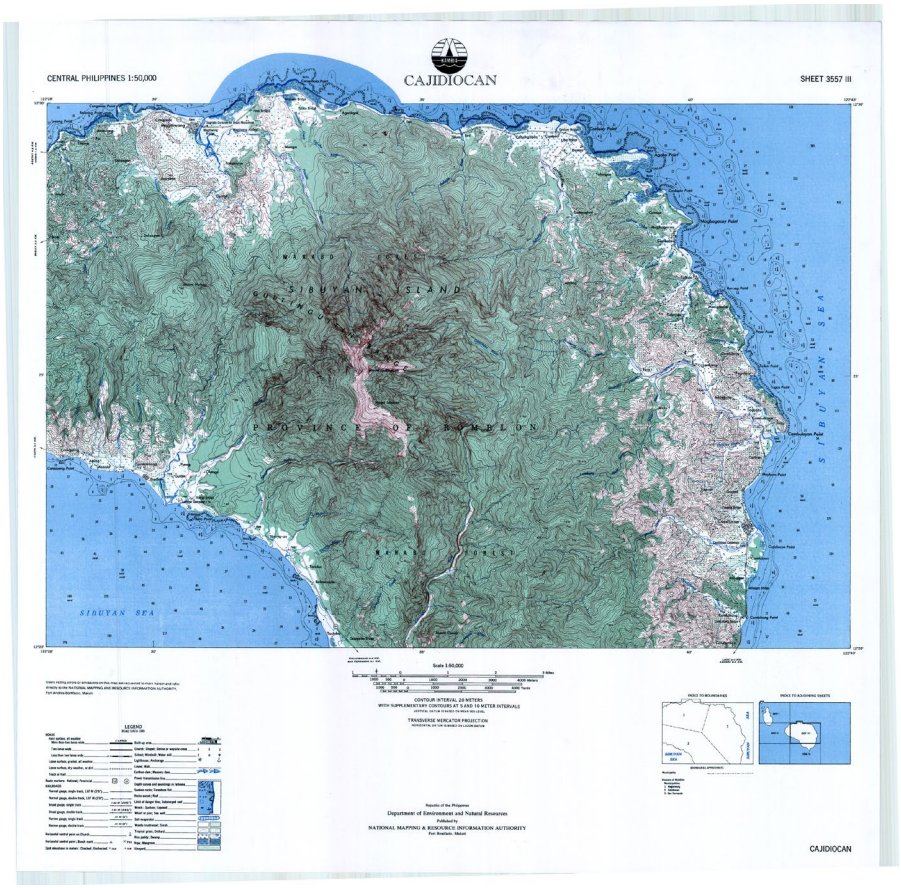

Figure 1. Topographical Map of Sibuyan Island focused on the elevation of G2 published by the National Mapping and Resource Information Authority in 2010

visitors showed stronger escape/relaxation and socialization motives than international visitors.

Geotourism, a growing sector emphasizing natural and cultural heritage, sees active volcanoes as major attractions, drawing millions annually. A 2023 study in the Philippines (Groves) explored visitor motivations for touring Mount Pinatubo. The research identified push motives (escape/relaxation, novelty-seeking, volcano knowledge, socialization) and pull motives (disaster/cultural heritage, volcanic/geological attributes), while also examining the influence of demographics and prior experience, and comparing domestic and international visitors.

The strongest driver for visiting volcanic sites was novelty-seeking. Domestic tourists were more motivated by escape, relaxation, and socialization compared to international visitors. These findings offer insights for developing and marketing volcano geotourism and diversifying Philippine tourism. The study underscores the importance of understanding visitor motivations at geotourism destinations for effective marketing and planning, contributing to the limited research on geotourism at volcanic sites.

Gian and Shiela (2016) wrote an article about their experience climbing Mt. Guiting-Guiting in the Philippines. The article describes the spiritual experience of climbing mountains and the lessons learned during the climb. The climbers woke up at 1 AM and started climbing towards the summit. After two hours of climbing, they rested at the Crash Site, where an aircraft had crashed years ago. The climbers paid their respects to the people who lost their lives in the crash before continuing their climb. The article highlights the importance of respecting the history and culture of the places visited during travel.

The article also provides information on the technical difficulty of climbing Mt. Guiting-Guiting and the natural phenomena found at the ridges and slopes of the mountain. Other search results provide additional information on the location, trails, and landmarks of Mt. Guiting-Guiting, as well as personal accounts of climbing the mountain.

Asia's Galapagos

With a land area of around 45,600, Sibuyan Island (Figure 1) is the second largest island in the province of Romblon. The island is surrounded by the islands of

Tablas, Masbate, Panay, and Marinduque. The region's terrain is dominated by sloping areas. It is estimated that 77% of the land has a slope of 18% or more. Mount Guiting-guiting, which rises 2,058 meters above sea level, is the island's highest point. According to Corona's classification, Sibuyan Island has a Type III climate, meaning that there isn't a particularly noticeable maximum rainy season there and that the island typically experiences a short dry season that lasts between March and May or December and February (DENR- MIMAROPA, 2014).

There are 3 municipalities and 36 barangays with an annual growth rate of 0.96%. Currently, the population of Sibuyan is 57,248, and the population density is 118.2/km2 (NSO, 2010). The indigenous dwellers in Sibuyan Island are called Sibuyan Mangyan Tagabukid (SMT). Two Certificate Ancestral Domain Titles (CADTs) were issued to SMT covering a total of 8,408.84 has located in two non-contiguous areas within Cajidiocan and San Fernando (Tongson & McShane, 2006).

The island is acknowledged as a major hub for biodiversity. Due to the island's complex geological history, extended periods of isolation from other islands, and diversity, it was thought that many groups of plants and animals exhibit medium to high levels of endemism (Brown et. al., 2013). Aside from that, this island still has a high remaining forest cover. Due to its ecological importance, Sibuyan Island's most prominent peak, Mt. Guiting-guiting, has been declared a Natural Park by Pres. Fidel V. Ramos under Proclamation No. 746 on February 20, 1996. The terrestrial reserve with an area of 15,260.48 hectares was mandated to be protected and conserved on a sustainable basis (DENR- MIMAROPA, 2014). In spite of its protected status, Mt. Guiting-guiting Natural Park (MGGNP) and many other natural areas on the island remain under serious threats.

Lorenz Pasion, in a February 4, 2023, Rappler.com article, attributed Sibuyan Island's "Galapagos of Asia" moniker to its exceptionally rich biodiversity and endemism. BirdLife International's (BLI) website further notes that the forests of Mt. Guiting-Guiting National Park on Sibuyan are home to several threatened and restricted-range bird species. Three bird subspecies are endemic to the island: the Philippine Hanging Parrot (Loriculus philippensis), locally known as colasisi; the Philippine Pygmy-woodpecker (Dendrocopos maculatus); and the Orange-bellied Flowerpecker (Dicaeum trigonostigma sibuyanicum).

Sibuyan is also home to an estimated 700 vascular plant species, 54 of which are endemic. Among its five threatened endemic mammal species is the critically endangered Philippine Tube-nosed Fruit Bat (Nyctimene rabori).

BirdLife International (BLI) attributes Sibuyan's exceptionally high endemism of flora and fauna to its isolation since the middle to late Pleistocene period, as stated on their website. The Foundation for the Philippine Environment's website further highlights Sibuyan Island's biodiversity by noting that it is home to the following:

- 700 vascular plant species
- 144 species of trees, of which 33 are endemic to the Philippines, two are endemic to Sibuyan, and 10 are on the International Union for the Conservation of Nature (IUCN) Red List List of Threatened Species
- 54 plant species are endemic to the island
- 83 fauna species endemic to the Philippines, of which four are endemic to Sibuyan and 18 are on IUCN's Red List
- 130 bird species
- 9 native terrestrial mammal species
- 9 bat species
- 16 reptiles

The biodiversity of Sibuyan Island remains a source of scientific discovery, with researchers documenting 14 new species of amphibians and reptiles in Mt. Guiting-Guiting as recently as 2021. This was reported in an article by the University of the Philippines Los Baños (UPLB), where Camila Meneses, a former UPLB Museum of Natural History extension associate and current PhD student at the University of Kansas, noted the island's continued potential, writing, "There is still a lot to discover in Sibuyan Island.".

Sibuyan, a 466-square-kilometer island in Romblon province, according to PhilAtlas, is divided into three coastal municipalities: Cajidiocan, Magdiwang, and San FernandoThe. The Philippine Statistics Authority records a combined household population of 62,745 for these three municipalities. Environmental group Seacology said on its website that Sibuyan Island's forest is believed to be "one of the densest forests in the world," with an estimated 1,551 trees per hectare.

METHODOLOGY

This study employed a thematic qualitative which enabled the researchers to analyze relationships, patterns, and trends with a high level of accuracy with respect to the perceptions of local mountaineers to Mount Guiting-Guiting in Sibuyan Island. The researcher used purposive sampling techniques, specifically homogeneous sampling, and set the criteria for choosing the respondents. This is a type of non-random sampling technique wherein subjects are selected by the researcher based on their characteristics. Generally, a sample size of 30 respondents is sufficient; however, the researcher selected 37 individuals from the data provided by the Mount Guiting-Guiting Natural Park (MGGNP) – Protected Area Management Office who are amenable to an interview.

The study also employed an unstructured or open-ended interview via ZOOM. The purpose of this kind of interview, which frequently takes the shape of a conversation, is for the researcher to learn more about the participant's opinions, thoughts, attitudes, and beliefs regarding particular events or phenomena. An unstructured or open-ended interview typically comprises of several interviews spaced out over time. The primary emphasis lies in the participants' subjective interpretations of the event or phenomena under investigation (Maree, 2020).

FINDINGS AND DISCUSSION

5As of Encountered Risks

Atmospheric Conditions, Architectural Features of G2, Ailment-related Issues, Access to Essentials, and Amateur Hikers are the codes used to discuss the result for the interview question: "Can you provide examples of risks you encountered during your climb/s?". One of the risks of climbing is the extreme weather conditions caused by the high altitude of the mountains. Cold weather can cause hypothermia and may pose health-related issues to climbers. Along with this, torrential rains and strong winds brought forth by bad and unpredictable weather can also cause harm. In relation to this, injuries during a hike, such as fatigue and altitude sickness, are but some of the risks encountered during climbs.

The unlimited ravines, rock climbing partnered with unstable rocks, jagged rock formations, and steep trails are architectural features of G2 that are deemed to be risky. Although this may add to the uniqueness of the climb, one should not eliminate this as a risk. Access to essentials and amateur hikers are also noted to be risks encountered. Scarce water and food supply are also observed to be risky. Finally, in the event that some mountain climbers in the group are untrained and unfit to climb, the whole group can be placed in a dangerous position.

8Bs of Climbing Satisfaction and Tourist Experience

The evaluation of a mountaineer's overall satisfaction with the previous climb of G2 varies based on the specific aspects that contribute to their satisfaction. The satisfaction brought by the scenery and views is one. However, the human input should not be overlooked, for the guides and porters are able to add a sense of safety and comfort to mountaineers. A breakthrough moment or a feeling of accomplishment, knowing that a climber was able to conquer one of the hardest climbs in the country, adds to this; climbers who are well-integrated with nature throughout the hike feel a certain feeling of bliss that is incomparable to most. Additionally, living in a temperate climate, the change of feeling in terms of the weather or temperature enhances the tourist experience. Breathtaking Scenery, Blazers of Trail, Breakthrough Moment, Balmy Weather, Blissful Experience, Bonding of Climbers, Beginner's Hike, and Bad Feedback are the overarching themes under this subcategory.

3Cs of Climbers' Perceived Risks

When asked about the importance of the level of perceived risk when deciding to climb G2, the responses of the interviewees were categorized into: 1. Careful Decision; 2. Crucial Reason; and 3. Climber's Well-Being.

A respondent was able to point out that the 9/9 difficulty rating of G2 should not be underestimated. This is in accordance with another respondent who mentioned that it is of utmost importance because it allows mountaineers to remain level-headed and not too arrogant while traversing the trail. We categorized this as a careful decision, as the emerging theme focuses on ensuring that the sense of objectives prior to the climb was set. In addition, Crucial Reason is also prevalent in the responses of the interviewees as the perceived risk, per respondents, is a matter of life and death. Lastly, the Climbers' Well-Being is also at play here as the perceived risks necessitate careful consideration of one's climbing skills, physical preparedness, and ability to handle potential challenges along the way.

5Ds of Ancillary Factors and Tourist Satisfaction

Down-the-line Suggestions, Delighted Experience, Dependable Tour Guides, Dismayed Climbers, and Domestic Bliss, are the codes utilized to categorized the theme that emerged through the guide question: "How do you think the quality of the trail, facilities, and support from the local community impact your tourist satisfaction?" While respondents were able to point out their satisfaction towards ancillary factors of their trip, suggestions were also raised pertinent to maintaining the natural beauty of the site. With this in mind, suggestions for facilities with a low environmental impact, such as hanging bridges to aid river crossings, were also mentioned.

It is interesting to point out as well that the tour guides were able to make a positive mark on the climber's experience, citing their professional know-how of the trail, which entails the safety of the group. Along with this, the local reception towards the climbers also added delight to their overall experience. The limitations imposed by an unstable internet connection and limited ATMs were also factors to be considered.

6Es of Climbers' Perceived Difficulty when Climbing G2

The Escalation of Trails includes factors like altitude, length of the climb, elevation gain, and exposure to harsh weather conditions, which play a

significant role in the climber's physical performance during the ascent. The difficulty of G2 influences a climber's decision as it is a matter of readiness as much as a matter of life and death. With this in mind, an Elated Feeling, knowing that it was one of the Philippines' hardest climbs, but still being able to reach the summit, is an accomplishment enough for some to make the trip to Sibuyan Island. The Eureka Moments, which include the satisfaction after a hard climb and an overall life-changing experience as described by one of the climbers, are a factor that positively influences a climber's revisit intention.

To a trained hiker and an experienced mountaineer, however, G2 posits itself as an average climb. Some of which are not in agreement with the 9/9 difficulty rating of the mountain. This is in total contrast to the responses categorized under the Encountering a Hurdle code. As some climbers were able to acquire bruises, and are in complete agreement with the mountain's reputation as one of the toughest Philippine mountains. Lastly, it is integral to point out that, still, the intentions of mountaineers were positively affected by the experience they had with the local mountain guides.

4Fs of Choosing Other Destinations aside from G2

When asked: "Have you ever considered other mountaineering destinations instead of revisiting Mount Guiting-Guiting? What factors led you to choose another destination?", Finding New Experience, Framing Comparisons, Fortified with Satisfaction, and Fulfillment of Hiking were the codes used to categorized the theme. Citing that a different mountain equates to a different experience, some mountaineers would rather visit another mountain. Along with this, hikes that test a climber's limit draw them to consider other mountains that are harder than G2 to scale. In line with this, whether G2 is truly one of the toughest or not, one can only do so if they have comparisons to consider. As the Philippines is a treasure trove for adventure travelers, alternatives to G2 are not limited.

8Gs of Climbers' Suggestions for Improving G2 Experience

The 8G's of Climbers' Suggestions for Improving G2 Experience encapsulate a diverse range of insights and recommendations gathered from local mountaineers regarding their experiences at Mount Guiting-Guiting. The thematic analysis of the interviews highlights the multifaceted nature of factors that contribute to a fulfilling and safe climbing experience, including environmental conservation, community collaboration, safety protocols, and enhancing overall satisfaction. By synthesizing the responses into these eight categories, it becomes evident that there is a shared vision among climbers for creating a more sustainable, enjoyable, and well-rounded experience on the mountain.

The results of the interview underscore the importance of holistic approaches to mountain climbing that go beyond the physical act of ascent. Suggestions such as "Grasping the fundamentals of hiking" and "Groups for guides and porters" emphasize the significance of education, preparation, and teamwork in ensuring a successful and enriching climb. Furthermore, the emphasis on "Green environment" and "Guarding Guiting-Guiting" highlights a collective commitment to preserving the natural beauty and ecological integrity of Mount Guiting-Guiting. By addressing these various aspects, climbers can work together to cultivate a culture of safety, sustainability, and appreciation for the unique experience that this mountain offers.

Lived Experience

Safety Measures and Preparedness

Considering the risks identified during climbs, such as extreme weather conditions, architectural features, and access to essentials, it would be beneficial to focus on enhancing safety measures and preparedness for climbers. Providing training sessions, guidelines for proper gear, and ensuring climbers are physically and mentally prepared for the challenges can help mitigate risks and ensure a safer climbing experience.

Tourist Satisfaction and Experience

To enhance tourist satisfaction and overall experience, it is important to continue highlighting the positive aspects that contribute to climbers' enjoyment, such as breathtaking scenery, interaction with knowledgeable guides and porters, and the sense of accomplishment. Efforts to maintain a welcoming and supportive local community can also significantly impact tourists' experiences.

Perceived Risks and Decision-Making

Understanding climbers' perceptions of risks and the decision-making process is crucial. By acknowledging the factors that influence climbers' revisit intention, such as the difficulty level, weather conditions, and personal well-being, strategies can be developed to address these concerns effectively. Providing accurate information on the challenges and rewards of climbing Mount Guiting-Guiting can help climbers make informed decisions.

Ancillary Factors and Support

The support from local communities, tour guides, and facilities plays a significant role in climbers' satisfaction. Enhancing facilities with minimal environmental impact, improving communication channels, and ensuring reliable support systems can contribute to a more positive and fulfilling climbing experience for tourists.

Continuous Improvement and Collaboration.

Encouraging collaboration between climbers, local communities, and authorities for the improvement of Mount Guiting-Guiting experiences is essential. Implementing climbers' suggestions for trail maintenance, safety protocols, and environmental conservation can lead to sustainable practices and a better overall experience for all stakeholders.

Education and Awareness.

Increasing awareness about the unique challenges and rewards of climbing Mount Guiting-Guiting can help manage climbers' expectations and foster a deeper appreciation for the natural environment. Providing educational resources, workshops on sustainable hiking practices, and promoting responsible tourism can contribute to a more positive and respectful relationship between climbers and the mountain ecosystem. Additionally, the LGU and the MGGNP may devise a handbook that would serve as a guide on climbing G2.

Health and Wellness Assessment.

It is strongly recommended to establish a dedicated medical station at the base of G2 for assessing the health condition of mountaineers before permitting them to undertake the hiking expedition. The research sheds light on the unique challenges and risks faced by mountaineers during their ascent of G2, emphasizing the physical and psychological demands of such an arduous endeavor. By implementing a medical station equipped with qualified healthcare professionals and necessary diagnostic tools, mountaineers can undergo comprehensive health assessments to ensure their fitness and readiness for the expedition. This proactive measure not only safeguards the well-being of the individuals but also enhances overall safety protocols, mitigating potential health emergencies or complications that may arise during the climb. Furthermore, providing access to pre-hike medical evaluations demonstrates a commitment to promoting responsible adventure tourism practices and prioritizing the welfare of mountaineers, thereby contributing to a more sustainable and ethically sound approach to mountain tourism on G2.

CONCLUSION

Based on the comprehensive analysis and interpretation of the data gathered from local mountaineers' perspectives on their experiences at Mount Guiting-Guiting in Sibuyan Island, it can be concluded that various key themes emerged that influence their revisit intentions.

The study revealed that factors such as perceived risks, tourist satisfaction, and tourist experience play crucial roles in shaping mountaineers' decisions to revisit Mount Guiting-Guiting. The encountered risks, climbing satisfaction, climbers' perceived risks, ancillary factors and tourist satisfaction, climbers' perceived difficulty, choice of other destinations, and climbers' suggestions for improving the G2 experience were thoroughly discussed and analyzed.

Mountaineers highlighted the importance of careful decision-making, crucial reasons related to perceived risks, and considerations for climbers' well-being when deciding to climb G2. The overall satisfaction derived from the climb, the breathtaking scenery, the guides' professionalism, and the local community support significantly influenced tourists' experiences and revisit intentions. Furthermore, the study uncovered that climbers' perceptions of the difficulty of G2 varied, with some considering it a tough climb while others viewed it as average. This discrepancy may influence their choices to revisit the mountain or explore other destinations for new experiences and challenges in mountaineering.

Lastly, climbers provided valuable insights and suggestions for improving the G2 experience, emphasizing the need for environmental conservation, community collaboration, safety protocols, and overall satisfaction enhancement. By addressing these recommendations, climbers can work towards creating a more sustainable, enjoyable, and well-rounded climbing experience at Mount Guiting-Guiting.

Summing it all up, the study highlights the complex interplay of factors that influence mountaineers' decisions to revisit Mount Guiting-Guiting, underscoring the significance of addressing perceived risks, enhancing tourist satisfaction, and continually improving the overall climbing experience to promote sustainability and safety while preserving the natural beauty of the mountain. By taking into account these crucial aspects, stakeholders can uphold Mt. Guiting-Guiting as a leading and enduring adventure tourism destination for future generations.

AUTHOR'S CONTRIBUTIONS

The authors declare equal contributions.

CONFLICT OF INTEREST

The authors declare no financial, personal, or professional conflicts of interest that could have influenced this dissertation's research, analysis, or findings.

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The First Record of Noah's Giant Clam *Tridacna noae* (Röding, 1798) (Cardiidae: Tridacninae) with Notes on Population and Associated Giant Clam Species in Romblon, Philippines

Jeric B. Gonzalez and Xyrra Jeremiah Mazo-Gonzalez

ABSTRACT

This study reports the first confirmed record of *Tridacna noae* (Röding, 1798) in Carmen Bay, Romblon, Philippines, expanding the known distribution of the species within the region. Field surveys were conducted from January to March 2021 using modified belt transect methods across four sites, comprising both protected (sites 1 and 2) and non-protected areas (sites 3 and 4). A total of 171 giant clams, representing three species, were identified: *Tridacna crocea* (n = 140), *T. maxima* (n = 31), and *T. noae* (n = 10). Tridacna crocea was the most abundant species, while *T. noae* exhibited the lowest abundance. Both *T. maxima* and *T. noae* were restricted exclusively to marine protected areas. Population densities were markedly higher in protected sites (580 and 527 individuals per hectare) compared to non-protected areas (20 and 13 individuals per hectare), highlighting the critical role of marine protected areas in conserving tridacnid populations. The limited distribution and low population density of *T. noae* and *T. maxima* within the study area suggest that they are potentially vulnerable to anthropogenic pressures and habitat degradation. These findings provide essential baseline data on the occurrence, abundance, and spatial distribution of *T. noae*, underscoring the need for enhanced conservation strategies to safeguard giant clam biodiversity in the Philippines.

Keywords: *abundance, Carmen Bay, density, non-protected area, protected area*

INTRODUCTION

Tridacna noae, commonly known as the Noah's Ark clam or the small giant clam, is a species of large marine clam that belongs to the family Cardiidae (Borsa et al., 2015). It is one of the several species of giant clams found in the Indo-Pacific region (Borsa et al., 2014; Marra-Biggs et al., 2022; Militz et al., 2015; Neo & Low, 2018). It is one of the smaller species of giant clams, typically reaching a maximum length of about 30 centimeters (12 inches). The shell of this species is elongated and symmetrical, with a slightly curved shape (Triadiza et al., 2019). Like other giant clams, the mantle of *Tridacna noae* exhibits a highly complex and intricate pattern, distinguishing it from other giant clam species (Su et al., 2014). It features a diverse range of colors, including shades of blue, green, brown, and gold, often forming elaborate designs across its surface (Borsa et al., 2015). One of its most striking characteristics is the presence of large, dark ocelli (eye-like spots), which are more pronounced and well-defined compared to the more minor, scattered spots found in *T. maxima* (Ecube et al., 2019). These ocelli are typically surrounded by lighter or iridescent rings, creating a visually striking contrast (Su et al., 2014). Additionally, the mantle may display a network of fine, wavy lines, blotches, or intricate reticulations, contributing to its unique appearance (Borsa et al., 2015). These unique patterns aid researchers and marine biologists in field identification, reducing the likelihood of misidentification, which has been a common issue due to the species' close resemblance to *T. maxima* (Morejohn et al., 2023). This species is typically found in shallow, tropical marine habitats such as coral reefs and lagoons (Ecube et al., 2019, 2024). It requires clear and well-lit waters for its symbiotic relationship with the zooxanthellae algae (Soo & Todd, 2014). Along with other giant clam species, it has faced significant threats from overharvesting and habitat degradation (Watson &

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Neo, 2021). As a result, it is considered vulnerable and protected under various international agreements and conservation initiatives (Davila et al., 2017; Neo & Li, 2024). In the Philippines, all giant clams are protected under Republic Act 9147 or the Philippine Wildlife Act, Republic Act 10654 or the Amended Fishery Law, and Department of Agriculture-Department Administrative Order 208 series of 2001, also known as the conservation and protection of rare, threatened, and endangered aquatic species and updating the listed species. This small giant clam is primarily found in the Indo-Pacific region (Marra-Biggs et al., 2022). Its distribution range spans from the eastern coast of Africa and the Red Sea, across the Indian Ocean, to the western Pacific Ocean (Borsa et al., 2014). In the Philippines, *Tridacna noae* can be found in coral reef ecosystems and shallow marine habitats. Some specific locations where it has been reported in eastern Negros Island (Borsa et al., 2015; Marra-Biggs et al., 2022; Militz et al., 2015; Neo & Low, 2018), San Vicente, Palawan (Ecube et al., 2019), and Culion Island, Palawan (Mecha, 2024).

This study aims to document the first recorded occurrence, population, and abundance of *Tridacna noae* (Röding, 1798) in Romblon, Philippines. It contributes to the understanding of local marine biodiversity, highlights conservation needs for this potentially vulnerable species, and underscores the importance of giant clams in coral reef ecosystems. Additionally, it adds valuable data to the taxonomy and distribution of giant clams, supporting future research and conservation efforts.

METHODOLOGY

Sampling Site

The survey was conducted in the protected area of Carmen Bay, Romblon, Philippines, specifically in the Cabolutan Fish Sanctuary and non-protected areas, including the gleaning regions of barangay Carmen and Sugod, from January to March 2021. Carmen Bay is a small bay located in the north of Tablas Island, Romblon, Philippines (Figure 1). It is geographically located in the Municipality of San Agustin, Romblon, Philippines. This bay is bounded by three barangays of San Agustin, namely, Cabolutan, Carmen, and Sugod. In addition, the bay faces the Romblon Passage, an essential corridor for migratory species such as tuna, sea turtles, and other endangered and commercially important marine species, as well as a habitat for other marine organisms, including giant clams. It is also considered the most exploited fishing ground in the

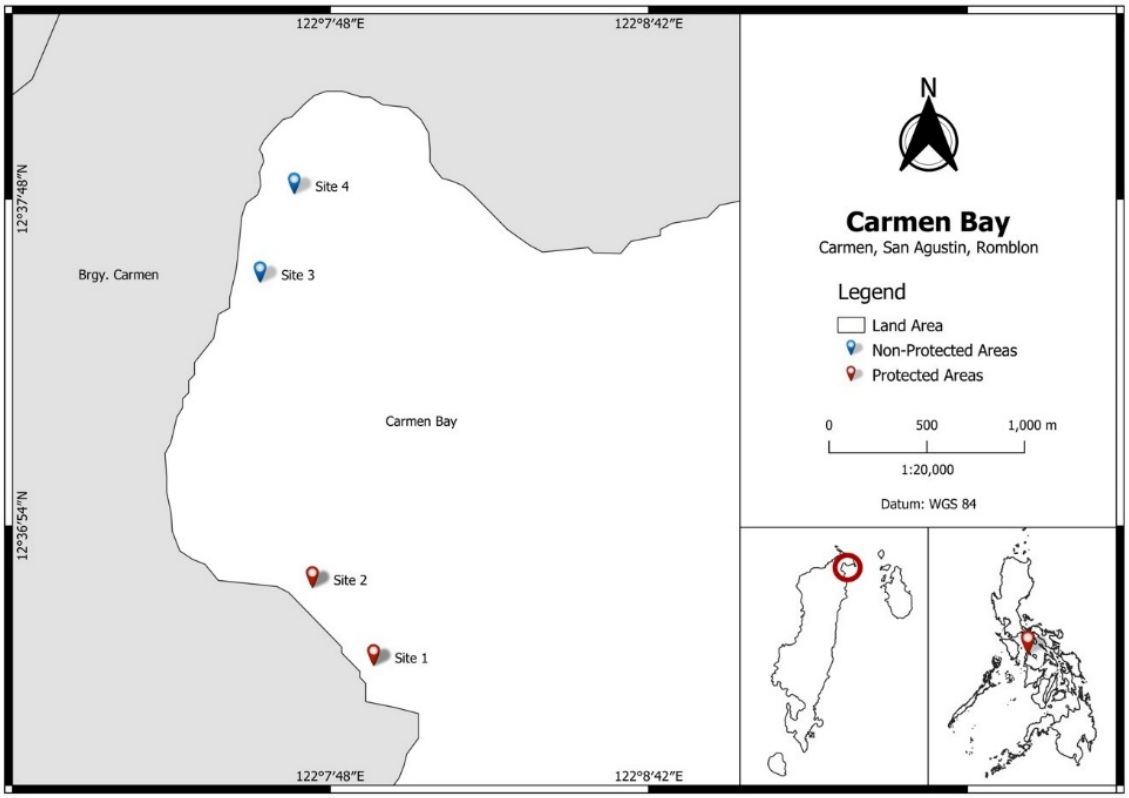

Figure 1. The map of Carmen Bay in San Agustin Romblon, Philippines. Red pins indicate the sampling sites in Cabolutan Fish Sanctuary, and blue pins indicate the location of the sampling sites in none protected area in the bay.

Figure 2. Photos of giant clams in Carmen Bay, Romblon, Philippines. *Tridacna crocea* (A), *T. maxima* (B), *T. noae*, (C), focus image mantel pattern of *T. noae* (D).

Country [Sentro Para sa Ikauunlad ng Katutubong Agham at Teknolohiya Inc (SIKAT), 2013].

Sampling Method

The survey of giant clams was conducted in the shallow waters (about 1 meter deep) of Carmen Bay, Romblon, Philippines. Researchers established four sampling sites, each with three transects perpendicular to the shore, for data collection. Each transect measured 50 x 10 meters.

Sampling Site

Sites 1 and 2 were located within the Cabolutan-Carmen Fish Sanctuary, a protected area, while sites 3 and 4 were outside the sanctuary. The team employed the modified belt transect method, as described by English et al. (1997), to guide the survey, which was conducted during daytime low tides.

Identification of Giant Clams

Identification was based on the morphological characteristics of giant clams, including their habits, mantle pattern, and photographs. An identification guide from the Fisheries Administrative Order (FAO) and the World Register of Marine Species (WORMS) was used for species identification. Sending giant clam photos to the expert online was also done for further verification.

Survey on Abundance and Population Density

All giant clams found within the 50x10 meters transect were counted for population density and measured for shell dimension (Knop, 1996). All giant clam species identified were counted and analyzed using Microsoft Excel. Photography was done for future identification and documentation purposes. Sample photos that were not identified were sent to experts from other institutions.

Data Analysis

All identified giant clam species were counted to determine species composition. The collected data on giant clams were processed and analyzed using Microsoft Excel to assess their population and abundance. A two-tailed independent sample t-test was conducted to determine whether there were significant differences in abundance and population density between sites.

FINDINGS AND DISCUSSION

The Giant Clams in Carmen Bay, Romblon, Philippines

Three species of small giant clams, *Tridacna crocea* (Figure 2A), *Tridacna maxima* (Figure 2B), and *Tridacna noae* (Figure 2C&D) were found and identified in Carmen Bay, Romblon. Notably, this marks the first recorded occurrence of *T. noae* in Romblon province (Figure 2). Among these three species recorded, *T. crocea* was present in all sites, while *T. maxima* and *T. noae* were only found in the protected area of Carmen Bay, Romblon. Among three giant clams, *T. noae* has the highest mean shell length of 9.40 cm, followed by *T. maxima* with 6.96 cm mean shell length and *T. crocea* with 6.22 cm mean shell length. *Tridacna noae*, commonly known as Noah's giant clam, is often mistaken for *Tridacna maxima* due to their similar appearance, but several distinct morphological features differentiate the two (Su et al., 2014; Su et al., 2021). The shell of *T. noae* is elongated and roughly symmetrical, with prominent radial folds or ridges. It typically grows up to 40 cm in length, making it smaller than *T. gigas* but comparable in size to *T. maxima* (Ecube et al., 2019; Marra-Biggs et al., 2022; Su et al., 2021). The shell is generally white to cream-colored, often marked with brownish patterns, and features well-developed scutes along the ridges, a characteristic that helps distinguish it from *T. maxima* (Borsa et al., 2015; Marra-Biggs et al., 2022). The mantle of *T. noae* displays a striking variety of colors, including shades of black, brown, and gold, often adorned with intricate patterns of spots, white lines, or blotches (Su et al., 2014). One of the most distinguishing features is the presence of large, dark ocelli (spots) on the mantle, which are more defined compared to the more minor, scattered spots seen in *T. maxima* (Rossbach et al., 2020). Around the incurrent siphon, short, non-retractile siphonal tentacles are present. The hinge area of *T. noae* is relatively small, and its byssal opening is narrow, allowing the clam to attach firmly to rigid coral substrates (Su et al., 2014).

Tridacan noae, along with *T. crocea and T. maxima*, is primarily found in shallow tropical coral reefs, often nestled within coral crevices or growing attached to rocky surfaces. This type of habitat condition was also observed in the sampling sites in Carmen Bay, Romblon (Borsa et al., 2014; Lee et al., 2024; Rossbach et al., 2021). Its distribution spans across the Indo-Pacific region, including Southeast Asia, Australia, and the Pacific Islands (Borsa et al., 2015; Marra-Biggs et al., 2022; Militz et al., 2015; Neo & Low, 2018). In the Philippines, *Tridacna noae*, commonly known as Noah's giant clam, has been identified in several locations across the Philippines, with notable occurrences in Palawan (Ecube et al., 2019; Mecha, 2024). The first report of *T. noae* in the country was from eastern Negros, based on mitochondrial DNA sequences retrieved from open-access databases (Viray-Mendoza, 2018). Subsequent observations have expanded its known distribution, particularly within Palawan. In 2019, a specimen measuring 4.5 cm in shell length was documented in Port Barton, San Vicente (Ecube et al., 2019). Later, in 2024, two juvenile specimens, each approximately 7.8 cm in shell length, were discovered partially buried in dead coral substrates at a depth of 2 meters in Barangay Malaking Patag, Culion (Mecha, 2024). These findings suggest a broader distribution of *T. noae* across the Philippines; however, comprehensive studies are still needed to understand its range and population status in the country fully. The unique combination of shell morphology, mantle coloration, and habitat preference helps distinguish *Tridacna noae* from other giant clam species, making it an essential species in marine biodiversity studies.

Table 1. Abundance and population density of giant clams in Carmen Bay, Romblon, Philippines. Site 1 & 2 (protected area), Site 3 & 4 (non-protected area)

Site	Species	No. of giant clams	Density (giant clam/ha)
1	*T. crocea*	81	540
	T. maxima	12	80
	T. noae	7	47
	Total	**87***	**580**
2*	*T. crocea*	55	367
	T. maxima	19	127
	T. noae	3	20
	Total	**79***	527
3	*T. crocea*	2	13
	T. maxima		
	T. noae		
	Total	**3**	20
4	*T. crocea*	2	13
	T. maxima		
	T. noae		
	Total	**2**	13

Note * Significance difference (p-value 0.029)

Abundance of Giant Clams in Carmen Bay, Romblon, Philippines

A total of 181 ±27.51 giant clams were recorded in the shallow waters of Carmen Bay, Romblon. Among the three identified species, Tridacna crocea was the most abundant, with 140 ±34.26 individuals. This was

followed by *T. maxima*, with 31 ±3.5 individuals, and *T. noae*, with the lowest count of 10 ±2.0 individuals. The two protected sites (Sites 1 and 2) exhibited significantly higher (p-value=0.029) in terms of abundance and densities of giant clams, with 667 clams/ha in Site1 and 513 clams/ha in Site 2, compared to the non-protected sites (Sites 3 and 4), which recorded only 13 clams/ha for both sites (Table 1). These findings strongly suggest that marine protected areas (MPAs) play a critical role in sustaining giant clam populations by providing a safer environment with reduced human disturbances and better habitat conditions (Solandt et al., 2025).

Among the three identified species, *Tridacna crocea* was the most dominant, accounting for the majority of the recorded individuals across all sites. It was particularly abundant in the protected areas, with 81 individuals in Site 1 (540 clams per hectare) and 55 individuals in Site 2 (367 clams per hectare). This species was also found in non-protected areas, but in drastically lower numbers, with only two individuals each in Sites 3 and 4 (13 clams/ha per site). The ability of *T. crocea* to persist in lower numbers in non-protected areas may suggest that it has a higher tolerance to environmental stressors or human disturbances compared to other giant clam species (Liu et al., 2020). *Tridacna maxima* was found only in the protected sites, with 12 individuals in Site 1 (80 clams per hectare) and 19 individuals in Site 2 (127 clams per hectare). Its complete absence in non-protected areas suggests that this species may be more sensitive to environmental changes, overharvesting, or habitat degradation, making it highly dependent on protected areas for survival (Pulido-Chadid et al., 2023). *Tridacna noae* was the rarest species observed, with only 7 individuals in Site 1 (47 clams per hectare) and 3 individuals in Site 2 (20 clams per hectare). Its absence in non-protected areas further highlights its vulnerability and potential risk of local extinction due to external pressures (Ameca et al., 2024). The low numbers of *T. noae* could be attributed to its naturally lower population density or possible misidentification issues in past surveys, as it closely resembles *T. maxima* (Marra-Biggs et al., 2022; Neo & Low, 2018).

The dramatic decrease in population density from protected to non-protected areas suggests that human activities, including illegal harvesting, habitat destruction, and water quality degradation, may be key factors influencing the distribution of giant clams (Siburian et al., 2024). Overharvesting is a significant concern, as giant clams are highly valued for their meat, shells, and use in the aquarium trade (Gomez & Mingoa-Licuanan, 2006). Additionally, habitat degradation due to coastal development, pollution, and climate change may further contribute to the decline of these species in non-protected areas (Watson & Neo, 2021).

The results show the critical role of marine protected areas in conserving giant clam populations. The significantly higher densities observed in Sites 1 and 2 demonstrate that protection efforts have been effective in maintaining suitable conditions for the survival and recruitment of giant clams. However, the low numbers in non-protected areas emphasize the urgent need for stronger conservation measures, including the potential expansion of protected zones, stricter enforcement of fishing regulations, and active habitat restoration efforts in degraded areas.

CONCLUSION

The present study provides the first documented occurrence of *Tridacna noae* in Carmen Bay, Romblon, Philippines, alongside *Tridacna crocea* and *Tridacna maxima*. The findings demonstrate a clear disparity in giant clam abundance between protected and non-protected areas, with significantly higher densities observed within marine protected zones. The restricted presence of *T. noae* solely within protected areas, coupled with its low population density, indicates its heightened sensitivity to anthropogenic disturbances and potential risk of local decline. These results underscore the crucial role of marine protected areas (MPAs) in preserving tridacnid populations by mitigating threats such as overexploitation and habitat degradation. Furthermore, the study underscores the necessity for expanded conservation efforts, strict enforcement of protective regulations, and long-term monitoring programs to support the recovery and persistence of vulnerable giant clam species, particularly *T. noae*, within Philippine reef ecosystems. These baseline data contribute to the broader understanding of tridacnid distribution and population dynamics, supporting future biodiversity management and conservation initiatives.

AUTHORS' CONTRIBUTIONS

All authors are involved during the conceptualization, data collection, data processing and interpretation, write-up and revision.

CONFLICT OF INTEREST

The authors declare no competing interests.

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Analyzing the Determinants of Entrepreneurial Intentions between Business and Non-Business Students at a State University

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ABSTRACT

Given the crucial role of entrepreneurship in driving economic growth and job creation, understanding the factors that shape entrepreneurial intentions has become essential for developing effective support systems and educational strategies. This research aims to investigate the influence of perceived educational (university) support (PES), perceived relational (family) support (PRS) and perceived structural (government/institutional) support (PSS) on the entrepreneurial intentions (EI) of both business and non-business students. It further seeks to determine whether significant differences exist between these two groups regarding their perceived support and entrepreneurial intention levels. Using a purposive sampling technique, a total of 300 students, comprising 150 business and 150 non-business students, from five state university colleges participated in the study through a Google Form questionnaire. A comparative causal research design was employed to explore the relationships among the variables. The findings revealed that PES, PRS, and EI were higher among business students, while PSS was lower. However, the Mann-Whitney U test indicated no significant difference between business and non-business students regarding their perceptions of support and entrepreneurial intentions. Moreover, multiple linear regression analysis showed that PES, PRS, and PSS significantly and positively influence students' entrepreneurial intentions. The study recommends that universities, families, peer networks, and government institutions strengthen their support mechanisms to foster a more conducive environment for nurturing entrepreneurial aspirations among students, regardless of academic discipline.

Keywords: *entrepreneurial support, entrepreneurial intention, theory of planned behavior*

INTRODUCTION

Since entrepreneurship is seen as the catalyst of economic growth, it is a rapidly developing topic that is currently attracting a lot of interest from academics and researchers. By generating jobs, entrepreneurs not only make money for themselves but also for others. Understanding what makes great entrepreneurs tick has wider societal ramifications. Scholars studying entrepreneurship have been interested in what makes someone an entrepreneur. Examining the variables that influence entrepreneurial intention is, in this regard, one of the most vital study directions.

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Entrepreneurship education has become a focal point in higher education institutions internationally, aiming to cultivate entrepreneurial mindsets, skills, and intentions among students. Fayolle and Liñán (2014) pointed out the significance of entrepreneurial intentions as a key predictor of entrepreneurial behavior, indicating the importance of comprehending and fostering these intentions among university students.

In the Philippine context, the Department of Trade and Industry (2017) outlined the Philippine Development Plan 2017-2022, which gives emphasis on the promotion of entrepreneurship as a key driver for economic development, job creation, and poverty reduction. This national agenda elaborates the importance of understanding the entrepreneurial landscape and identifying strategies to promote entrepreneurial intentions among Filipino students.

Despite the growing body of literature on entrepreneurship education and entrepreneurial intentions, there remains a research gap in comprehending the comparative analysis of perceptions

and intentions among business and non-business students in the Philippines. Nevertheless, there is still a need for more comprehensive studies that integrate these findings with the broader literature on entrepreneurship education, entrepreneurial intentions, and national development agendas like the Philippine Development Plan.

Furthermore, the comparative analysis between business and non-business students provides a holistic view of the entrepreneurial ecosystem, uncovering nuanced differences and similarities. Understanding these differences can direct educational institutions in benchmarking their performance, learning from each other's strengths and weaknesses, and promoting a culture of entrepreneurship. The broader perspective of comparing perceptions across all business programs further improves the understanding of the entrepreneurial landscape, offering insights that may not be evident when focusing primarily on specific subsets of the student population. These insights significantly affect policy formulation, curriculum development, and stakeholder engagement. By aligning educational offerings with industry needs, fostering partnerships, and building an enabling landscape for aspiring entrepreneurs, universities can boost innovation, economic growth, and development.

This study extends to various stakeholders, including universities, university students, aspiring entrepreneurs, parents and the community, government agencies, and future researchers.

Review of Related Literature

Relationship between University Support and Entrepreneurial Intention

According to Anjum et al (2021), universities are thought to be a better place to encourage creativity and an entrepreneurial mindset. In order to positively influence students' entrepreneurial intentions (EI) and enable them to venture into a new business, universities can play a big part. Consequently, we think that colleges are a central venue for encouraging students' entrepreneurial passion. Probing how much educational institutions influence students' aspirations to become entrepreneurs is significant. This might be accomplished, for instance, by looking into how students perceive their experiences at university in relation to their EI. Universities can help in specific ways by imparting the information and abilities required to initiate a business. Universities may also provide student-focused assistance. The assistance that is being eyed can include assistance with the idea and business growth. Besides the fact that creativity is ideally thought of in terms of personality qualities, research suggests that creativity may be responsive to its surroundings, meaning that outside factors may have an effect on creativity. Research suggests, for instance, that students' creativity may be influenced by their university environment.

Entrepreneurship education, according to Lestari and Sukirman (2020), is knowledge obtained by students from educational institutions through a well-developed curriculum that fuses foundational concepts and approaches with practical life skills.

Several factors can be used to quantify entrepreneurship education, according to a study conducted by Hassan et al. (2020). A few of these indicators include understanding the entrepreneurial environment, being more conscious of the characteristics of an entrepreneur, having the desire to commence your own business, having the skills necessary to do so, and intending to do so.

In this case, a functional campus is necessary to maximize students who have business entrepreneurial intentions. Thus, the intention can later be realized well, not only in the form of intention but also in real action, which eventually will become a momentum to expand the number of entrepreneurs in the country (Sari, M., et al., 2021).

Consequently, there is a need for systematic approaches to assess the impact of various motivational determinants linked to the university's entrepreneurial landscape that could enhance the EI of students (Bazan et al, 2020).

Relationship between Relational Support and Entrepreneurial Intention

Based on a research study, students who originated from entrepreneurial families expressed a stronger desire to start their own business than those who did not (Georgescu & Herman, 2020).

Samuel et al. (2013) expressed that a student's inclination to begin their own business is hugely influenced by their gender and family history. Students from families with a history of business are more aware of and engaged in entrepreneurship.

People's social environments are another demographic concern. Entrepreneurial attitudes and general entrepreneurial aspirations are encouraged by a supportive social context (family, friends, etc., or social norms). As a result, a person's desire to commence their own business expands with how supportive their surroundings are of their entrepreneurial aspirations. In addition, a number of studies, including one by Gubik and Farkas (2019), have noted that students' entrepreneurial ideas are also influenced by their education and their family's business background.

Relationship between Institutional Support and Entrepreneurial Intention

The United Nations Educational, Scientific, and Cultural Organization (UNESCO) laid out the case for education that prioritizes the development of employable skills over solely preparing students for the workforce. A comprehensive strategy is vital for successful entrepreneurship education, with a focus on reshaping students' attitudes and behaviors. While entrepreneurship is a fundamental component and major economic driver, it is significant that governments and educational institutions determine creative strategies to inspire students to pursue entrepreneurial endeavors (Swarupa & Goyal, 2020).

According to Vidal-Suñé and López-Panisello (2013), government and economic policies motivate students to go after their entrepreneurial goals. They were found to significantly influence the intention to commence a business.

The greatest influence on the ambition to begin a business venture is also shown in government backing. This paper provides a complete framework that helps in conceptualization and complements academic institutions and the government in improving curricula and abilities to inspire business students to become successful entrepreneurs in the coming years (Debbarma S., et al., 2022; Nordin N. M. et al, 2024).

The Theory of Planned Behavior, or TPB (Ajzen, 1991), is one of the most well-known psychological theories for describing and forecasting human behavior because of its consistency. This theory's models have been efficiently used in the entrepreneurial setting to forecast the specific actions involved in opening up a new business. More so, it has proven to be an effective tool for assessing students' entrepreneurial intention in a complex of cultural contexts.

Conceptual Framework

Figure 1 models the influence of perceived support from educational institutions, social networks, and institutional support on entrepreneurial intention.

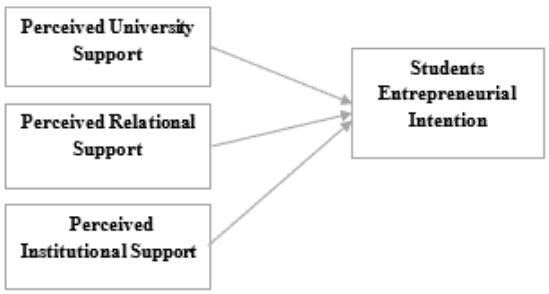

Figure 1. Conceptual Framework

METHODOLOGY

The Comparative Causal Research Design employed by the researcher represents a methodical approach to understanding the relationship between perceived support and entrepreneurial intention, specifically between business and non-business student groups.

The population of the study comprises students from the main campus, specifically from its five colleges: College of Arts and Sciences (CAS), Institute of Information Technology (IIT), College of Education (CED), College of Engineering and Technology (CET), and the College of Business and Accountancy (CBA).

The sampling method is purposive sampling, where the researcher intentionally selects participants based on specific criteria relevant to the research objectives. In this case, the researcher identified and selected 150 business students and 150 non-business students to ensure representation from both groups. Each category comprises 150 students, making up 50.0% of each sample. This indicates an equal representation of business and non-business students in the sample, accounting for half of the total population surveyed.

The measures for University support, relational support, and structural support were adapted from Turker and Selcuk (2009), and Entrepreneurial Intention indicators were adapted from Liñán et al. (2011).

Since the research questionnaire was adapted from established previous studies, a validity test was not deemed necessary. To ensure the reliability of the questionnaire, the researcher conducted a pre-test with a sample of 16 students who were not part of the actual data collection process. The pre-test results showed that all the Cronbach's alpha values for the scales used were above 0.70, indicating good internal consistency and reliability of the survey items.

Table 1 shows the internal consistency of four variables measured by their Cronbach's Alpha and Standardized Alpha values. Perceived Educational Support has a Cronbach's Alpha of 0.71, indicating acceptable reliability.

The data gathering procedure involves systematically disseminating a Google Forms survey to students across the different colleges within the state university main campus. The researcher then prepares a comprehensive survey questionnaire using Google

Table 1. Reliability Test Results

Variables	Cronbach Alpha
Perceived Educational Support	0.71
Perceived Relational Support	0.91
Perceived Institutional Support	0.84
Entrepreneurial Intention	0.99

Table 2. Mann–Whitney U Test Results and Descriptive Statistics for Perceived Support and Entrepreneurial Intention by Group

Variable	Group	Mean	Med	SD	SE	*U*	*p*
Perceived Educational Support (PES)	Business	3.59	3.67	.480	.0376	10285	.171
	Nonbusiness	3.46	3.67	.618	.0505		
Perceived Relational Support (PRS)	Business	3.65	3.83	.418	.0341	10238	.155
	Nonbusiness	3.56	3.67	.468	.0382		
Perceived Structural Support (PSS)	Business	3.33	3.25	.508	.0415	10981	.714
	Nonbusiness	3.34	3.25	.592	.0484		
Entrepreneurial Intention (EI)	Business	3.44	3.50	.522	.0427	9976	.083
	Nonbusiness	3.27	3.17	.696	.0568		

Table 3. Multiple Linear Regression Predicting Entrepreneurial Intention from Perceived Support Dimensions

Model Fit Statistics						
Model	**R**	**R²**	**F**	**df1**	**df2**	**p**
1	0.637	0.406	67.3	3	296	< .001
Model Coefficients - Entrepreneurial Intention (EI)						
Predictor			Estimate	SE	T	p
Intercept			-0.00320	0.2521	-0.0127	0.990
Perceived Educational Support (PES)			0.22047	0.0587	3.7554	< .001
Perceived Relational Support (PRS)			0.34101	0.0714	4.7790	< .001
Perceived Structural Support (PSS)			0.40557	0.0599	6.7706	< .001

Forms, which includes items related to perceived support (educational, relational, and structural) and entrepreneurial intention. Once the survey is finalized, it is distributed to students via email or other communication channels, with instructions on completing it.

After data gathering, the researcher proceeded with data analysis, employing descriptive and inferential statistical methods to examine the collected data.

RESULTS AND DISCUSSION

In Table 2, the results of the Independent Samples T-Test examine the differences between business and non-business students in their perceived levels of educational support (PES), relational support (PRS), structural support (PSS), and entrepreneurial intention (EI).

The descriptive statistics show that business students reported slightly higher mean scores across all variables than non-business students. Specifically, the mean score for Perceived Educational Support (PES) was higher among business students (M = 3.59, SD = 0.46) than among non-business students (M = 3.46, SD = 0.62). Similarly, business students scored higher on Perceived Relational Support (PRS) (M = 3.65, SD = 0.42) compared to non-business students (M = 3.56, SD = 0.47) and on Entrepreneurial Intention (EI) (M = 3.44, SD = 0.52) compared to their non-business counterparts (M = 3.27, SD = 0.70). For Perceived Structural Support (PSS), business students had a slightly lower mean (M = 3.33, SD = 0.51) than non-business students (M = 3.34, SD = 0.59), though the difference was minimal.

Despite these differences in mean scores, the Mann-Whitney U test results indicate that none of the differences between the two groups were statistically significant: PES (p = .171), PRS (p = .155), PSS (p = .714), and EI (p = .083).

In Table 3, the Overall Model Test indicates the overall performance of the regression model in predicting Entrepreneurial Intention (EI). The model exhibits a significant relationship (R^2=0.406), indicating that approximately 40.6% of the variance in EI can be explained by the combination of the predictors (PES, PRS, and PSS). The F-test statistic of 67.3 with 3 and 296 degrees of freedom is significant at $p < .001$, suggesting that the model as a whole is statistically significant in predicting EI.

Looking at the Model Coefficients specifically for Entrepreneurial Intention (EI), each predictor variable's coefficient estimates, standard errors (SE), t-values, and associated p-values are provided. Each predictor variable—Perceived Educational Support (PES), Perceived Relational Support (PRS), and Perceived Structural Support (PSS)—shows significant positive relationships with EI, with p-values < .001. This suggests that higher levels of perceived educational, relational, and structural support are associated with greater entrepreneurial intention among participants after accounting for the other variables in the model.

CONCLUSION

Students generally perceive a positive level of educational, relational, and structural support for entrepreneurship, albeit with variations across different aspects of these support systems.

Perceived educational, relational, and structural support are significant positive predictors of entrepreneurial intention, collectively explaining a substantial portion (40.6%) of the variance in entrepreneurial intention.

There are no significant differences in perceived support levels and entrepreneurial intention between business and non-business students, suggesting that entrepreneurial mindsets and intentions are not exclusively limited to business students.

Thus, it is recommended that entrepreneurship education and curricula be enhanced to equip students with practical skills, knowledge, and hands-on experiences in starting and running businesses, going beyond just theoretical knowledge. Create a positive environment that nurtures entrepreneurial aspirations by offering continuous emotional support and encouragement to help them stay motivated. Implement policies and initiatives that promote entrepreneurship education at all levels of the education system, starting from primary and secondary schools, to instill an entrepreneurial mindset from an early age. Conduct longitudinal studies to investigate the long-term impact of educational, relational, and structural support on entrepreneurial intentions and actual business creation. Strengthen collaborations with successful entrepreneurs, industry experts, and business incubators to provide mentorship, guidance, and real-world insights to students interested in entrepreneurship. Recognize and celebrate entrepreneurial successes and milestones, fostering a sense of pride and motivation. This reinforcement encourages continued effort and perseverance. Streamline bureaucratic processes and regulations related to business registration, licensing, and compliance to create a more supportive and accessible environment for new business ventures. Examine the role of different relational support sources (e.g., mentors, professional networks, community organizations) and their relative impact on entrepreneurial intentions and success.

Explore the effectiveness of interventions and support programs to foster entrepreneurial intentions and success and identify best practices for promoting entrepreneurship.

Universities and policymakers should strengthen educational programs, foster supportive relationships (especially within families), and improve structural support mechanisms, such as access to financing, to create an environment conducive to entrepreneurship.

AUTHOR'S CONTRIBUTIONS

Conceptualization, R.H.G. and E.J.G.E.; methodology, R.H.G. and E.J.G.E.; software, R.H.G.; formal analysis, E.J.G.E.; resources, R.H.G. and E.J.G.E.; data curation, R.H.G. and E.J.G.E.; writing—original draft, R.H.G.; writing—review and editing, E.J.G.E.; visualization, E.J.G.E.; supervision, E.J.G.E.; project administration, R.H.G. and E.J.G.E; funding acquisition, R.H.G. and E.J.G.E. All authors have read and agreed to the published version of the manuscript.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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Assessing Teachers' Pedagogy, Curriculum and Assessment Adherence to Philippine Professional Standards for Teachers

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ABSTRACTS

This study examined the level of adherence of public school teachers to the Philippine Professional Standards for Teachers (PPST), with a specific focus on the domains of content knowledge and pedagogy, curriculum and planning, and assessment and reporting. It further investigated whether adherence levels significantly differ across demographic and professional variables, including school level, sex, age, highest educational attainment, frequency of participation in professional development seminars, and length of service. Employing a descriptive-comparative research design using a survey method, the study drew data from 137 public school teachers selected through stratified random sampling. The sample size was determined using Slovin's formula at a 5% margin of error. Findings revealed that the overall level of adherence among both elementary and secondary school teachers was very satisfactory. Among the three domains, teachers demonstrated the strongest adherence to content knowledge and pedagogy, followed by assessment and reporting, and then curriculum and planning. Statistical analysis indicated a significant difference in adherence across age groups, whereas no significant differences were found based on sex, educational attainment, school level, frequency or sponsoring entity of professional development seminars, or tenure. These results underscore the importance of targeted support for teachers at different career stages, particularly in sustaining adherence to professional standards across age demographics.

Keywords: *content knowledge and pedagogy assessment, descriptive-comparative research in education, Philippine Professional Standards for Teachers, public school teacher performance, teacher adherence to professional standards*

INTRODUCTION

The Philippines has undergone significant reforms in its educational system, most notably with the enactment of Republic Act No. 10533, or the Enhanced Basic Education Act of 2013, signed into law by President Benigno S. Aquino III on May 15, 2013. This legislation extended the basic education cycle from 10 to 12 years and aimed to enhance the curriculum to better prepare Filipino learners for higher education, employment, and entrepreneurship.

In alignment with the objectives of the K to 12 Program, the Department of Education (DepEd) promulgated DepEd Order No. 42, s. 2017, entitled National Adoption and Implementation of the Philippine Professional Standards for Teachers (PPST). This policy established a comprehensive framework for teacher quality, designed to assess performance, identify professional development needs, and provide targeted support. It clearly delineates expectations for teacher proficiency across career stages—from beginning to distinguished practice—emphasizing the pivotal role of teachers in nation-building. High-quality teachers are seen as key to cultivating holistic, value-oriented learners equipped with 21st-century skills—individuals envisioned to contribute meaningfully to national progress. This aligns with DepEd's vision, as stated in DepEd Order No. 36, s. 2013, of producing competent, values-driven, and patriotic Filipinos.

In connection with the PPST's implementation, Gepila (2020) conducted a study focusing on the instructional proficiency of teachers in Southern Luzon. The study revealed that while most teachers rated

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themselves highly in managing the learning environment, they reported only moderate proficiency in addressing learner diversity. This underscores the ongoing need for teachers to enhance their responsiveness to diverse classroom needs. The findings further suggested that while teachers generally perceived themselves as proficient across the PPST domains, sustained individual and institutional efforts are necessary to elevate their practice and ensure community-wide educational benefits. Gepila emphasized that schools must focus on teacher competency to ensure the delivery of quality education.

This study centers on three of the seven PPST domains: Content Knowledge and Pedagogy, Curriculum and Planning, and Assessment and Reporting. These domains are foundational in evaluating teacher performance and guiding professional development.

The theoretical underpinning of the study draws from the framework of Pedagogical Content Knowledge (PCK), which represents the intersection of content mastery and effective instructional practice. Alonzo and Kim (2016) assert that PCK legitimizes the teaching profession by highlighting the integration of theoretical knowledge and classroom experience. Through training and reflective practice, PCK evolves into a dynamic force for instructional effectiveness.

DepEd Order No. 73, s. 2012 affirms that educators, having acquired foundational knowledge and understanding, are expected to deliver lessons with minimal supervision. However, reports from SEI-DOST and MATHTED (2011) suggest that many teachers still struggle with content mastery. Subject-matter expertise, as emphasized by Pompea and Walker (2017), is crucial in designing meaningful and responsive curricula.

The concept of critical pedagogy, as discussed by Cortez (2016), is often misunderstood in the Philippine context. Cortez (2013a, 2013b) notes the limited integration of Freirean philosophy in formal education and attributes this to a broader disconnection from Filipino philosophical traditions. Atim (2017) reinforces the role of critical pedagogy in analyzing contemporary sociopolitical and economic realities, while Viola (2009) critiques the impact of neoliberal structures on the Philippine education system, documenting stark inequalities in student experiences.

Curriculum design must also be responsive and relevant. Biggs and Tang (2007) advocate for learning environments that are contextually grounded and curriculum content that fosters student engagement and readiness for academic advancement. However, Ornstein and Hunkins (2018) lament that despite teachers' central role in instruction, they are often excluded from curriculum decision-making bodies. Caup and Buda (2017) maintain that the spiral progression embedded in the K to 12 curriculum equips learners with foundational knowledge before introducing more complex concepts, thus reinforcing mastery.

Assessment practices, according to Hussin (2018), are evolving to accommodate emerging learning paradigms. Plata (2018) affirms that Philippine education employs varied assessment strategies; however, there are lingering concerns about their alignment with real-world competencies. Despite the incorporation of both traditional and authentic assessment methods, the current system may still fall short in preparing students for the demands of the workforce.

It is within this context that the present study was conceptualized. It seeks to assess the extent to which public school teachers have adapted and aligned their professional practices with the three selected domains of the PPST: Content Knowledge and Pedagogy, Curriculum and Planning, and Assessment and Reporting. This assessment provides essential input for designing programs that further enhance teacher competence and the overall quality of education delivery.

The theoretical foundation of the study is anchored in self-efficacy theory, which refers to an individual's belief in their capacity to execute behaviors necessary to achieve specific performance outcomes. Learning, in this context, is viewed as a process through which self-efficacious behaviors are cultivated via mastery experiences, modeling, imitation, and social persuasion. These theoretical perspectives serve as the backbone of the study and enrich its conceptual framework.

METHODOLOGY

Research Design

A descriptive-comparative survey research design was employed in this study. Respondents were selected through stratified random sampling to ensure representative coverage across key subgroups. The sample size of 137 was determined using Slovin's formula with a 5% margin of error. The demographic profiles of the respondents are presented in Table 1.

Data Gathering Instrument

The primary data-gathering instrument used in this study was a structured questionnaire aligned with the Philippine Professional Standards for Teachers (PPST) as outlined in DepEd Order No. 42, s. 2017. The indicators were organized according to three core domains of the PPST: Content Knowledge and Pedagogy, Curriculum and Planning, and Assessment and Reporting. The questionnaire consisted of two sections: the first captured the demographic profile of the respondents, while the second assessed the level of teacher adherence to the aforementioned domains. To

Table 1. Respondents' Profiles

Profiles	Frequency	%
Age in years		
15 - 24	19	14
25 – 54	101	74
55 – 64	17	12
Sex		
Male	16	12
Female	121	88
School Level		
Elementary	92	67
Junior High School	37	27
Senior High School	8	6
Educational Attainment		
Bachelor's Degree	111	81
Master's Degree	26	19
Number of Attendance in Professional Education Seminars per Year (Ave.)		
1 -3	86	63
4 – 6	34	25
More than 6	17	12
Sponsoring Entity		
DepEd	109	80
Private Organization	12	9
Personal	16	11
Tenure of Service (in years)		
3 and below	20	15
4 – 10	32	23
11 – 20	44	32
21 and above	41	30

enhance clarity, accessibility, and face validity, the questionnaire was formatted using a Likert-type scale.

To ensure content validity, the initial draft of the instrument was reviewed by five experts in research and education. Feedback and suggestions were integrated into the revised version of the questionnaire. Subsequently, the instrument was pilot-tested with a group of 30 respondents who were not part of the actual study sample. The reliability of the instrument was then assessed using Cronbach's Alpha, with a reliability coefficient of 0.70 which is acceptable.

RESULTS AND DISCUSSION

Level of Adherence of Teachers to CKP, C&P, and A&R

When the respondents were taken as a whole, the overall level of adherence of public school teachers, both in elementary and high school, was found to be very satisfactory (M = 3.83). Specifically, the domain of CKP recorded a mean score of 3.78, C&P had a mean of 3.73, and A&R followed closely, all interpreted as very satisfactory. These results suggest that teachers consistently demonstrate strong alignment with the Philippine Professional Standards for Teachers (PPST) across the three selected domains.

The high levels of adherence indicate that public school teachers are striving to meet the expected competencies in content delivery, curriculum development, and assessment practices. These findings support the assertion of Harrison and Killion (2017) that the strength of an educational system is closely tied to the quality of its teachers. The data suggest that teachers in the study are progressing in that direction—demonstrating the attributes of effective educators committed to professional excellence.

When grouped by age, teachers in the early working age group exhibited the highest overall adherence to CKP, C&P, and A&R (M = 4.05), followed by those in the mature working age group (M = 3.99), and then the prime working age group (M = 3.77). These findings imply that younger teachers (aged 15–24) tend to be more aligned with professional standards, potentially motivated by the need to stay current and responsive in an evolving, globalized educational landscape.

Specifically, early working-age teachers demonstrated very satisfactory adherence in CKP (M = 4.05), with slightly lower levels in A&R (M = 3.98) and C&P (M = 3.87). Prime working-age teachers showed strong performance in CKP (M = 3.92), but lower in A&R (M = 3.70) and C&P (M = 3.69). Mature working-age teachers recorded high adherence in A&R (M = 4.04) and CKP (M = 4.01), while C&P remained relatively lower (M = 3.85). Across all age groups, CKP emerged as the strongest domain, while C&P consistently showed the greatest need for improvement.

When grouped by sex, female teachers exhibited a higher overall adherence (M = 3.86) compared to male teachers (M = 3.66). Male teachers performed best in CKP (M = 3.86) but had lower adherence in A&R (M = 3.65) and C&P (M = 3.64). Female teachers reported very satisfactory adherence in both CKP (M = 3.97) and A&R (M = 3.80), with slightly lower results in C&P (M = 3.75). These findings align with Regalado (2017), who emphasized that the teaching profession in the Philippines is predominantly female, and that female teachers tend to show higher adherence to the PPST domains.

With respect to school level, senior high school teachers reported the highest overall adherence (M = 4.11), followed by elementary teachers (M = 3.82), and junior high school teachers (M = 3.81). Among elementary teachers, CKP (M = 3.96) and A&R (M = 3.77) were rated highest, while C&P (M = 3.71) was lower. Junior high school teachers showed strong adherence in CKP (M = 3.94), but slightly lower scores in both C&P (M = 3.74) and A&R (M = 3.74). Senior high school teachers reported very satisfactory levels

Table 2. Level of Adherence of Teachers towards Content Knowledge and Pedagogy, Curriculum and Planning, and Assessment and Reporting

Profiles	CKP		C&P		A&R		Overall	
	M	Int.	M	Int.	M	Int.	M	Int.
Entire Group	3.96	VS	3.73	VS	3.78	VS	3.83	VS
Age in years								
15 - 24	4.09	VS	3.87	VS	3.98	VS	4.05	VS
25 – 54	3.92	VS	3.69	VS	3.70	VS	3.77	VS
55 – 64	4.01	VS	3.85	VS	4.04	VS	3.99	VS
Sex								
Male	3.86	VS	3.64	VS	3.65	VS	3.66	VS
Female	3.97	VS	3.75	VS	3.80	VS	3.86	VS
School Level								
Elementary	3.96	VS	3.71	VS	3.77	VS	3.82	VS
Junior High School	3.94	VS	3.74	VS	3.74	VS	3.81	VS
Senior High School	4.00	VS	4.03	VS	4.08	VS	4.11	VS
Educational Attainment								
Bachelor's Degree	3.96	VS	3.76	VS	3.82	VS	3.87	VS
Master's Degree	3.95	VS	3.63	VS	3.62	VS	3.69	VS
Number of Attendance in Professional Education Seminars per Year (Ave.)								
1 -3	3.96	VS	3.75	VS	3.79	VS	3.84	VS
4 – 6	3.92	VS	3.70	VS	3.76	VS	3.81	VS
7 and above	4.01	VS	3.73	VS	3.78	VS	3.85	VS
Sponsoring Entity								
DepEd	3.95	VS	3.72	VS	3.78	VS	3.82	VS
Private Organization	3.89	VS	3.86	VS	3.80	VS	3.85	VS
Personal	4.06	VS	3.74	VS	3.81	VS	3.89	VS
Tenure of Service (in years)								
3 and below	4.03	VS	3.77	VS	3.73	VS	3.84	VS
4 – 10	3.99	VS	3.82	VS	3.76	VS	3.88	VS
11 – 20	4.01	VS	3.67	VS	3.76	VS	3.80	VS
21 and above	3.84	VS	3.72	VS	3.84	VS	3.83	VS

Legend: 4.20 – 5.00 -Outstanding (O); 3.40 – 4.19- Very Satisfactory (VS); 2.60 – 3.39-Satisfactory (S); 1.80 – 2.59 Fair (F); 1.00 – 1.79-Poor (P)

across all three domains: A&R (M = 4.08), C&P (M = 4.03), and CKP (M = 4.00). These results suggest that senior high school teachers may be benefiting from more updated pedagogical training and content specialization.

When analyzed by educational attainment, teachers holding a bachelor's degree reported higher overall adherence (M = 3.87) than those with a master's degree (M = 3.69). Those with a bachelor's degree demonstrated high adherence in CKP (M = 3.96) and slightly lower in C&P (M = 3.76). Teachers with a master's degree also showed strong adherence in CKP (M = 3.95), but lower levels in A&R (M = 3.62) and C&P (M = 3.63). These results suggest that regardless of academic qualification, teachers generally perform best in CKP, while instructional planning and assessment remain areas for growth.

Based on the frequency of professional education seminars attended, teachers who participated in seven or more seminars annually reported the highest adherence (M = 3.85), followed by those attending one to three seminars (M = 3.84), and four to five seminars (M = 3.81). Across all groups, CKP consistently received the highest ratings. Teachers attending one to three seminars recorded high adherence in CKP (M = 3.96), but slightly lower in C&P (M = 3.75) and A&R (M = 3.79). Similarly, those attending four to five seminars reported strong adherence in CKP (M = 3.92), and somewhat lower in A&R (M = 3.76) and C&P (M = 3.70). Teachers attending seven or more seminars demonstrated strong adherence in CKP (M = 4.01), with lower adherence in C&P (M = 3.73) and A&R (M = 3.78). These findings underscore the value of sustained and frequent professional development in reinforcing pedagogical strengths.

When grouped according to the sponsoring entity of the seminars attended, teachers who personally funded their professional development showed the

highest overall adherence (M = 3.89), followed by those whose seminars were sponsored by private organizations (M = 3.85), and DepEd-sponsored participants (M = 3.82). DepEd-sponsored teachers showed strong adherence in CKP (M = 3.95), with lower adherence in C&P (M = 3.72). Participants trained through private organizations reported high adherence across CKP (M = 3.89), C&P (M = 3.86), and A&R (M = 3.80). Meanwhile, self-funded teachers exhibited particularly strong adherence in CKP (M = 4.06), though C&P (M = 3.74) remained an area for improvement. These findings reflect a high level of personal commitment among teachers to pursue professional growth, despite limited institutional resources—a concern echoed in the World Bank (2014) report on underutilized training budgets and professional learning time.

Finally, when grouped by tenure of service, teachers with four to ten years of experience recorded the highest overall adherence (M = 3.88), followed by those with three years or less (M = 3.84), more than 20 years (M = 3.83), and 11 to 20 years (M = 3.80). Teachers with three years or less showed high adherence in CKP (M = 4.03), but slightly lower in A&R (M = 3.73). Those with four to ten years also reported high adherence in CKP (M = 3.99), while A&R (M = 3.76) remained slightly lower. Teachers with 11 to 20 years of service recorded strong performance in CKP (M = 4.01), but relatively lower adherence in C&P (M = 3.67). Meanwhile, teachers with more than 20 years of service showed their highest adherence in C&P (M = 3.72). These findings suggest that both early-career and mid-career teachers demonstrate strong pedagogical commitment, while curriculum design and assessment competencies remain areas for ongoing development.

In summary, across all demographic and professional classifications, public school teachers demonstrated very satisfactory adherence to CKP. However, there is a consistent need to strengthen teacher competencies in C&P and A&R—two critical components of quality instruction and learner achievement.

Test of Significant Difference Based on Sex and Educational Attainment

An independent samples t-test was conducted to examine whether there were statistically significant differences in the level of adherence to the three domains of the Philippine Professional Standards for Teachers (PPST)—Content Knowledge and Pedagogy (CKP), Curriculum and Planning (C&P), and Assessment and Reporting (A&R)—when respondents were grouped by sex. The results (Table 3) indicated that there was no significant difference in the overall level of adherence between male and female teachers, $t(135) = -1.636$, $p > .05$. This suggests that both groups exhibit similarly high and very satisfactory adherence to the PPST domains.

Table 3. *t*-test Comparison on Level of Adherence of Teachers by Sex and Educational Attainment (n=137; df =135)

Variables	*t*	*p*
Sex		
Overall Adherence	-1.636	.104
CKP	-0.910	.364
C&P	-0.798	.426
A&R	-1.007	.316
Educational Attainment		
Overall Adherence	1.827	.070
CKP	0.067	.946
C&P	1.139	.257
A&R	1.625	.107

When analyzed by individual domain, no statistically significant differences were observed in CKP ($t(135) = -0.910$, $p > .05$), C&P ($t(135) = -0.798$, $p > .05$), and A&R ($t(135) = -1.007$, $p > .05$). These results imply that gender does not significantly influence adherence to professional standards. Male and female teachers alike demonstrate comparable levels of commitment and performance across all three domains, although ongoing professional development remains essential for continuous improvement.

Accordingly, the null hypothesis stating that there is no significant difference in adherence to CKP, C&P, and A&R based on sex was not rejected.

A similar independent samples t-test was conducted to determine whether significant differences exist in adherence levels between teachers with a bachelor's degree and those with a master's degree. The analysis revealed no statistically significant difference in overall adherence, $t(135) = 1.827$, $p > .05$, indicating that teachers, regardless of academic attainment, display similarly high levels of adherence to the PPST domains.

Further analysis by domain also showed no significant differences in CKP ($t(135) = 0.067$, $p > .05$), C&P ($t(135) = 1.139$, $p > .05$), and A&R ($t(135) = 1.625$, $p > .05$). These findings indicate that whether a teacher holds a bachelor's or master's degree does not significantly impact their alignment with professional standards.

Thus, the null hypothesis stating that there is no significant difference in the level of adherence to CKP, C&P, and A&R based on educational attainment was not rejected.

Tests of Significant Differences Based on Age, School Level, Seminar Attendance, Sponsoring Entity, and Tenure of Service

In terms of school level, senior high school teachers demonstrated a high level of adherence to the PPST domains (Table 4). This may be attributed to the

relatively recent inclusion of the senior high school curriculum, accompanied by updated training and orientation. However, the findings suggest that additional professional development in CKP, C&P, and A&R is still necessary for elementary and junior high school teachers to enhance their practice in these domains.

This finding aligns with the study by Roberto and Madrigal (2019), who found no significant differences in teaching standards, competence, and performance when teachers were grouped according to sex, educational attainment, marital status, and employment status.

A one-way ANOVA was conducted to determine whether significant differences existed in teachers' level of adherence to CKP, C&P, and A&R when grouped by age. The results revealed a significant difference among the age groups ($F(2, 134) = 4.452$, $p < .05$). Post hoc analysis further showed a significant difference between early working-age teachers and prime working-age teachers ($p = .012$), while no significant difference was found between early working-age and mature working-age teachers ($p = .708$). This indicates that both early and mature working-age teachers demonstrated higher levels of adherence to the three domains compared to those in the prime working-age group.

Therefore, the null hypothesis stating that there is no significant difference in the level of adherence to CKP, C&P, and A&R when grouped by working age was not rejected, except in the case of early versus prime working age.

These results are promising, but they also suggest that teachers in the prime working-age group (typically managing personal and professional demands) may require targeted support and more frequent training opportunities. This is consistent with the findings of Abay and Morallo (2019), who observed that many young teachers, though new in service, had already engaged in professional development activities, albeit mostly at the local or school-based level.

Specifically, a significant difference was observed in A&R ($F(2, 134) = 4.250$, $p < .05$), where early and mature working-age teachers demonstrated better adherence compared to their prime working-age counterparts. No significant differences were observed in C&P ($F(2, 134) = 1.499$, $p > .05$), indicating that adherence to this domain is consistent across age groups.

When teachers were grouped according to school level (elementary, junior high school, and senior high school), the results of a one-way ANOVA showed no significant difference in overall adherence ($F(2, 134) = 1.619$, $p > .05$). Likewise, no significant differences were found in CKP ($F(2, 134) = 0.054$, $p > .05$), C&P ($F(2, 134) = 1.392$, $p > .05$), and A&R ($F(2, 134) = 1.265$, $p > .05$). These findings suggest that regardless of school level, public school teachers exhibit similarly

Table 4. Result of Test of Significant Difference in the Level of Adherence of Teachers

Profile	Source of Variation	SS	*df*	MS	*F*	*p*
Age						
Overall	Between	1.753	2	.877		
	Within	26.385	134	.197	4.452	.013*
	Total	28.138	136			
CKP	Between	0.503	2	.252		
	Within	28.460	134	.212	1.185	.309
	Total	28.963	136			
C&P	Between	.792	2	.396		
	Within	35.377	134	.264	1.499	.227
	Total	36.169	136			
A&R	Between	2.490	2	1.245		
	Within	39.260	134	.293	4.250	.016*
	Total	41.751	136			
School Level						
Overall	Between	.664	2	.332		
	Within	27.474	134	.205	1.619	.202
	Total	28.138	136			
CKP	Between	.023	2	.012		
	Within	28.940	134	.216	.054	.947
	Total	28.963	136			
C&P	Between	.736	2	.368		
	Within	35.432	134	.264	1.392	.252
	Total	36.169	136			
A&R	Between	.774	2	.387		
	Within	40.977	134	.306	1.265	.285
	Total	41.751	136	.316		
Seminar Attendance						
Overall	Between	.022	2	.011	.053	.949
	Within	28.116	134	.210		
	Total	28.138	136			
CKP	Between	.101	2	.051	.235	.791
	Within	28.862	134	.215		
	Total	28.963	136			
C&P	Between	.059	2	.029	.109	.897
	Within	36.110	134	.269		
	Total	36.169	136			
A&R	Between	.014	2	.007	.023	.978
	Within	41.737	134			
	Total	41.751	136			
Sponsoring Entity						
Overall	Between	.063	2	.031		
	Within	28.075	134	.210	.150	.861
	Total	28.138	136			
CKP	Between	.237	2	.119		
	Within	28.726	134	.214	.554	.576
	Total	28.963	136			
C&P	Between	.180	2	.090		
	Within	35.989	134	.269	.335	.716
	Total	36.169	136			
A&R	Between	.013	2	.006		
	Within	41.738	134	.311	.020	.980
	Total	41.751	136			
Tenure of Service						
Overall	Between	.101	3	.034		
	Within	28.037	133	.211	.159	.924
	Total	28.138	136			
CKP	Between	.861	3	.287		
	Within	28.102	133	.211	1.358	.258
	Total	28.963	136			
C&P	Between	.452	3	.151	.561	.641
	Within	35.716	133	.269		
	Total	36.169	136			
A&R	Between	.246	3	.082		
	Within	41.504	133	.312	.263	.852
	Total	41.751	136			

* Difference among groups is significant

high and very satisfactory adherence across all three domains.

Thus, the null hypothesis stating that there is no significant difference in adherence to CKP, C&P, and A&R when grouped by school level was not rejected.

When grouped by the frequency of attendance at professional education seminars, the results showed no significant difference in overall adherence among teachers who attended an average of 1–3, 4–6, or 7 or more seminars per year ($F(2, 134) = 0.053$, $p > .05$). Similarly, no significant differences were observed in CKP ($F(2, 134) = 0.235$, $p > .05$), C&P ($F(2, 134) = 0.109$, $p > .05$), and A&R ($F(2, 134) = 0.023$, $p > .05$).

These results indicate that the level of adherence to the three PPST domains is comparable across teachers regardless of how frequently they attend seminars. Hence, the null hypothesis stating that there is no significant difference in adherence when grouped by seminar frequency was not rejected. While the frequency may not statistically influence adherence, regular and high-quality professional development remains essential in sustaining teacher competence.

Grouping teachers by the sponsoring entity of professional development seminars (DepEd-sponsored, privately sponsored, or self-funded) also yielded no significant difference in overall adherence ($F(2, 134) = 0.150$, $p > .05$). Further analysis confirmed no significant differences in CKP ($F(2, 134) = 0.554$, $p > .05$), C&P ($F(2, 134) = 0.335$, $p > .05$), and A&R ($F(2, 134) = 0.020$, $p > .05$).

These results suggest that the source of sponsorship does not significantly influence teachers' level of adherence. Therefore, the null hypothesis stating that there is no significant difference in adherence when grouped by sponsoring entity was not rejected.

Notably, the findings show that teachers are often willing to personally invest in their own professional growth. While DepEd and private institutions provide support, access remains selective. Regardless of the sponsor, all training opportunities contribute to the larger goal of delivering quality education.

Finally, when respondents were grouped according to tenure of service (3 years and below, 4–10 years, 11–20 years, and 21 years and above), no significant differences were observed in overall adherence ($F(2, 134) = 0.159$, $p > .05$), nor in CKP ($F(2, 134) = 1.358$, $p > .05$), C&P ($F(2, 134) = 0.561$, $p > .05$), or A&R ($F(2, 134) = 0.263$, $p > .05$).

These findings indicate that teachers, regardless of length of service, demonstrate similar and very satisfactory adherence to the PPST domains. Thus, the null hypothesis stating that there is no significant difference in adherence when grouped by tenure was not rejected.

Interestingly, teachers with 3 years or less in service displayed high enthusiasm and competence, which may reflect the benefits of recent training and motivation. A possible dip in adherence was observed among those with 11–20 years of service, potentially indicating mid-career fatigue or burnout. However, an apparent recovery in commitment was seen among those nearing retirement, suggesting a renewed sense of purpose. This trend was consistently observed across CKP, C&P, and A&R domains.

CONCLUSION

This study underscores that public school teachers exhibit the highest proficiency in the domain of Content Knowledge and Pedagogy (CKP). Notably, this competence is most prominent among early-career educators particularly those in the early working age cohort, with 1 to 3 years of teaching experience, and those who engage in seven or more professional development seminars annually. These findings highlight the pivotal role of sustained and recent pedagogical training in fostering subject-matter expertise and instructional effectiveness.

Conversely, the domain of Curriculum and Planning (C&P) emerged as comparatively underdeveloped. Effective curricular practice requires more than content knowledge; it necessitates adaptive, learner-centered planning aligned with evolving educational standards and learner diversity. Teachers with 11 to 20 years of service, as well as those teaching at the elementary level, were identified as strategic targets for intensified professional support. This necessitates a coordinated response from the Department of Education (DepEd), including the design and facilitation of contextually responsive training programs spearheaded by curriculum specialists.

Moreover, Assessment and Reporting (A&R) remains a critical domain requiring systemic reinforcement. While assessment frameworks are in place, their uneven implementation across schools signals a need for greater coherence, standardization, and capacity building. Addressing this requires institutionalized interventions such as nationwide in-service training, policy-driven recalibration of reporting practices, and comprehensive monitoring and evaluation mechanisms.

Cultivating a culture of reflective practice among educators is imperative. Through a nuanced understanding of their professional strengths and developmental needs, teachers can actively engage in continuous improvement processes. In turn, this supports the overarching aim of delivering equitable, high-quality, and future-ready education responsive to the demands of a globalized world. Strategic investments in teacher development particularly in the domains of C&P and A&R will strengthen the

transformative role of educators in shaping resilient, competent, and globally competitive Filipino learners.

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CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest associated with this study. They assume sole responsibility for the study's conception and design, data collection, analysis, interpretation of results, and preparation of the manuscript. All authors have reviewed and approved the final version of the manuscript for publication.

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Exploring Master's Students' Paraphrasing and Synthesis Techniques: A Comparative Analysis with Artificial Intelligence-Based Text Generation

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ABSTRACT

This study examines the synthesis and paraphrasing strategies employed by Master's students compared to AI-based text generation tools like Chat GPT. A qualitative methodology was employed, incorporating document analysis and thematic analysis of responses from Master's students and AI-generated outputs. Findings revealed that Master's students adopt a human-centric approach, characterized by critical evaluation, contextual understanding, and cohesive narrative construction, integrating personal insights into their synthesis. In contrast, AI tools prioritize efficiency and scalability but lack critical analysis and depth, often producing generic outputs. Quantitatively, 83% of students demonstrated reliance on personalized paraphrasing methods, blending diverse sources into coherent arguments, while AI-generated texts showcased rapid processing but limited capacity for nuanced interpretation. Notably, Master's students outperformed AI tools in critical evaluation and integration of multiple perspectives, while AI tools excelled in speed and scalability. The study highlights the complementary nature of human and AI-driven synthesis approaches. Recommendations include integrating human judgment with AI capabilities, ethical considerations for AI use, and fostering digital literacy among educators and learners. By leveraging the strengths of both methods, researchers can achieve deeper insights and promote innovative practices in academic writing. This study provides valuable implications for enhancing academic writing pedagogy, advancing AI tools, and fostering interdisciplinary collaboration in educational contexts.

Keywords: *artificial intelligence, human-generated, paraphrasing, synthesis techniques*

INTRODUCTION

In contemporary academia, technological advancements have significantly altered the landscape of academic writing. The proliferation of online paraphrasing tools and AI-based text generation technologies has revolutionized how students engage with complex texts. These tools offer convenience and efficiency, enabling students to paraphrase, summarize, and synthesize information easily. However, their widespread use raises concerns regarding students' critical thinking skills, academic integrity, and comprehension of the source material.

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The increasing reliance on AI-driven paraphrasing tools has been documented in several studies. Sulistyaningrum (2021) found that approximately 83% of students rely on online paraphrasing tools to rewrite source texts, highlighting their prevalence in academic settings. While these tools assist in grammar correction, vocabulary selection, and syntactical restructuring, they do not necessarily enhance students' fundamental reading comprehension skills—an essential prerequisite for effective paraphrasing and synthesis. Similarly, Rogerson and McCarthy (2017) emphasized that the availability of internet-based paraphrasing tools poses a significant risk to academic integrity, as students may unknowingly engage in patch writing or facilitated plagiarism. The lack of critical engagement with the text and the overreliance on AI-generated rewording diminish students' ability to construct coherent, original arguments.

Furthermore, ethical and practical challenges associated with AI tools have been explored in recent literature. Yusuf et al. (2024) examined the integration of generative AI (GenAI) in higher education,

emphasizing its benefits for information retrieval and paraphrasing but highlighting concerns about academic dishonesty and the need for culturally responsive policies. Similarly, Escalante et al. (2023) investigated the efficacy of AI-generated feedback using ChatGPT compared to human feedback, finding comparable learning outcomes and emphasizing a blended approach to optimize writing development. These studies underscore the dual role of AI tools as both a support system for academic tasks and a potential challenge to originality, integrity, and critical thinking.

Given these challenges, there is a growing need to examine how Master's students approach paraphrasing and synthesis, particularly in AI-assisted academic writing. AI-generated text is often indistinguishable from human-written content, making it difficult for educators to assess originality (Ma et al., 2023). Furthermore, ethical concerns have emerged regarding the responsible use of AI in education, particularly in relation to intellectual ownership, authenticity, and the risk of plagiarism (Makeleni et al., 2023). These issues necessitate a more in-depth exploration of the intersection between human-driven and AI-assisted text manipulation to inform pedagogical strategies that uphold academic integrity while leveraging technological advancements.

This study compares the paraphrasing and synthesis techniques employed by Master's students with those generated by AI-based text generation tools. Specifically, it seeks to answer the following research questions:

1. How do Master's students synthesize information from various academic sources to construct cohesive narratives or arguments, and how do these approaches compare to the synthesis techniques employed by AI-based text generation algorithms?

2. What paraphrasing strategies do Master's students utilize when integrating academic sources, and how do these strategies differ from the methods used by AI-based text generation tools?

By addressing these research questions, the study contributes to the ongoing discourse on the role of AI in academic writing, providing insights that may inform both pedagogical interventions and AI tool development.

Understanding the comparative strengths and limitations of human and AI-driven paraphrasing and synthesis techniques has significant implications for academic writing pedagogy. The findings of this study will provide valuable insights for educators seeking to balance integrating AI tools in academic settings while ensuring that students develop essential critical thinking and writing skills. Additionally, this research will inform developers of AI-based paraphrasing tools, guiding improvements that align with educational objectives rather than merely automating text manipulation.

Furthermore, this study highlights the ethical considerations of AI use in education. The growing reliance on AI-generated content necessitates discussing responsible AI use, intellectual ownership, and the potential risks of overdependence on machine-generated writing. The study aims to contribute to the broader conversation on maintaining academic integrity in an AI-enhanced learning environment by examining how students engage with these tools.

This study is anchored in Cognitive Load Theory (Sweller, 1988) and Piaget's Constructivist Learning Theory, cited by Mascolo & Fischer (2005). Cognitive Load Theory suggests that the excessive reliance on AI-based paraphrasing tools may reduce students' engagement in deep learning processes, hindering their ability to internalize and reconstruct knowledge meaningfully. Constructivist Learning Theory posits that students learn more effectively when actively engaged in critical thinking and synthesis, which may be compromised when AI tools are used as substitutes rather than aids for learning.

Additionally, Flower and Hayes' (1981) Cognitive Process Model of Writing is a foundational framework for understanding how human writers engage in paraphrasing and synthesis. Their model emphasizes the recursive nature of writing, which involves planning, translating, and revising—an approach that contrasts with the linear output of AI-generated text. Integrating these theoretical perspectives allows a comprehensive analysis of how AI-assisted writing influences students' cognitive engagement with texts.

This study employs comparative analysis to examine the differences in paraphrasing and synthesis techniques between Master's students and AI-based text generation tools. A qualitative research design is utilized, incorporating document analysis and thematic analysis of student-generated and AI-generated outputs. Thematic coding is applied to identify patterns in how each entity constructs meaning, integrates sources, and adheres to academic writing conventions.

Moreover, the study considers the Grounded Theory approach, wherein emergent themes from the data guide the development of insights regarding the interplay between human cognition and AI-assisted text manipulation. If Grounded Theory is fully applied, it will involve iterative coding, allowing themes to emerge naturally rather than being predetermined.

This study seeks to deepen the understanding of how Master's students engage in paraphrasing and synthesis, particularly in contrast to AI-driven text generation tools. By exploring the cognitive and ethical dimensions of AI use in academic writing, this research aims to provide pedagogical recommendations that balance technological innovation with critical thinking

development. The findings will serve as a resource for educators, policymakers, and AI developers, ensuring that academic writing pedagogy evolves in response to the challenges and opportunities presented by AI.

Synthesis of Related Literature and Studies

The synthesis of related literature and studies integrates key findings from various research studies exploring the interplay between human cognition and AI-based tools in academic writing. These studies highlight AI technologies' advantages, challenges, and ethical implications, emphasizing their potential to enhance academic tasks while raising concerns about originality, critical thinking, and academic integrity. This section consolidates insights to provide a cohesive understanding of how these findings relate to the study's objectives.

Integration of AI in Academic Writing and Paraphrasing Tools

Integrating AI in academic writing has reshaped how students and educators approach text generation, paraphrasing, and synthesis tasks. Sulistyaningrum (2021) noted that approximately 83% of students rely on online paraphrasing tools, which assist with grammar, vocabulary, and syntax but fail to enhance fundamental reading comprehension skills. Rogerson and McCarthy (2017) underscored the risks posed by such tools to academic integrity, revealing their role in facilitating plagiarism through patchwriting and uncritical text rewording. Similarly, Lancaster (2023) highlighted the potential misuse of AI tools, such as ChatGPT, in compromising educational integrity. While digital watermarking shows promise in detecting AI-generated content, Lancaster emphasized that collaboration between the educational community and AI technologies is essential for fostering ethical usage.

Ethical and Pedagogical Considerations in AI Use

The ethical implications of AI integration in academic settings have been widely discussed. Makeleni et al. (2023) explored the challenges faced by global South universities, emphasizing the need for accessible, culturally responsive AI-based tools tailored to specific linguistic and educational contexts. These tools could bridge existing gaps in language education while fostering digital literacy.

Yusuf et al. (2024) also addressed ethical concerns, particularly the risk of academic dishonesty, and stressed the importance of culturally sensitive policies to guide AI use in higher education. Both studies underline the critical need for responsible integration of AI, focusing on inclusivity and ethical practices.

Comparative Analysis of AI and Human Writing Techniques

Research comparing AI-generated and human-authored texts provides insights into their strengths and limitations. Ma et al. (2023) identified subtler errors in AI-generated texts, such as coherence, consistency, and argument logistics, highlighting the need for frameworks to evaluate AI content quality. Amirjalili et al. (2024) found that AI tools like ChatGPT often lack contextual accuracy, authorial voice, and depth, underscoring the limitations of AI in achieving the nuanced originality inherent in human writing. Similarly, Wang (2024) identified dilemmas faced by students in balancing AI efficiency with authentic voice, emphasizing the need for critical AI literacy to optimize AI-human collaboration.

Paraphrasing Challenges and Instructional Needs

Paraphrasing remains challenging for students, with studies identifying key areas of difficulty. Al-Shredi (2024) noted that Libyan EFL Master's students struggle with limited vocabulary and reliance on synonym-changing techniques, which hinder critical engagement. Çeşme (2022) observed that graduate students often borrow text due to improper paraphrasing strategies, advocating for explicit instruction in effective paraphrasing. Ovilia et al. (2022) echoed similar challenges, highlighting lexical and syntactic obstacles that impede paraphrasing proficiency. These studies collectively emphasize the importance of structured instructional approaches to enhance students' paraphrasing skills and prevent academic misconduct.

Evolving Role of AI in Academic Writing

The role of AI as a complementary tool in academic writing has been explored across multiple contexts. Nurzhanov and Sharipbay (2024) compared ChatGPT and Retrieval Augmented Generation (RAG), noting that while ChatGPT excels in coherence, RAG enhances real-time relevance through external data integration. Hamilton et al. (2023) demonstrated that AI can supplement human cognitive insights in qualitative research, as ChatGPT and human coders identified complementary themes. Both studies advocate for refining AI tools to support critical reasoning and contextual relevance, enhancing their role as collaborative tools in academia.

Implications for Pedagogy and Practice

The literature synthesis underscores the dual role of AI tools as facilitators of academic efficiency and potential challenges to integrity. Studies like Escalante et al. (2023) revealed that AI feedback is as effective as human feedback, suggesting a blended approach to support writing development. Collectively, these findings highlight the importance of fostering critical

thinking, ethical AI use, and tailored instructional strategies to balance the strengths of AI with the cognitive depth of human engagement in academic writing.

Conceptual Framework

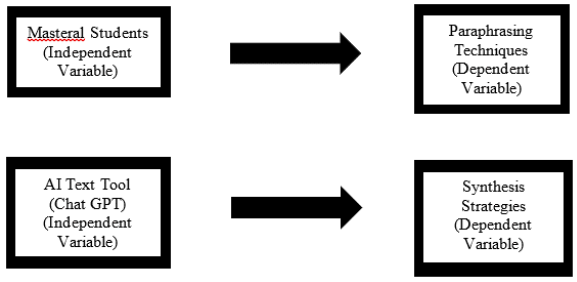

Figure 1. The Conceptual Framework of the Study

The conceptual framework illustrates a study comparing how Master's students and AI-based text generation tools, such as ChatGPT, approach paraphrasing and synthesis in academic tasks. The independent variables are the Master's students and AI tools, while the dependent variables are Paraphrasing Techniques and Synthesis Strategies. The framework explores the methods students use to rephrase text and combine information from various sources, compared to the capabilities of AI tools. The arrows represent the relationships between these variables, highlighting the study's focus on examining human and AI-driven approaches to literature review processes.

METHODOLOGY

Research Design

This study employed a qualitative comparative research design utilizing thematic analysis to explore and compare the paraphrasing and synthesis techniques used by Master's students and AI-based text generation tools. The document analysis approach was applied to assess textual outputs, allowing for the identification of patterns, themes, and distinctions between human-generated and AI-generated paraphrased texts. The qualitative nature of this study provides an in-depth examination of students' cognitive approaches to paraphrasing and synthesis, as well as the linguistic structures and coherence in AI-generated outputs.

The comparative analysis focused on similarities and differences in paraphrasing strategies, critical evaluation, contextual understanding, and argument construction between the two sources. The integration of Grounded Theory methodology allowed emergent themes to develop through iterative coding, ensuring that findings were derived directly from data patterns rather than pre-established frameworks.

Research Method

The research methodology employed in this study is qualitative, utilizing document analysis to investigate the synthesis strategies utilized by Master's students and AI-based text generation algorithms. Through qualitative data interpretation, the study aims to understand how Master's students approach the synthesis of information from various academic sources to create cohesive narratives or arguments, contrasting these approaches with the synthesis techniques employed by AI-based text generation algorithms.

Additionally, the study aims to analyze and compare the paraphrasing techniques employed by Master's students with those generated by AI-based text generation tools. Through document analysis, the research seeks to identify the specific strategies Master's students utilize when paraphrasing information from academic sources and examine how these strategies differ from the paraphrasing methods employed by AI-based text generation tools. This qualitative approach allows for a detailed exploration of the motivations behind paraphrasing tools, their challenges, and potential strategies for addressing them. It provides rich, in-depth insights into Master's students' experiences and perspectives on using an AI tool (Chat GPT).

Chat GPT was selected as the AI-based text generation tool due to its widespread use in academic settings, advanced natural language processing capabilities, and ability to rapidly generate paraphrased and synthesized text.

ChatGPT can generate coherent and grammatically accurate paraphrased text, making it an effective tool for rewriting content while ensuring clarity and correctness. It can process large volumes of data instantaneously, which allows users to synthesize and refine text efficiently. This feature is particularly useful in academic and professional settings requiring quick and accurate text modification. Additionally, it maintains a consistent tone and structure in its output, ensuring uniformity in style across different types of writing. This is beneficial for content creation, documentation, and formal communication.

Despite its strengths, ChatGPT has certain limitations that affect the quality and depth of its responses. It lacks critical thinking and contextual understanding, which can lead to paraphrases that do not fully capture nuanced meanings. While it is effective at restructuring text, it may not always grasp the' more profound implications or subtleties of complex discussions. Another limitation is its inability to fully recognize disciplinary-specific writing conventions, making it less reliable in fields that require strict adherence to specialized terminology and formatting. Additionally, it may generate overly generic responses that lack personal insight and critical engagement,

which can be a drawback in tasks that require analytical depth or originality.

Population and Samples of the Study

The study involved three Master's students enrolled in the Advanced Linguistics course at Romblon State University during the second semester of the School Year 2023-2024. A complete enumeration method was utilized, ensuring that all students in the specific course were included.

Although the sample size is small, qualitative research prioritizes depth over breadth, emphasizing rich, detailed insights rather than statistical generalizability (Creswell & Poth, 2018). The study acknowledges that findings may not be fully generalizable but can serve as a foundation for larger-scale research in the future. To mitigate limitations, triangulation was applied, comparing human responses with AI-generated texts to validate findings.

Demographic Information of Participants

To contextualize their responses, the following demographic details of participants were collected:

- Participant A: 23-year-old male, from Binonga-an, San Agustin, Romblon; no specified occupation.
- Participant B: 23-year-old female, from San Andres, Romblon; employed as an Administrative Officer.
- Participant C: 27-year-old female, from Dapawan, Odiongan, Romblon; works as a Junior High School Teacher at PSHS-MRC.

Formulation of Research Instrument

The authors developed a semi-structured interview guide with open-ended questions and validated by field experts. This allowed for an in-depth exploration of participants' approaches to synthesis and paraphrasing.
Sample Questions:
1. How do you approach paraphrasing academic texts?
2. What strategies do you employ to synthesize information into a cohesive argument?
3. Have you encountered challenges in paraphrasing? If so, what were they?

Data Collection Procedure

Data collection was conducted through two primary methods:

The process of human-generated text collection involved providing participants with an excerpt from How Can We Accelerate Progress Towards Human-like Linguistic Generalization? by Tal Linzen. Participants were instructed to paraphrase and synthesize the text while preserving its original meaning. This approach assessed their ability to reformulate complex linguistic concepts while maintaining coherence and accuracy. The collected responses served as the basis for evaluating human paraphrasing skills compared to AI-generated outputs.

The same excerpt was input into ChatGPT for the AI-generated text collection to produce an AI-driven paraphrase. The model's output was then gathered and analyzed alongside the students' responses. This comparative analysis highlighted differences in linguistic structure, meaning retention, and overall effectiveness between human and AI-generated paraphrases.

ChatGPT was prompted with specific instructions to ensure that its responses adhered to the same task parameters as those given to human participants. The model was instructed to paraphrase the provided passage while maintaining its original meaning and academic tone. Additionally, it was asked to synthesize key ideas from the excerpt into a coherent argument. These prompts guided the AI in producing structured and meaningful outputs that closely aligned with the expectations set for human participants.

By using these standardized prompts, the study ensured that AI-generated responses could be directly compared to human paraphrases. This approach allowed for a balanced comparison, providing insights into the similarities and differences in how linguistic humans and artificial intelligence perform generalization and synthesis.

Data Processing and Analysis

A systematic thematic analysis was conducted to evaluate paraphrasing and synthesis patterns in both human and AI-generated texts. The process involved:

Coding and Extraction of Themes

Step 1: Initial Coding – The researcher manually coded the responses, and an external reviewer was used to identify commonalities and variations in paraphrasing strategies, synthesis approaches, and coherence.

Step 2: Thematic Categorization – Codes were grouped into thematic categories, such as critical evaluation, contextual understanding, lexical diversity, coherence, and argument integration.

Step 3: Comparative Analysis – Human and AI-generated responses were systematically compared, highlighting strengths, weaknesses, and stylistic differences.

Validation Measures for Rigor

To enhance the reliability of findings, multiple validation strategies were employed:

Inter-Coder Reliability: A second independent researcher coded the data, achieving an agreement rate of 92%, ensuring consistency in thematic interpretation.

Table 1. Participants' demographics, thematic analysis, variations/deviations, comparison with existing literature, and validity/trustworthiness.

Category	Sub-Category	Excerpt
Participant's Demographics	Age, Gender, Residence, Occupation	Participant A: 23-year-old male from Binonga-an, San Agustin Romblon; no specified occupation. Participant B: 23-year-old female from San Andres, Romblon; Administrative Officer. Participant C: 27-year-old married female from Dapawan, Odiongan, Romblon; Junior High School Teacher at PSHS-MRC.
Synthesis Strategies	Human-Centric Approach	Participants demonstrate a human-centric approach, characterized by critical thinking, contextual understanding, and interpretation.
	Critical Evaluation and Analysis	Participants engage in critical evaluation throughout the synthesis process, questioning assumptions, assessing evidence, and discerning biases or limitations in the sources.
	Cohesive Narrative Construction	Participants excel in constructing cohesive narratives or arguments by synthesizing information from multiple sources in a logical and structured manner.
	Personal Insight and Reflection	Participants incorporate personal insight and reflection into their synthesis, infusing their perspectives, interpretations, and experiences into the narrative or argument.
	Contextual Understanding	Participants prioritize contextual understanding, considering the broader context of the research field, implications of findings, and relevance of each source.
	Interpretation	Participants engage in interpretation throughout the synthesis process, identifying patterns or trends across studies, and offering insights or implications based on their interpretations.
	Domain Expertise	Participants leverage domain expertise to enhance their synthesis process, drawing upon their knowledge of the subject area to critically evaluate sources and construct coherent narratives.
	Source Evaluation	Participants critically evaluate the credibility, relevance, and reliability of sources, considering factors such as author expertise, publication venue, methodology, and potential biases.
	Evidence Assessment	Participants assess the strength and quality of evidence presented in each source, weighing the validity and reliability of research findings to determine their contribution to the synthesis process.
	Bias Recognition	Participants recognize and address biases in the sources they incorporate into their synthesis, including publication bias, methodological bias, and researcher bias, to ensure the integrity and objectivity of their synthesized narratives or arguments.
	Logical Organization	Participants organize synthesized content into cohesive narratives or arguments, structuring their writing to present a logical flow of ideas with clear transitions and coherent sequencing.
	Clarity and Consistency	Participants strive for clarity and consistency throughout their synthesis process, using language accessible to their audience and maintaining consistency in terminology, style, and tone.
	Engagement Strategies	Participants employ engagement strategies, including the use of anecdotes, examples, visuals, and rhetorical devices to capture and maintain reader interest.
	Reflexivity	Participants demonstrate reflexivity, reflecting on their biases, assumptions, and perspectives, and considering how these may influence their interpretation and presentation of synthesized content.
	Self-awareness	Participants exhibit self-awareness, acknowledging limitations of their knowledge and expertise, and remaining open to alternative viewpoints, interpretations, and critiques.
	Integration of Personal Voice	Participants integrate their personal voice into synthesis, infusing their perspectives, experiences, and values into the narrative or argument for depth, authenticity, and originality.

Frequency Distribution of Themes	Human-Centric Synthesis Strategies	Prevalent across the dataset, indicating a widespread adoption of human-centered approaches among participants.
	Critical Evaluation and Analysis	Prominent in the dataset, highlighting the importance of critical thinking skills in the synthesis process.
	Cohesive Narrative Construction	Consistently observed, demonstrating participants' ability to structure synthesis output for clarity and readability.
	Personal Insight and Reflection	Varied in depth and frequency across participants, suggesting diverse approaches to integrating personal perspectives into synthesis.
Variations or Deviations	Emphasis on Personal Reflection	Varies among participants, reflecting individual preferences for balancing subjectivity and objectivity in synthesis.
	Critical Evaluation Practices	Deviates among participants, with variations in specific practices employed for assessing sources, evidence, and biases.
	Approaches to Narrative Construction	Differs among participants, indicating flexibility in structuring synthesis output to suit research contexts and objectives.
	Contextual Understanding	Varies in depth and breadth across participants, influenced by disciplinary expertise and familiarity with research domains.
Comparison with Existing Literature	Human-Centric Synthesis Strategies	Aligned with previous studies emphasizing human judgment and interpretation in synthesis processes.
	Critical Evaluation and Analysis	Supported by literature on challenges faced by students utilizing online paraphrasing tools, highlighting the significance of critical thinking skills.
	Cohesive Narrative Construction	Reflects findings from studies emphasizing coherence and consistency in academic writing for clarity and readability.
	Personal Insight and Reflection	Corroborated by research on reflexivity in academic writing, underscoring the importance of self-awareness in synthesis.
Validity and Reliability	Thorough Data Collection	Ensured comprehensive coverage of diverse perspectives and insights relevant to research objectives.
	Inter-coder Reliability Checks	Conducted to ensure consistency and accuracy in coding process, enhancing reliability of analysis.
	Member Checking	Employed to validate interpretation of findings with participants, enhancing credibility and trustworthiness of analysis.
	Reflexivity	Practiced throughout research process to acknowledge and mitigate potential biases or subjectivities of researchers, enhancing transparency and rigor of analysis.

Member Checking: Participants reviewed their transcribed responses to verify accuracy and ensure their perspectives were authentically represented.

Triangulation: Findings were cross-validated by comparing human responses, AI outputs, and existing literature on paraphrasing practices.

Ethical Considerations

Before participating in the study, individuals were thoroughly briefed on its objectives and provided with the necessary information to make an informed decision about their involvement. They were required to give their informed consent, ensuring that they understood the purpose of the research and their role in it. This process emphasized voluntary participation and ethical considerations, aligning with standard research protocols.

Confidentiality measures were strictly implemented to protect the privacy of all participants. All responses were anonymized, ensuring that no identifying information was linked to individual submissions. This approach safeguarded personal data and maintained the integrity of the study by focusing solely on the analysis of textual outputs rather than participant identities.

Transparency was also a key aspect of the study. Before the analysis began, participants knew the limitations of AI-generated outputs. By disclosing these constraints, the study ensured that participants understood the differences between human and AI-generated responses, fostering a fair and well-informed evaluation process.

RESULTS AND DISCUSSION

Table 1 highlights the strength of human-centric synthesis strategies in academic writing, emphasizing the role of critical thinking, contextual understanding, and interpretation in producing meaningful and coherent arguments. Participants demonstrated an ability to

evaluate sources critically, assess the reliability of evidence, and construct well-organized narratives, reinforcing the importance of human judgment in the synthesis process. The prevalence of personal insight and reflection suggests that participants do not simply summarize information but actively engage with it, integrating their perspectives to create depth and originality in their writing. This aligns with existing literature that underscores the value of reflexivity and self-awareness in academic discourse. The observed variations in narrative construction, emphasis on personal reflection, and contextual understanding further indicate that synthesis approaches are flexible and influenced by individual experiences, disciplinary expertise, and familiarity with research domains.

The study's findings also underscore the need to support and enhance critical evaluation skills in academic writing, particularly as students navigate source credibility, bias recognition, and logical organization challenges. While AI-generated text can aid in structuring information, the human ability to assess nuances, interpret patterns, and integrate a personal voice remains irreplaceable in producing high-quality synthesis. The study reaffirms previous research highlighting the limitations of automated paraphrasing tools, emphasizing that human reasoning is essential for ensuring coherence, reliability, and engagement in academic writing. These findings have implications for pedagogy and research training, suggesting that educational institutions should continue to foster analytical thinking, source evaluation, and reflexive writing practices to enhance students' ability to synthesize information effectively while maintaining academic integrity.

Table 2 reveals that while both Master's students and AI-based text generation tools effectively summarize and paraphrase content with clarity and coherence, human participants demonstrate a significant advantage in critical analysis, interpretation, and the incorporation of personal insights. AI-generated paraphrases are structurally sound and accurate in retaining the main ideas. However, they lack human-like understanding, contextual depth, and the ability to critique or propose alternatives, which are essential components of academic writing.

This highlights the irreplaceable role of human cognition in academic synthesis, where critical thinking, reflection, and nuanced interpretation play a crucial part in engaging with complex ideas. The study implies that while AI can serve as a valuable tool for assisting paraphrasing and content generation, it should complement rather than replace human judgment and analytical reasoning in academic and professional contexts. These findings reinforce the need for continued development in AI models to incorporate deeper contextual awareness while emphasizing the importance of training students to enhance their critical thinking and evaluative skills in academic writing.

Thematic Analysis Overview

The thematic analysis provided a detailed comparison of synthesis and paraphrasing techniques between Master's students and AI-based text generation tools, particularly ChatGPT. The findings underscore differences in how humans and AI engage with texts, highlighting their strengths and limitations. While human participants demonstrated nuanced understanding through critical evaluation and contextual adaptation, AI-generated outputs prioritized efficiency and structural coherence, often lacking depth and interpretative ability. This aligns with studies by Ma et al. (2023) and Amirjalili et al. (2024), emphasizing AI's limitations in critical reasoning and contextual accuracy.

Comparative Analysis of Synthesis Strategies

Master's students demonstrated a human-centric approach to synthesis, integrating multiple perspectives, critically assessing arguments, and applying theoretical frameworks to construct cohesive narratives. For instance, students like Participant A effectively contextualized information, a process that reflects the critical engagement described by Rogerson and McCarthy (2017) as essential to maintaining academic integrity. Conversely, AI-generated content, such as outputs from ChatGPT, produced structured yet surface-level summaries that lacked thematic cohesion, as noted by Lancaster (2023). For example, while Participant A's synthesis highlighted intertextuality and argument comparison, ChatGPT merely restructured key points without engaging critically, echoing findings by Çeşme (2022) regarding the limitations of AI-generated content in fostering nuanced academic discourse.

Variability in Human Strategies and Their Impact

Human responses revealed significant variability in synthesis strategies, shaped by cognitive styles and academic backgrounds. This adaptability contrasts sharply with the uniformity of AI-generated outputs, as highlighted by Hamilton et al. (2023), who emphasized the complementary role of AI in supplementing but not replacing human cognition. For instance, Participant B incorporated quantitative evidence to support claims, while Participant C focused on linguistic precision to ensure conceptual accuracy. This adaptability mirrors the challenges noted by Al-Shredi (2024) in fostering critical engagement among students who rely on mechanistic paraphrasing techniques.

Comparative Analysis of Paraphrasing Techniques

The analysis revealed that human paraphrasing demonstrated critical evaluation, contextual adaptation, and lexical variation. Sulistyaningrum (2021)

Table 2: Comparison of how masteral students and AI-based text generation tools approach paraphrasing techniques, highlighting both similarities and differences in their methods.

Themes or Categories	Masteral Students	AI-based Text Generation Tools (Chat GPT)	Comparison
Original Content Understanding	Both demonstrate clear understanding by summarizing key concepts and critiquing paradigms.	Demonstrates clear understanding by summarizing key concepts and critiquing paradigms.	Similar approaches in understanding and summarizing content.
Paraphrasing Techniques	Utilize effective paraphrasing techniques by rephrasing and retaining main ideas and arguments.	Utilizes paraphrasing techniques by rephrasing and retaining main ideas and arguments.	Both groups effectively employ paraphrasing techniques.
Critical Analysis and Interpretation	Go beyond paraphrasing to offer critical analysis and propose alternatives.	Lacks critical analysis and proposal of alternatives, focuses more on summarization.	Masteral students excel in critical analysis and proposal of alternatives.
Human-like Understanding and Perspective	Demonstrate a human-like understanding and perspective, incorporating critical thinking and insightful commentary.	Lacks human-like understanding and perspective, focuses more on summarization.	Masteral students infuse personal insights and critical thinking, unlike AI.
Clarity and Coherence	Maintain clarity and coherence in paraphrased responses, effectively conveying main ideas.	Maintain clarity and coherence in paraphrased responses, effectively conveying main ideas.	Both groups ensure clarity and coherence in their paraphrasing.

highlighted the need for enhanced comprehension skills to achieve effective paraphrasing, which was evident in the strategies employed by Master's students. For instance, Participant B's paraphrasing of the PAID evaluation method incorporated critical reflection on AI's reliance on extensive datasets, while ChatGPT's paraphrase merely summarized the concept. Similar challenges in AI paraphrasing have been noted by Wang (2024), who emphasized the need for critical AI literacy to ensure contextual accuracy and depth.

While syntactically sound, AI-generated paraphrases occasionally altered the original text's intended meaning, a limitation consistent with findings by Nurzhanov and Sharipbay (2024). Human paraphrasing, by contrast, carefully reconstructs paragraphs to enhance logical flow and argument progression, aligning with the instructional needs identified by Ovilia et al. (2022).

Expanded Critique of AI Limitations

Despite its efficiency, AI-based text generation presents notable limitations, including a lack of contextual awareness and critical reasoning. Makeleni et al. (2023) identified similar challenges in AI tools failing to critique source credibility or adapt to specific linguistic contexts. Addressing these shortcomings requires enhancements such as context-aware algorithms and adaptive learning models, as recommended by Ma et al. (2023) and Yusuf et al. (2024).

Pedagogical Implications

The findings emphasize the importance of integrating AI literacy into academic writing pedagogy. Educators should equip students with skills to critically evaluate AI-generated content, as sugg ested by Escalante et al. (2023), who advocated for a blended approach combining AI efficiency with human oversight. Additionally, targeted faculty training programs on AI in academic writing can help educators design assessments that discourage uncritical reliance on AI, ensuring that tools like ChatGPT serve as learning enhancements rather than replacements for human cognition.

This study underscores the complementary nature of human and AI-driven writing processes. While AI tools excel in efficiency and structural coherence, they lack the depth and critical reasoning that define human academic writing. A hybrid approach is recommended, integrating AI capabilities with human judgment to foster ethical and effective academic practices. By balancing technological innovation with critical thinking, academic institutions can create a framework that leverages the strengths of both human and AI contributors.

CONCLUSION

The findings of this study underscore the distinct advantages of human cognition in academic writing, particularly in synthesis and paraphrasing. Master's students employed diverse methodologies, integrating critical evaluation, contextual understanding, and cohesive narrative construction into their writing. Their ability to synthesize information through multiple perspectives and personal insight highlights the irreplaceable role of human judgment in meaning-making. In contrast, AI-based text generation tools, while demonstrating efficiency in restructuring content, lacked the depth of analysis, intertextual awareness, and reflective engagement that characterize high-quality academic writing.

Despite the efficiency and accessibility offered by AI tools, the study revealed challenges associated with over-reliance on AI-generated paraphrasing and synthesis. Although grammatically sound and structurally coherent, AI-generated outputs often failed to evaluate sources critically, identify implicit arguments, or integrate broader contextual understanding. These limitations suggest that AI remains a supplementary tool rather than a replacement for human academic writing.

From a pedagogical perspective, these findings have important implications for academic writing instruction. Given the increasing integration of AI in education, it is crucial to foster critical thinking skills among students to ensure that AI tools are used responsibly and effectively. Academic institutions should incorporate AI literacy training within writing courses, guiding students in critically evaluating AI-generated paraphrases and synthesized texts. Furthermore, educators should design assessments that encourage deeper cognitive engagement, preventing students from passively relying on AI without understanding the underlying arguments of a text.

Additionally, this study highlights the need for continued research and development of AI-based paraphrasing tools. Future improvements should enhance AI's ability to engage in critical reasoning, recognize source credibility, and generate more nuanced paraphrases. Developers should work toward creating adaptive AI models that align with academic writing conventions, allowing for greater flexibility in integrating AI into educational settings.

Ultimately, the findings emphasize the importance of a balanced, human-centered approach to AI-assisted writing. While AI offers valuable support in enhancing efficiency, it should be used with human critical thinking, interpretation, and analytical skills. By leveraging AI's and human cognition's strengths, students can develop a more effective, ethical, and informed approach to academic writing, ensuring that technology serves as an enabler rather than a hindrance to intellectual growth.

AUTHORS' CONTRIBUTIONS

ALF conceptualized the whole research, while EV provided research advice and guidance.

CONFLICT OF INTEREST

The authors declare that no financial, personal, or professional relationships with other individuals or organizations that could be considered a conflict of interest.

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ABOUT THE COVER

WHERE NATURE INSPIRES DISCOVERY. Set against a backdrop of raw, unspoiled beauty, Romblon Island offers a serene yet dynamic environment for research and development. Its rich biodiversity, striking landscapes, and vibrant cultural heritage create the perfect setting for innovation grounded in nature. This is a place where ideas grow alongside ancient trees, and knowledge is shaped by the land itself. Echoing the majesty of Mt. Guiting-Guiting as shown on the back cover, this captures the spirit of exploration, where every path leads to discovery and every view invites breakthrough.

Kenneth Dave Castillon/REDI Media Officer

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