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Misamis Oriental, 9000

IGALAAY
Multidisciplinary Research Abstract

The Official Research Abstract Publication of City College of Cagayan de Oro

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City College of Cagayan de Oro
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Editorial Board

About the Publication

The Higalaay Multidisciplinary Research Abstract is the official abstract publication of the City College of Cagayan de Oro (CCCDO). This annual volume compiles all accepted abstracts presented during the Higalaay Multidisciplinary Research Festival, held every August in celebration of the Higalaay Festival of Cagayan de Oro City – The City of Golden Friendship.

The publication aims to highlight research and scholarly work in various disciplines, promoting inclusive innovation, critical inquiry, and sustainable futures. It is a platform for both faculty and student researchers to contribute to meaningful knowledge production across education, social sciences, technology, and more.


1st International RESEARCH Conference
2nd
IGALAAY
Multidisciplinary Research Festival

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Message of the City Mayor

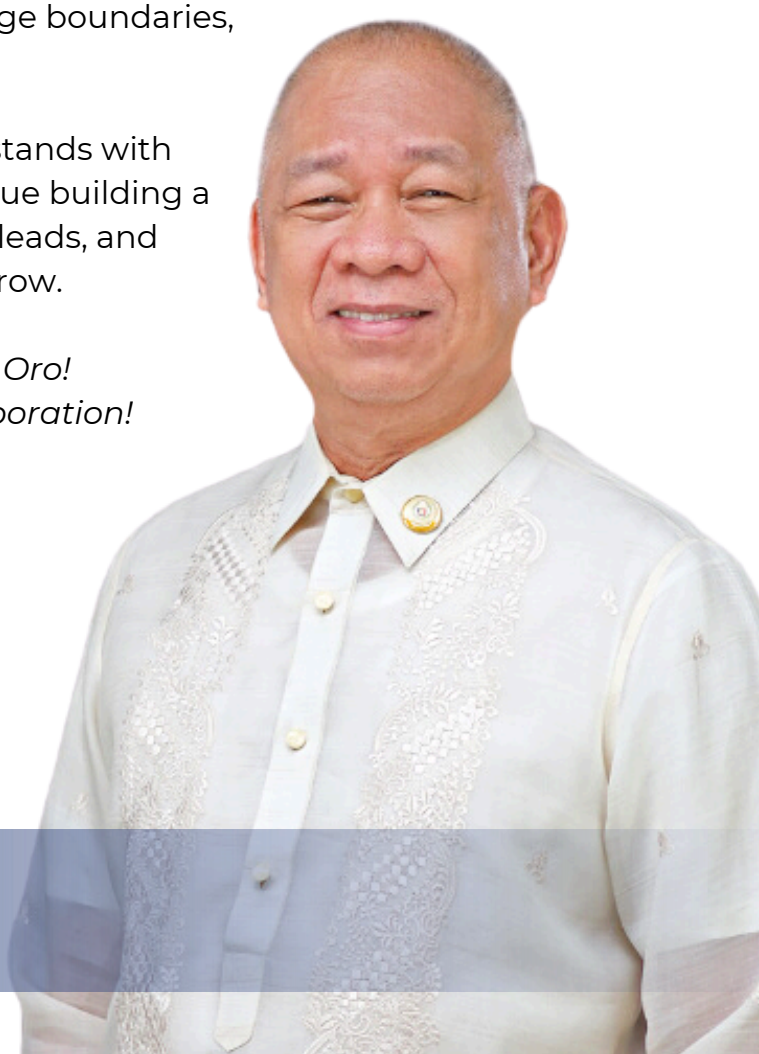
To the organizers, participants, and academic partners of the 1st International Research Conference and 2nd Higalaay Multidisciplinary Research Festival 2025, I extend my warmest congratulations and commendations. This event marks an important milestone not only for the City College of Cagayan de Oro but for the entire city as we continue to champion the values of academic excellence, research engagement, and institutional collaboration. I am proud to celebrate with you a moment of both local and global significance. The recent recognition of CCCDO in the 2025 Sustainable Development Goals (SDG) Impact Rankings is a remarkable achievement that highlights the institution's growing contribution to the global academic and development landscape. It affirms your deepening commitment to meaningful research, inclusive education, and community-focused innovation.

This milestone is a strong reflection of the vital role that CCCDO plays in addressing both global and local challenges. Through your dedication to sustainable practices, transformative learning, and research that uplifts lives, you are shaping a better, more equitable future for the people of Cagayan de Oro and beyond.

To our researchers, educators, students, and partners—may this conference serve as a catalyst for deeper inquiry, stronger collaboration, and lasting impact. Let your ideas challenge boundaries, inspire action, and drive positive change.

The City Government of Cagayan de Oro stands with you in this journey. Together, let us continue building a city where knowledge thrives, innovation leads, and every dream is given the opportunity to grow.

Mabuhay the City College of Cagayan de Oro!
Mabuhay the spirit of research and collaboration!



Hon. Rolando "Klarex" A. Uy
City Mayor

Message of Support

USA KA BULAWANONG ADLAW HIGALA!

Research is the foundation of progress. It lights the way for smarter decisions, stronger policies of our government, and better lives of our people. As Vice Mayor leading the 21st City Council of Cagayan de Oro, I proudly support the "1st International Research Conference and 2nd Higalaay Multidisciplinary Research Festival 2025" of the City College of Cagayan de Oro (CCCDO). This event is a vital step in turning knowledge into action, in bridging the gap between research to policy and improving the quality of life for our people.

The 21st City Council believes in the power of research to shape our city's future. We need ideas that solve real problems, from education to disaster readiness, from health care to economic growth. The City College's commitment to the Sustainable Development Goals (SDGs) shows how local research can have a global impact. By bringing together experts, students, and leaders, this conference fuels innovation and collaboration.

To the researchers, your work matters. Every study, every discovery, helps build a stronger Cagayan de Oro. Let this festival inspire bold ideas and lasting change. Together, we can turn research into real solutions—for our city, our nation, and beyond. May this gathering inspire more collaborations that uplift Cagayan de Oro.

Congratulations, and may this festival be a success!
Daghang salamat!

Hon. Jocelyn "Bebot" Rodriguez
City Vice Mayor

Message of Support

I am honored and excited to take part in the 1st International Research Congress and the 2nd Higalaay Multidisciplinary Research Festival—remarkable events that highlight our city's growing culture of research, collaboration, and innovation.

These gatherings serve as a platform for knowledge-sharing and meaningful dialogue across disciplines. They are a celebration of the tireless efforts of our academic and research communities, whose work continues to inform, inspire, and transform the way we understand and respond to the challenges around us.

Research plays a vital role in shaping the future of our society. It opens doors to new possibilities, provides solutions to real-world problems, and drives development across all sectors. The studies presented in this congress and festival reflect that purpose—each one offering insights that can influence policy, improve lives, and contribute to the greater good.

To the organizers, presenters, and participants—thank you for your hard work and dedication. Your commitment to knowledge and innovation brings pride to Cagayan de Oro and sets the stage for a brighter, more informed future.

Daghang salamat, and may this gathering continue to inspire meaningful research and lasting impact.

Hon. Moreno Y. Daba IV
Chairperson, Committee on Education

Message of Support

It is with great respect and admiration that I extend my warmest greetings to all contributors of the 1st International Research Conference and the 2nd Higalaay Multidisciplinary Research Festival 2025. This publication stands as a lasting reflection of our collective commitment to academic excellence, active research engagement, and meaningful collaboration.

The pages of this book are filled with the passion, creativity, and dedication of scholars who embody not only the pursuit of knowledge, but also the courage to question, the willingness to embrace new perspectives, and the drive to help shape a better future for society.

With the active involvement of local colleges and partner institutions, this body of work highlights what is possible when academic communities come together across disciplines and boundaries. It serves as a powerful reflection of the strength of partnership and the transformative power of shared intellectual pursuit.

May the research compiled here continue to spark meaningful conversations, broaden understanding, and drive positive change. As we move forward, may we continue to nurture a culture of research that enlightens minds, empowers communities, and inspires lasting impact.

Congratulations to all researchers, and may your contributions leave a mark within and beyond the academic world.

Maricelle M. Nueva, Ph.D
President, Association of Local Colleges and Universities (ALCU) Region X

Message of Support

Welcome to the 2nd Higalaay Research Festival and the 1st International Research Conference of City College of Cagayan de Oro!

At a time when global uncertainties are redefining education, equity, and sustainability, research emerges not as an option but as a necessity. In the Philippine context, there is growing recognition that we must return to—and strengthen—the very foundations of our education system. This demands more than anecdotal fixes; it calls for sustained inquiry, evidence-based solutions, and research that speaks to the urgent needs of both policy and community. When pursued with rigor and relevance, research becomes a catalyst for institutional reform, public accountability, and inclusive development. It is not a privilege of well-established universities—it is a moral and academic responsibility of any institution, however young, that seeks to serve its people with purpose and vision.

As a local college still in its early years, City College of Cagayan de Oro takes this responsibility seriously. We believe that a meaningful education must go beyond the classroom and respond directly to the needs of society. This is why we have anchored our work in research and innovation—not as aspirations, but as imperatives. Despite our youth, we have already been recognized on the global stage through the World University Rankings for Innovation (WURI) and the Times Higher Education (THE) Impact Rankings. These recognitions do not merely reflect institutional prestige—they represent our growing commitment to place local knowledge into global conversations, and to turn academic outputs into real-world outcomes.

To our faculty, students, researchers, and partners: let this gathering remind us that our work matters. That every paper presented, every idea debated, and every partnership formed is a step toward a more thoughtful, more equitable, and more responsive future City College stands at the intersection of aspiration and action And as we look ahead, we will continue to pursue research that empowers, innovation that uplifts, and education that leaves no one behind.

Daghang salamat, and may this conference be both a celebration of what we have achieved—and a call to what we must yet become.

Jestoni P. Babia, LPT, MaEd, Ed.D
President, City College of Cagayan de Oro


1st International RESEARCH Conference
2nd
IGALAAY
Multidisciplinary Research Festival

RATIONALE

The 1st International Research Conference and 2nd Higalaay Multidisciplinary Research Festival 2025 stands as a premier academic assembly committed to fostering global partnerships, advancing multidisciplinary inquiry, and cultivating scholarly excellence. Proudly hosted by the City College of Cagayan de Oro in collaboration with the Local Government Unit of Cagayan de Oro City, this landmark event forms part of the city-wide Higalaay Festival 2025, embodying the spirit of unity, cultural vibrancy, and intellectual advancement that defines the city's identity.

At its core, the conference is anchored on the belief that research must be deeply responsive to the evolving needs and aspirations of communities. The rich cultural heritage, dynamic economic landscape, and innovation-driven governance of Cagayan de Oro offer an ideal milieu for rigorous academic discourse that resonates locally while contributing to the global research ecosystem. Despite increasing research engagement in the region, there remains a significant need for more international collaboration and wider dissemination of scholarly outputs.

This international conference seeks to address the gap through:

knowledge sharing by student-researchers, professionals and innovators

collaboration and stakeholders networking

co-creating solutions to pressing social concerns/ problems

Framed within the festive and collaborative spirit of the Higalaay Festival 2025, this conference aspires to position Cagayan de Oro as an emerging hub of research-driven innovation in the region. It aims to foster meaningful partnerships among local and international academic institutions, government agencies, industries, and civil society in pursuit of sustainable solutions to complex societal challenges.

In doing so, the event promotes the critical role of integrating academic research with policy-making and the Sustainable Development Goals (SDGs), illustrating how scholarship can directly inform inclusive growth and resilience.

This initiative directly aligns with the administration's strategic governance framework—"Kanunay Nag-Alagad," branded as RISE Cagayan de Oro City, which emphasizes:

R – Regional Leadership: Metropolization, Accessibility, and Connectivity;
I – Institutional Development and Participatory Governance;
S – Safety, Security, and Social Development; and
E – Economic Recovery

In particular, the Higalaay Research Festival 2025 operationalizes the third pillar of the RISE agenda by advancing safety, security, and human development (RISE Section 2.4.3.3). As a critical forum for knowledge generation and policy dialogue, the festival serves as a catalyst for creating a resilient, inclusive, and forward-looking city. Research contributions focusing on disaster risk reduction, urban safety, public health, governance, education, and welfare will provide actionable insights for local decision-makers and community leaders.

Moreover, by prioritizing human development, the festival amplifies research that addresses equity, empowerment, cultural vitality, and social mobility—ensuring that academic work transcends theory and contributes to shaping responsive and transformative governance. Ultimately, this gathering not only fortifies the city's research capacity but also reinforces its identity as a center for knowledge, innovation, and sustainable progress within the region and beyond.

PROGRAM

7:00 AM	**Registration**
8:00 AM	**Preliminaries** *Invocation, National Anthem, Cagayan de Oro March* *City College Hymn*
8:10 AM	**Welcome Remarks** ***Jestoni P. Babia, Ed.D**, City College President*
8:20 AM	**Oro Dayaw Dance Troupe**
8:30 AM	**Message of Support** ***Hon. Moreno Y. Daba IV*** *Chairperson, Committee on Education* *21st City Council, Cagayan de Oro City* ***Hon. Rolando "Klarex" A. Uy*** *City Mayor, Cagayan de Oro City* ***Arlita Amapola B. Minguez, Ph.D*** *OIC- Regional Director, Commission on Higher Education Region X* ***Maricelle M. Nueva, Ph.D*** *President, Association of Local Colleges and Universities (ALCU) Region X*
9:00 AM	**City High Dance Troupe**
9:10 AM	**Rationale & Reading of Mechanics** ***Joel D. Potane, Ph.D**, Vice President for Urban Nexus for Licensing Intellectual Property, Research, Innovation, and Creative Enterprise*
9:20AM	**Ceremonial Memorandum of Agreement Signing** *Consortium of Misamis Oriental Local Colleges*
9:25 AM	**Xavier University Cultural Dance Troupe**
9:30 AM	**Introduction of Speakers**

10:10 AM	**Plenary Speaker 1** ***Prof. Darren Hawkins,*** *Professor of International Relations* *Political Science Department, Brigham Young University, Provo, Utah* *Reactor:* ***Ray Butch D. Mahinay, Ph.D***
10:55 AM	**Plenary Speaker 2** ***Nabiilah Aziizah Tjandra****, Graduate Student* *Instrumentation Engineering, Institut Teknologi Sepuluh (ITS), Indonesia* *Reactor:* ***Helmae E. Tapanan, Ph.D***
11:30 AM	**Plenary Speaker 3** ***Say Sokunpharoth****, Deputy Head of the Aid Coordination Office* *Cambodia Department of Planning at the Cambodian Ministry of Education, Youth and Sport* *Reactor:* ***Prof. Jonathan A. Madronero***
12:10PM	**Plenary Speaker 4** ***Dr. Ronald C. Donceras,*** *International Mathematics Teacher* *Harlem High School, Montana, USA* *Reactor:* ***Mark Raymond Tan, EdD***
1:00 PM	**Research Poster Presentation**
3:00 PM	**Awarding Ceremony**
3:30 PM	**Closing Remarks** ***Jean T. Loquillano, Ph.D****, Research Director*

Dr. Kurt S. Candilas & Ms. Abygail Salcedo
Masters of Ceremony

Mechanics of Poster Presentation

1. Poster Presentation Requirements

Accepted research entries for the poster presentation must follow the prescribed template, ensuring a uniform and professional appearance across all submissions. The poster should be 48" × 36" in vertical/portrait orientation. In team research, only the lead researcher is advised to attend the in-person event to present the poster. This ensures that each research team is represented effectively while streamlining the logistics of the event.

The layout should be well-organized, typically following the IMRAD format (Introduction, Methods, Results, and Discussion), except for Category 3 (Innovation Concept for High School), which excludes the Results and Discussion sections.

Introduction should provide background information and state the research question or hypothesis.

Methods section should briefly outline the research design, participants, procedures, and analysis.

Results should be presented using charts, graphs, and images that make the data easy to understand briefly.

Discussion should interpret the findings, noting their significance and potential implications. Ensure all text is legible from a distance, using bullet points to break up large blocks of text, and maintain a consistent color scheme and font style throughout.

During the presentation, stand by your poster to engage with viewers, summarizing your research and answering questions. Begin with a brief overview, highlighting the key points, then delve into more detail based on the audience's interest and questions.

2. Criteria for Poster Presentation

The criteria for evaluating posters in the poster presentation category are as follows:

Content (40%)- assesses the depth and relevance of the information presented. It includes the clarity of the research question, the thoroughness of the methodology, the significance of the results, and the interpretation in the discussion.

Design and Visual Appeal (30%)- measures the effectiveness of the poster's visual presentation. It includes the use of color, layout, and graphics to make the poster engaging and easy to read. It also considers the organization and overall aesthetics.

Clarity and Readability (15%)- evaluates how well the text and visuals communicate the research. It includes font size, text clarity, and the logical flow of information. The poster should be easy to understand at a glance and should not be cluttered.

Presentation (10%)- examines the presenter's ability to communicate their research effectively. It includes their engagement with viewers, the clarity of their explanations, and their responsiveness to questions.

Adherence to Guidelines (5%)- checks if the poster follows the prescribed template and other submission guidelines, including dimensions and orientation.

Category A

(Graduate/Professional)

ABSTRACTS

Category A (Graduate/Professional)

THE MEDIATING ROLE OF TECHNOLOGY ADOPTION IN THE RELATIONSHIP BETWEEN TOURISM MARKETING STRATEGIES AND BUSINESS PERFORMANCE

Dr. Jhun Victor R. Quebral, LPT
Balingoan College of Misamis Oriental

Tourist accommodation is one of the tourism industry segments that provide temporary comfort and shelter to guests and provides visitors the opportunity to stay for a length of time to enjoy the locality and its amenities, services and attractions, while their spending contributes to the local economy. This study examines the mediating role of technology adoption in the relationship between tourism marketing strategies and business performance among accommodation operators in the Caraga Region, Philippines. Using a correlational quantitative research design, the study surveyed 135 respondents through a structured questionnaire. The findings revealed that tourism marketing strategies were generally weak, particularly in areas of pricing, accessibility, and promotion. While digital transaction security showed positive attributes, technology adoption remained low due to integration and usability challenges. Business performance was assessed through occupancy rates, revenue growth, customer satisfaction, and operational efficiency. Statistical analysis demonstrated that tourism marketing strategies had a modest but significant impact on business performance. Technology adoption emerged as a critical mediating factor, substantially enhancing the relationship between marketing strategies and overall business outcomes. The mediation analysis confirmed that technology adoption significantly amplifies the effectiveness of marketing efforts. The research underscores the critical importance of strategic technology integration in tourism marketing. By addressing technological adoption gaps and refining marketing approaches, accommodation operators in the Caraga Region can potentially improve their competitive positioning and business performance.

Keywords: *digital transformation, tourism marketing, technology adoption, business performance, hospitality industry, customer relationship management*

Category A (Graduate/Professional)

HANAS: A PROPOSED TESDA TVET INNOVATION CENTER IN ALUBIJID, MISAMIS ORIENTAL

Voltaire E. Lopez II
University of Science and Technology of Southern Philippines

Currently, Misamis Oriental-West lacks a comprehensive TESDA Training Center which will help people learn trade and technical skills that will open up livelihood and job opportunities. Comprehensive, one-stop TESDA Training Centers are rich in the eastern part of Misamis Oriental, which is also reasonable since they also have a greater population making it practical to house a facility in that area. However, population growth in the West is on a steady rise, and the boom of the City of El Salvador has been a driving factor for industries, stakeholders, and investors to invest in the West. Ayala Lands is one of those visionaries who saw the potential in the West, specifically in the municipalities of Laguindingan and Alubijid, by investing 3.8 billion to develop the Habini Bay multi-estate project. Concurrently, the emergence of Industry 4.0 demands specific skills and knowledge from our workforce, which the country is currently responding to through the formation of Innovation centers. The proposal is to create a solution for these three-part factors, by providing a comprehensive TESDA TVET Innovation Center in the Misamis Oriental-West which will define the regional identity of the West. As a result, the Proposed TESDA TVET Innovation Center will answer the needs of the West, complement and supplement the job opportunities in the emerging Habini Bay and it will also create a competitive, relevant, and knowledgeable workforce ready for the fourth industrial revolution.

Keywords: *TESDA, Skilled workforce, Innovation center, Industry 4.0, Ayala Lands*

Category A (Graduate/Professional)

SOLID WASTE MANAGEMENT PRACTICES IN GINGOOG CITY: AN ASSESSMENT OF COMPLIANCE WITH THE REPUBLIC ACT 9003

Mark Anthony A. Catiil
Gingoog City United Colleges

The study aimed to assess the compliance of the people of Gingoog City, Northern Mindanao, Philippines, with Republic Act 9003 or the Ecological Solid Waste Management Act of 2000. This descriptive research was participated by 78 residents of the seven (7) identified barangays in Gingoog City who were selected purposively. A survey was carried out using a self-administered and validated questionnaire with open ended questions. Out of 78 participants, 35 are professionals, 23 are students, and 20 are plain homemakers. The results revealed that 58% of the participants are aware of the existence of RA 9003 and the corresponding penalties thereof if not followed. However, only 26% of the participants said that they are practicing solid waste segregation and disposal properly. Moreover, in terms of the implementation and monitoring system of the law by the government authority, 68% of the participants are not satisfied. It implies that the concerned office in the implementation and monitoring of the law or ordinance is not performing diligently its mandated functions. To improve the degree of compliance with the said law, some of the suggestions made by the participants include strict implementation of the penalty should be imposed on those who violate the law; more seminars should be conducted for the residents to increase awareness and the impact of non-compliance to the environment; and there must be a Materials Recovery Facility (MRF) in every barangay to maintain proper segregation of wastes.

Keywords: *compliance, descriptive design, pollution, resident's satisfaction, solid waste management*

Category A (Graduate/Professional)

AlgeOps AND TRADITIONAL BOARD DISCUSSION AS INTERVENTIONS IN LEARNING OPERATIONS ON INTEGERS

Katrina M. Ortega
Roberto E. Sato Memorial National High School

This research compared the effects of using AlgeOps and traditional board discussion as interventions for Grade 7 students on the addition and subtraction of integers. The experimental group 1 was composed of 20 students exposed to traditional board discussion and another 20 students composed experimental group 2 exposed to AlgeOps. A pretest and posttest were administered to both groups as well as a focus group discussion to know their views. The pretest means of the two groups were Below Average. The posttest mean of the experimental group 1 still Below Average while the posttest mean of the experimental group exhibited Average performance. There was a significant mean improvement from the pretest to the posttest in Mathematics for the experimental group 2 which was exposed to AlgeOps. Students found AlgeOps as intervention more effective than the traditional board discussion in learning integer addition and subtraction.

Keywords: *AlgeOps, traditional board discussion, integer addition and subtraction, intervention*

Category A (Graduate/Professional)

CONTEXTUAL TEACHING AND LEARNING APPROACH IN MATHEMATICS FOR STEM STUDENTS ON BLENDED LEARNING MODALITY

Franz A. Mag-usara
University of Cebu - Banilad

This study analyzed the effectiveness of Contextual Teaching and Learning (CTL) approach in enhancing the academic performance in Mathematics of Senior High School STEM 11 students on a blended learning modality. The study employed a quasi-experimental method of research which utilized pretest-posttest with control group design. The control group composed of 37 students exposed to conventional lecture method and the experimental group composed of 34 students exposed to CTL approach in a private school in Cebu City, were selected as respondents. After the intervention, the experimental group went through a focus group discussion. After analysis, data showed that the control group had a mean gain of 1.891 on the pretest posttest performance and the experimental group had a mean of 10.176 which has an absolute difference of 8.28 and p-value (0.011) less than the α set at 0.05. Thus, there is a significant difference between control and experimental group in Mathematics academic performance. Based on the result, CTL approach is working more effectively than the conventional approach. The utilization of the Contextual Teaching and Learning Approach is a potential method for enhancing students' academic performance of the students in Basic Calculus. However, it still faces some challenges, especially the lack of resources – internet connection. Hence, an instructional design was proposed to aid the orchestration of the CTL approach.

Keywords: *CTL approach, blended learning modality, conventional lecture method, Basic Calculus*

Category A (Graduate/Professional)

PROJECT SCAFFOLD (SUPPORT CHANNEL TO ASSIST FACT FINDERS ORGANIZE LOGICAL DISCOURSE): A SYSTEMATIC INTERVENTION TO BRIDGE GAP IN RESEARCH SKILLS AMONG SHS STUDENTS

Suzy May R. Fabular & Arlene B. Valmoria
Macabalan National High School

The integration of Practical Research courses in the Philippine K to 12 Basic Education Curriculum seeks to equip Senior High School (SHS) students with essential research skills. However, many students face significant challenges in conducting research due to insufficient foundational competencies and limited prior exposure to research methodologies.This study primarily aims to assess the effectiveness of Project SCAFFOLD (Support Channel to Assist Fact-Finders Organize Logical Discourse), an intervention that provides structured, collaborative mentorship between teachers and students to support SHS learners in completing their research projects.Using a mixed methods design, the study collected both quantitative and qualitative data through formative and summative assessments, student feedback, and teacher observations at Macabalan National High School. Comparative analysis of students' performance and perceptions before and after the intervention revealed notable improvements in their understanding of research processes, task completion, and engagement with research work.The findings confirm that Project SCAFFOLD significantly enhanced students' research competencies and contributed to the establishment of a positive, research-driven culture within the school.In conclusion, the study underscores the importance of structured support systems in addressing gaps in research instruction. It is recommended that Project SCAFFOLD be institutionalized across other schools in the North 1 District and potentially adopted in other divisions to ensure successful delivery of Practical Research courses and to strengthen research education across the basic education system.

Keywords: *scaffold, mentoring, research skills*

Category A (Graduate/Professional)

PROYEKTO KUGOS: A NEEDS-BASED PROGRAM FOR THE SOCIO-ECONOMIC EMPOWERMENT OF SOLO PARENTS IN CAGAYAN DE ORO

Jerwin S. Borres, John David O. Moncada, and Maria Angeles D. Hinosolango
University of Science and Technology of Southern Philippines

Solo parents often encounter challenges such as financial instability, limited job opportunities, and insufficient childcare support. These issues affect both their daily living conditions and the developmental needs of their children. In response, Proyekto Kugos was launched as a community-based university project initiative guided by an action research framework. It aims to strengthen the socio-economic stability of solo parents through targeted skills training, psychosocial support, and livelihood-oriented interventions. A needs assessment involving 35 solo parents from Cagayan de Oro was conducted to identify their key concerns. The study employed a structured survey to gather quantitative data, which were analyzed using descriptive statistical techniques such as frequency counts and mean computation. Findings revealed financial constraints, work-life imbalance, and limited awareness of available government support services. Respondents also showed strong interest in enhancing digital communication, content creation, and entrepreneurship skills. The study suggests that data-driven, community responsive programs can be strategically designed to address the multifaceted needs of solo parents in urban areas. While the effectiveness of the program remains to be evaluated, this provides a strong foundation for informed intervention planning. It is recommended that local governments and institutions consider these findings when designing inclusive grassroots interventions aimed at improving the quality of life of solo parents.

Keywords: *solo parents, community development, digital skills, needs assessment, gender responsive programs, action research*

Category A (Graduate/Professional)

LOST TOWN OF MAKAR: A COUNTER-NARRATIVE TO SETTLER HISTORIES IN GENERAL SANTOS CITY

Elrish Jay N. Felamin
Mindanao State University - General Santos City

The arrival of 62 settlers, led by Gen. Paulino Santos, in what is now General Santos City, is often considered synonymous with the city's origin. Terms such as "pioneer," "first," and "early settler" predominantly feature in the city's existing historical accounts. On the other hand, Makar, an area on the northwestern coast of Sarangani Bay, is sporadically mentioned in old documents dating as far back as the late Spanish period. It served various roles across different periods. Contemporarily located within General Santos City, it is however no longer an official territory of the city. Despite its historical significance, Makar lacks recognition and remains largely unresearched, likely due to the pervasive dominance of the settler narrative. This study aims to address this oversight by reconstructing General Santos City's pre-settler significance and exploring how this once-significant settlement underwent transformations. Employing historical-descriptive and archival methodologies, this research draws upon an extensive collection of accessible but underutilized documents in local history. These include administrative and military reports, census data, letters, and resolutions dating back to the 1800s. Findings reveal that the history of Makar offers a compelling counter-narrative to dominant settler histories. The Rajahnate of Malok, the Buayan Sultanate's strategic use of Makar's port, and the area's established significance for maritime trade and agriculture all point to a rich, pre-settler history—a past obscured by conventional city histories. Pre-existing structures of power and trade were well-established long before the arrival of the migrant settlers in the area. In a broader sense, Makar's history mirrors broader Philippine colonial experiences: a microcosm of national history. This pioneering study provides a foundation for further research into local histories in Southern Mindanao and serves as a counter-memorialization to the dominating narrative of the city's local history.

Keywords: *counter-narrative, local history, Mindanao, pre-settlement, internal colonialism*

Category A (Graduate/Professional)

BEYOND "STAGE FRIGHT": UNMASKING THE LINK BETWEEN SELF-ESTEEM AND PUBLIC SPEAKING ANXIETY IN A POST PANDEMIC WORLD

Jet Hokin Paclar, MAED
Xavier University – Ateneo de Cagayan

Public speaking is an essential skill in education and professional settings, yet many students experience significant anxiety when speaking before an audience. This study investigates the relationship between self-esteem and public speaking anxiety (PSA) among Grade 8 students at Xavier University – Ateneo de Cagayan Junior High School (XUJHS), particularly in the post pandemic context. Using Rosenberg's Self-Esteem Scale (1965) and the Public Speaking Anxiety Scale (PSAS) by Bartholomay and Houlihan (2016), the study examined the extent to which self-esteem influences PSA levels. The research also considered other factors such as sex, exposure to public speaking, English academic performance, and social-emotional learning (SEL) components - social awareness, self-efficacy, and self-awareness. Findings revealed a significant negative correlation between self-esteem and PSA, confirming that students with lower self-esteem exhibited higher PSA levels. Females reported having higher PSA levels than males. Additionally, students reported that the transition from online learning to onsite education post-pandemic contributed to heightened anxiety, particularly due to reduced opportunities for verbal interaction during remote learning. Consistent with previous literature, the study found that exposure, self-efficacy and self-awareness are significant determiners of students' anxiety levels (McCroskey, 2019; Othman et al., 2023). The implications of this study highlight the need for targeted interventions to enhance students' self-esteem as a means of mitigating PSA. Schools can implement structured exposure to public speaking activities, integrate SEL programs, and foster supportive learning environments. Ultimately, enhancing students' self-esteem can play a crucial role in reducing PSA and improving their overall communication skills, thereby supporting academic and professional success.

Keywords: *communication skills, post-pandemic education, public speaking anxiety, self-esteem, social-emotional learning*

Category A (Graduate/Professional)

ATRANSFORMING TEACHING: A COMPREHENSIVE APPROACH TO EMOTIONAL INTELLIGENCE AND COMMITMENT IN CHRISTIAN BIBLE-BASED SCHOOLS

Terence Katherine Stephanie R. Gapol, LPT, MM-EMa
Initao College

This study aimed to describe and determine the Emotional Intelligence of Christian Bible-based Schools (CBBS) Teachers' in Iligan City and understanding their actions in handling Workplace Stress and assessing their Work Commitment to retain in the organization they are working for SY 2023-2024. The data gathered were analyzed and interpreted using the descriptive-correlation method; triangulation was employed to explain, confirm, enrich, and even refute the data gathered. Similarly, this study dealt with the significant relationship between Emotional Intelligence level, Workplace Stress and Work Commitment of the Christian Bible-based Schools (CBBS) Teachers'. The teachers' Work Commitment of Christian Bible-based Schools (CBBS) was not related to their Workplace Stress. It was also discovered that there is no significant relationship between Workplace Stress and Work Commitment. Furthermore, it may be advised to conduct additional research and investigation to learn more specifics about the need to enhance teachers' Work Commitment, which are in some ways related to their Emotional Intelligence and the stress they are under at work. This will further result in teachers' commitment to their work to stay longer, giving them a sense of value and dignity that will enable them to extend their career plans and engagements for the future.

Keywords: *Emotional Intelligence, Workplace Stress, Work Commitment, Christian Bible-based Schools, Christian Schools*

Category A (Graduate/Professional)

COMMUNITY LEVEL ANALYSIS OF A PROPOSED HIGH-RISE DEVELOPMENT IN UPTOWN CAGAYAN DE ORO CITY, PHILIPPINES

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As the number of people living in urban areas in the Philippines has been expected to increase, the UN Habitat reports that by 2050, there will be a rapid shift towards urbanization as 84 % of Filipinos are expected to live in urban areas. This involves land conversion and built-up expansion while utilizing marginal lands at the expense of social and environmental degradation. Cagayan de Oro City is not an exemption to the massive development plan for metropolitanization. As the city currently experience massive growth and expansion, real estate development has become widespread in the area particularly high-rise developments. This study aimed to assess the community-level perspective on the impacts of high-rise development in Uptown area of Cagayan de Oro City. By employing a face-to-face survey from the residents of low-rise subdivisions located in Uptown, Cagayan de Oro using a self-administered paper-based questionnaire, the results of the study revealed that the least acceptable characteristic of the development is the height of the building in which as the scope and height of the building decreases, its acceptability increases. Moreover, respondents identified positive impacts of the high-rise development such as increase in the infrastructure in the area, less strong winds during typhoons, the use of water recycling technologies, more commercial establishments, and high prestige associated in the area. However, many of the respondents also identified negative impacts such as increased amount of solid waste, increase in noise level, decrease in water quality, increased level of traffic congestion, increase in fuel consumption, and health hazards due to air pollution among others. Findings from this study have showed how important stakeholders' participation particularly those who are affected should be involved in planning in major development projects such as high-rise buildings. Social acceptability should be prioritized so that quality of life, overall satisfaction, and sense of place in those existing communities are not worsened.

Keywords: *Cagayan de Oro, community, high-rise development, impacts, social acceptability*

Category A (Graduate/Professional)

COMMUNICATING PHILIPPINE BIODIVERSITY THROUGH TIKTOK: A THEMATIC ANALYSIS OF CELINE MURILLO'S VIDEOS

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This study analyzes the use of short-form digital media as a mode of science communication through a thematic analysis of viral TikTok videos produced by Filipino environmental communicator Celine Murillo. The dataset comprises 29 purposively sampled videos, each exceeding one million views and posted between August 2023 and August 2024. This timeframe corresponds with the onset of Murillo's virality, following her shift toward producing educational content on Philippine biodiversity and natural heritage beginning in January 2023. The research employed thematic analysis to examine both the narrative content and visual composition of the selected videos. Six dominant themes emerged in the construction of message content: Localized Framing of Biodiversity, Everyday Encounters with Nature, Integrated Interdisciplinary Storytelling, Emotional and Relational Framing, Participatory and Dialogic Learning, and Accessible and Multilingual Delivery. These themes highlight Murillo's strategy of embedding scientific knowledge within culturally resonant, emotionally engaging, and linguistically inclusive frameworks. A consistent narrative structure was also observed across all videos, comprising five stages: (1) Hook/Observation, which initiates viewer interest through a sound, question, or visual cue; (2) Identification and Description, introducing the species with local and scientific names; (3) Ecological/Cultural Insight, providing context on habitat, behavior, and cultural significance; (4) Call to Engagement, inviting audience reflection and interaction; and (5) Advocacy Outro, reinforcing environmental advocacy and digital ethics. In addition, the study identified eight recurring visual and stylistic strategies, including On site Documentation and Embodied Presence, Integration of Primary and Secondary Visual Sources, Use of Everyday and Cultural Artifacts, Multimodal Captioning and Multilingualism, Call to Action and Ethical Framing, Performative Naturalism and Prop Use, Consistent Aesthetic Grammar, and Participation and Audience Interactivity. These elements contribute to the videos' accessibility, credibility, and relatability. The findings suggest that short-form digital content, when designed with narrative, visual, and interactive strategies, can serve as an effective tool for inclusive and culturally meaningful science communication. In the Philippine context characterized by rich biodiversity, diverse languages, and strong traditions of oral and visual storytelling, these approaches help localize scientific knowledge, highlight indigenous ecological insights, and encourage public participation in environmental education and advocacy.

Keywords: *Renewable energy, electricity, Piezoelectric effect, Thermoelectric effect*

Category A (Graduate/Professional)

CRAFTING A RESPONSIVE TEACHING FRAMEWORK FOR DATA ANALYSIS: A PHENOMENOLOGICAL STUDY ON STUDENTS' EXPERIENCES IN LEARNING DESCRIPTIVE AND INFERENTIAL STATISTICS

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Initao College

This study employed a phenomenological approach to explore the lived experiences of college students in learning descriptive and inferential statistics, particularly in the context of research coursework at a local community college in the Philippines. Results revealed that students' encounters with statistics are often accompanied by anxiety, confusion, and a gradual development of confidence as they navigate complex concepts, formulas, and statistical software. Persistent challenges included difficulty in choosing appropriate statistical tests, interpreting results, and applying statistical knowledge to real-world research problems. Despite these obstacles, students highlighted several instructional strategies that facilitated their understanding—most notably step-by-step and structured explanations, the use of practical and real-life data, hands-on activities, supportive and patient teaching, visual aids, and collaborative group work. The study, grounded in Ausubel's Meaningful Learning Theory, emphasizes the importance of connecting new knowledge to learners' existing cognitive structures. Building on these insights, the study proposes the Scaffolded Teaching Approach to Transform Statistics Learning (S.T.A.T.S. Framework)—an innovative, student-centered framework that integrates diagnostic assessment, thematic instruction, active engagement, technology-enhanced learning, and regular reflection and feedback. The S.T.A.T.S. Framework is designed to bridge gaps in statistics education by reducing anxiety, making statistical learning more accessible, and fostering both statistical literacy and self-efficacy. This research offers valuable implications for educators seeking to cultivate effective, responsive, and inclusive data analysis instruction in higher education.

Keywords: *Phenomenological Study, Statistics Education, Student Experiences, Scaffolded Teaching, Instructional Framework*

Category A (Graduate/Professional)

STUDENTS' PERCEPTIONS OF GENERATIVE AI IN PERSONALIZED DISTANCE LEARNING: THE MODERATING EFFECTS OF USAGE FREQUENCY AND FACULTY ENCOURAGEMENT

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As generative artificial intelligence (GAI) becomes increasingly embedded in digital education, understanding how students perceive its role in personalized distance learning is critical. This study investigates the relationship between students' GAI utilization and their perceptions of its usefulness, motivational impact, and ethical implications, while examining whether usage frequency and faculty encouragement moderate this relationship. Drawing on a descriptive-correlational design and the use of moderation analysis, data were collected from 327 undergraduate students at Tagoloan Community College using a validated questionnaire (CVI = 0.94). Results from General Linear Modeling revealed that GAI utilization was a significant predictor of students' perceptions ($F = 169.32$, $p < .001$, $\eta^2_p = .345$), indicating that direct engagement with GAI strongly shapes attitudes toward its educational value. However, neither usage frequency ($F = 0.99$, $p = .396$) nor faculty encouragement ($F = 0.75$, $p = .475$) significantly moderated this relationship. These findings challenge assumptions that institutional influence or habitual use enhances GAI's educational impact, highlighting instead the primacy of student agency. While students reported high ethical awareness and motivation associated with GAI, the limited faculty support (11.3%) and dominant reliance on ChatGPT (96.9%) reflect a self-directed yet under-supported learning culture. This study calls for pedagogical frameworks that align with student practices by integrating structured, ethical, and student-centered AI applications to foster autonomy, critical engagement, and responsible use in digital learning environments.

Keywords: *Generative AI, personalized learning, distance education, faculty encouragement, student agency, educational technology*

Category A (Graduate/Professional)

UNDERSTANDING FACULTY CONCERNS AND PROFESSIONAL DEVELOPMENT NEEDS IN INITAO COLLEGE: A QUALITATIVE CASE STUDY

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Initao College

This study explored the concerns, challenges, and perceived solutions related to the professional development of faculty members in Initao College, Initao, Misamis Oriental. Using a qualitative case study design, the research employed purposive sampling to select fifteen faculty members from various departments. Data were gathered through in-depth interviews to capture faculty perspectives and experiences regarding professional development. The researchers followed Creswell and Creswell's (2018) five-step data analysis process: organizing and preparing the data, reading through the data, coding, generating themes and descriptions, and presenting the findings. Three major themes emerged from the analysis: Three major themes emerged from the analysis: (1) Limited institutional support and access to relevant professional development opportunities highlighted how faculty members often felt excluded or uninformed about available training programs. (2) Challenges in applying what was learned reflected the difficulties faculty encountered in implementing new knowledge and skills due to misalignment with their roles, time constraints, and limited resources. (3) A call for systemic improvements emphasized the need for more collaborative planning, increased funding, and stronger administrative leadership in designing and delivering professional development programs. This study concludes that professional development at Initao College requires more accessible, relevant, and well-supported programs to address faculty concerns, enhance teaching effectiveness, and foster a culture of continuous growth. The study recommends that institutions may create structured, inclusive, and accessible development programs aligned with faculty needs and institutional goals.

Keywords: *administrative support, faculty development, institutional challenges, professional growth, qualitative case study*

Category A (Graduate/Professional)

MORPHOSYNTACTIC INNOVATIONS IN ONLINE DISCOURSE: THE 2023 BARANGAY AND SANGGUNIANG KABATAAN ELECTIONS IN MISAMIS ORIENTAL, PHILIPPINES

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Elections serve as a cornerstone of democracy in the Philippines, enabling citizens to select their national, regional, and local leaders. The 2023 Barangay and Sangguniang Kabataan Elections (BSKE), marked by multiple delays and heightened media exposure due to the pandemic, revealed new language styles in political discourse. Despite the constraints of a 10-day campaign period, electoral candidates employed different campaign strategies, including door-to-door campaigns, flyer distribution, social media utilization, and zonal rallies, to articulate their plans and programs. This study investigated the morphosyntactic innovations in campaign speeches during the BSKE in Misamis Oriental. A qualitative research method, specifically structural analysis, was used in this study to examine the unique features of an online campaign of the six (6) municipalities in Misamis Oriental. The study revealed diverse linguistic innovations in political speeches. Candidates demonstrated adaptability through Visayan prefixes like 'maka-,' 'mag-,' 'ma-,' and 'i-,' attached to verb words but preserving their verbal predications. Reduplication added depth to expressions, emphasizing actions or moods. Processes like blending and backformation unintentionally create new words. Syntactic features showed coordination and predication (i.e., verbal predication). Also, SK candidates extensively used code-mixing and code-switching to emphasize, borrow, and convey specific meanings. It shows how local elements influence broader language usage, offering key insights into language development and the dynamic connection between language and politics in the Philippines.

Keywords: *BSKE, Campaign Speeches, Morphosyntactic Features, Online Campaign*

Category A (Graduate/Professional)

A CALL FOR DISCOURSE: A CRITIQUE OF THE PROPOSAL TO REMOVE ETHICS FROM THE GENERAL EDUCATION CURRICULUM IN LIGHT OF IRIS YOUNG'S POWERLESSNESS AS A FACE OF OPPRESSION

James Patrick B. Pabonita
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This paper attempts to appropriate Iris Marion Young's essay on Powerlessness as a Face of Oppression to the issue of powerlessness in the proposal to remove the subject of Ethics from the General Education Curriculum in the Philippines. This appropriation is divided into three inquiries. The first inquiry examines Young's division of labor from a Foucauldian understanding of the movement of power, appropriating it to today's context, which has now become the division of power. The second inquiry examines how powerlessness leads to the denial of expertise, undermining the competence of experts in the field and perpetuating injustice. Lastly, the third inquiry examines Young's alternative, that is, communicative democracy, and the appropriate response to the current issue of powerlessness in the proposal to remove the subject, which is to advocate for fair and just discourse among policymakers and experts in the field of teaching Ethics to Filipino college students. This paper argues that the sense of urgency in the issue of the proposal to remove Ethics from the General Education Curriculum demands a timely discourse before moving to restructure democracy as Young had suggested.

Keywords: *Ethics, Powerlessness, Oppression, Communicative Democracy, Discourse*

Category A (Graduate/Professional)

SELF-REGULATED LEARNING STRATEGIES, ENGAGEMENT, AND GRAMMAR COMPETENCE OF SENIOR HIGH SCHOOL LEARNERS

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Liceo de Cagayan University

This study investigated the relationship between self-regulated learning strategies, classroom engagement, and grammar competence among senior high school students. Using a quantitative approach, data were gathered through survey questionnaires and grammar assessment tools. The findings revealed that students generally applied self-regulated learning strategies, with the highest mean scores observed in the area of monitoring, followed by evaluating and planning. In terms of engagement, cognitive and affective engagement scored higher compared to behavioral engagement, indicating students' mental effort and emotional investment in grammar learning. The grammar competence of the respondents was found to be at a good level, with students performing best in verb tenses and encountering more difficulties in subject-verb agreement and prepositions. Correlation analysis showed a small but significant positive relationship between grammar competence and components of self-regulated learning strategies (planning, monitoring, and evaluating), as well as cognitive and emotional engagement. Multiple regression analysis identified planning and monitoring as significant predictors of grammar competence, with monitoring emerging as the strongest predictor. The results suggest that learners who are goal oriented and actively track their learning progress are more likely to achieve higher levels of grammatical proficiency. These findings highlight the critical role of self-regulation and engagement in enhancing grammar instruction and call for the integration of these strategies into language teaching practices.

Keywords: *Grammar competence, self-regulated learning strategies, classroom engagement*

Category A (Graduate/Professional)

LANGUAGE LEARNING STYLES, TEACHER FEEDBACK, AND PUBLIC SPEAKING ANXIETY OF GRADE 11 STUDENTS

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Public speaking anxiety (PSA) remains a prevalent challenge among senior high school students, often influenced by individual learning preferences and the quality of teacher feedback. This study aimed to determine the preferred language learning styles of Grade 11 HUMSS students at Liceo de Cagayan University–Senior High School, assess the level of teacher feedback they receive, measure their PSA, and examine the relationships among these variables. A predictive-correlational design was employed using survey questionnaires administered to 216 students. Descriptive statistics, Pearson correlation, and multiple regression analysis were used in data treatment. Findings revealed that auditory and visual learning styles were most preferred, while teacher feedback was consistently rated high across formative, summative, and reflective dimensions. Public speaking anxiety was also found to be high. Significant relationships were identified between PSA and both learning styles and teacher feedback, with visual learning emerging as the strongest predictor. The study concludes that mismatched instructional strategies may intensify PSA, highlighting the need for differentiated, multimodal teaching approaches tailored to students' dominant learning styles to enhance speaking performance and reduce anxiety.

***Keywords*:** *public speaking anxiety, language learning styles, teacher feedback, senior high school, multimodal instruction*

Category A (Graduate/Professional)

TANGUB CITY'S LOCAL WATER GOVERNANCE: AN ASSESSMENT ON POLICY IMPLEMENTATION

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Good water governance is essential for establishing water security, managing water resources properly, and preventing conflicts in society that is why there is a need for policy assessment in order to assess and evaluate whether policies are well implemented or not. Moreover, this paper investigated water governance in Tangub City by evaluating and assessing existing statutes using the concepts of policy implementation and the major concepts of good governance. The study's respondents were a total of 256 representatives of water consumers in Tangub City and key informants from Tangub City Water District for the interview. This paper used a concurrent mixed method and analyzed the data using triangulation data analysis of survey results, key informant interviews, and researcher's observations. The paper revealed that water-related statutes in Tangub City had not yet been fully implemented. Moreover, the water service provider in the locality, as a government-owned and controlled corporation, finds difficulties in implementing such as in financial and local coordination. Therefore, to intervene with the problem of implementation, this paper suggests that better coordination and cooperation between national and local agencies and stakeholders could lead to reduction in lapses in implementation of water-related policies and it also suggests that financial assistance from national agencies or lending institutions could play a key role in helping alleviate and intervene with the problem of policy implementation.

Keywords: *Policy, Implementation, Water Governance, Governance, National, Local*

Category A (Graduate/Professional)

JOB SECURITY, ORGANIZATIONAL COMMITMENT, AND WORK ENGAGEMENT AMONG THE EMPLOYEES OF MSU-BUUG

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One of the keys towards organizational success is to have committed, engaged, and productive people. The main objective of the study is to explore the relationship of job security, organizational commitment, and work engagement as perceived by the employees. The study used descriptive-quantitative method of gathering and analyzing the data. It was conducted among the 88 employees of Mindanao State University-Buug Campus using an adopted questionnaire. The data were analyzed through the use of Pearson's Product Moment Correlation (Pearson r) to know the relationship of the variables. The study revealed the following findings: (1) the respondents are "secured" with their job, "committed" to the organization, and "highly engaged" to their work; (2) there is a highly significant relationship and demonstrated a strong positive correlation between job security and organizational commitment with a Pearson Correlation (r) coefficient of 0.657 and a p-value of <0.001; (3) there is a highly significant relationship and demonstrated a strong positive correlation between job security and work engagement with a Pearson Correlation (r) coefficient of 0.540 and a p-value of <0.001; and, (4) there is a highly significant relationship and demonstrated a strong positive correlation between organizational commitment and work engagement with a Pearson Correlation (r) coefficient of 0.743 and a p-value of <0.001. This implies that an employee who is secured with his/her job is expected to be committed and engaged at work. As such, the organization should provide a secure working condition and employment security to have a highly committed and highly engaged workforce.

Keywords: *job security, organizational commitment, work engagement, motivation*

Category A (Graduate/Professional)

POSITIONING THE PETITIONER AND THE VICTIM: AN ANALYSIS OF SUPREME COURT DECISIONS ON CHILD ABUSE CASES

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The power of law is exercised through language, as it functions as an important medium through which justice is defined and delivered. This study examined how the petitioners and the minor victims are constructed through legal discourse, revealing the underlying legal norms and power dynamics. Using the lens of Critical Discourse Analysis, the study analyzed five (5) court decisions issued by the Second Division of the Supreme Court of the Philippines, all involving violations under Section 10 (a) of Republic Act No. 7610 also known as "Special Protection of Children Against Abuse, Exploitation and Discrimination Act". Following the framework of Norman Fairclough's Three-Dimensional Model, which comprises textual analysis, discursive practice, and social practice, the analysis delved into the linguistic features, representational strategies, and broader institutional and societal ideologies that influence the portrayal of social actors within court decision. The findings revealed that petitioners in the five cases are consistently constructed as active agents of violence and negatively evaluated through various discursive strategies, whereas the minor victims are portrayed as passive, emotionally burdened, yet morally credible and positively appraised. The prominence of petitioners' negatively evaluated voice over the minor victims suggest an ideological pattern of the court when dealing child abuse cases.

Keywords: *Child Abuse, Critical Discourse Analysis, Power Dynamic, Ideology, Legal Discourse*

Category B

(High School/Undergraduate)

ABSTRACTS

Category B (High School/Undergraduate)

TEACHERS' LIVED EXPERIENCES IN SELF-CONTAINED CLASSROOM: CHALLENGES AND STRATEGIES IN TEACHING STUDENTS WITH SPECIAL NEEDS

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This study examined teachers' lived experiences in a self-contained classroom, challenges, and strategies. A Transcendental Phenomenological research design was employed. Researchers used purposeful sampling to select 12 self-contained special education teachers around Cagayan de Oro in the school year 20245-2025 and administered validated interview questionnaires to collect data. Utilizing Stevick-Colaizzi's approach by incorporating Keen's thematic analysis process. The simplified SCK method includes the following steps: Bracketing, Horizontalizing, Clustering, Textural Description, Structural Description, Composite Description, and Verification. Findings revealed that teachers undergo significant professional growth while facing ongoing challenges. Many enter the field through personal connections or unexpected circumstances and initially feel uncertain but develop a strong sense of purpose. Their roles require adaptability, emotional resilience, and reflective practice to meet diverse student needs. However, systemic limitations such as inadequate resources, limited specialized training, and insufficient institutional support create ongoing obstacles. These challenges, compounded by emotional strain and limited career advancement, can lead to burnout and high turnover rates. Despite these barriers, teachers find collaboration with colleagues and opportunities for professional reflection are essential for effective instruction and personal fulfillment. The study underscores the need for comprehensive training, better resource allocation, and enhanced collaboration to support teachers and students in special education settings.

Keywords: *Self-contained classroom, Experiences, Challenges, Strategies*

Category B (High School/Undergraduate)

BEHIND THE SCANNERS: LIVED EXPERIENCES OF PERSONS WITH DISABILITY (PWDS) WORKING AS MALL X-RAY OPERATORS

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With the rise of inclusivity, many minority groups, including PWDs, get to enjoy the same benefits and opportunities as everyone else. While PWDs still have less employment opportunities due to ongoing stereotypes, employment figures of PWDs in various sectors are rising. One such sector is the security sector, where having an experience of dealing with different kinds of people is crucial. In order to properly accommodate for the rise of the employment of PWDs, it is important to understand their experiences during employment. This study aimed to investigate the lived experiences of PWDs working as mall X-ray operators, specifically working at KCC Mall of Gensan. The study utilized the snowball sampling technique to select six (6) PWD mall X-ray operators. The data was collected via a face-to-face individual semi-structured interview, which was then transcribed to undergo thematic analysis. Results of this study have shown that work as a PWD mall X-ray operator focused around the safety of the mall and collaboration with guards. These show that PWDs can be dedicated to their roles in their jobs. While PWD mall X-ray operators enjoyed a sense of inclusion in their workplace, discrimination still is apparent from customers. To accommodate and assist them, accommodations in place such as incentives and crisis support were put in place by KCC. Employment as X-ray operators also help them feel empowered by raising self-confidence, proving capabilities, helping them become financially independent, and overcoming prejudices. These experiences highlight the current environment of working as a PWD as an X-ray operator. The researchers recommend various actions such as expanded support for PWDs in malls and more comprehensive incentives for PWDs.

Keywords: *persons with disability, X-ray operator, inclusivity, employment of PWDs, discrimination*

Category B (High School/Undergraduate)

GARBAGE PAWTECTOR: FOLDABLE BARRIER FOR SECURE AND ANIMAL-RESISTANT WASTE MANAGEMENT

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Stray animals scavenging through poorly secured garbage bins frequently cause problems to urban waste management in urban areas, including Barangay Lapasan in Cagayan de Oro City. To address these problems, this study presents the Garbage PAWtector Bin, a collapsible, animal resistant garbage container. The research employed a qualitative-descriptive method, gathering insights from residents through surveys to understand current waste management challenges and assess user receptiveness to the proposed design. The bin is engineered using lightweight yet durable materials and incorporates features like a reinforced lid and secure locking system to prevent intrusion by stray animals. Its collapsible shape also guarantees portability and easy storage, which enhances household convenience. The results show that the community is very supportive and willing to embrace the bin since they see how it can reduce waste disposal, lessen environmental risks, and enhance the aesthetics of urban areas. According to the study's findings, the Garbage PAWtector Bin is a workable solution that complements regional environmental objectives and provides a practical answer to a prevalent urban problem. Its use might act as a template for other highly populated areas dealing with comparable issues related to animal control and waste containment.

Keywords: *Environmental protection, animal-resistant, stray animals, urban sanitation, waste management*

Category B (High School/Undergraduate)

BALANCING PRECISION AND FEASIBILITY:
OPTIMIZING SAMPLE SIZES THROUGH POWER ANALYSIS

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Sample size plays a crucial role in the accuracy and reliability of statistical analyses, directly influencing the ability to detect meaningful effects. This study examines power analysis across Independent Samples, Paired Samples, and One Sample t-tests, determining the minimum sample size required to achieve 90% statistical power for detecting an effect size of 0.5 at $\alpha = 0.05$. Findings reveal that Independent sample t-tests necessitate 86 participants per group, while Paired and One Sample t-tests require 44 participants for robust effect detection. The analysis highlights that smaller sample sizes reduce sensitivity to true effects, increasing the likelihood of missing meaningful differences. Power contour and curve visualizations demonstrate the trade-off between sample size and effect detection, reinforcing the importance of statistical precision in experimental design. This study offers critical insights into optimizing sample size selection to ensure accurate, reliable, and statistically valid conclusions.

Keywords: *sample size, statistical power, effect detection, experimental accuracy, t-tests*

Category B (High School/Undergraduate)

SOLAR-POWERED DESALINATION: A COST-EFFECTIVE SOLUTION FOR CLEAN DRINKING WATER IN BARANGAY MACABALAN

Christian James B. Sayson, Shanine Kristel Hinaut, Angel Jackiesha Moraga, John Mark Salido, Keira Faith Saraos, Mary Hyacinth Zamora, and Maria Angeles Hinosolango
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Access to clean drinking water remains a pressing issue in many coastal communities, including Barangay Macabalan in Cagayan de Oro City. Traditional desalination methods are often costly and energy-intensive, making them impractical for small or low-income areas. This study explores the possibility of creating a cost-effective and environmentally friendly solar-powered desalination system. The system was designed and tested to convert seawater into potable water using solar energy, eliminating the need for electricity or expensive machinery. Community interviews revealed significant water access challenges, including unreliable supply, high dependence on commercial water refilling stations, and poor water quality. These findings shaped the design of the prototype to prioritize affordability, simplicity, and off-grid functionality, making it more suitable for everyday use in resource-limited settings Field testing of the prototype showed that out of 5 liters of seawater input, 1 liter evaporated under natural sunlight, yet only 50 milliliters of distilled water was recovered due to design limitations such as vapor leakage. Despite the low yield, the test demonstrated proof of concept that drinkable water can be produced using a passive solar-based system. The collected water met most local and international standards for potability. The prototype requires further optimization to improve water recovery efficiency, but it already meets core community needs by being low-cost, low-maintenance, and electricity-free. Overall, solar-powered desalination presents a viable and scalable solution for addressing water scarcity in underserved coastal areas, and further development could significantly enhance its impact and practicality.

Keywords: *Solar Desalination, water shortage, renewable energy, coastal communities, clean water solution*

Category B (High School/Undergraduate)

ASSESSMENT OF BAT *(chiroptera)* MORPHOLOGY AND DIVERSITY IN THREE BARANGAYS (PATAG, MAPULOG, AND TAGBALOGO) OFNAAWAN, MISAMIS ORIENTAL, PHILIPPINES

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This study assessed the diversity, population size, and density of Chiroptera speciesin the barangays of Patag, Mapulog, and Tagbalogo in Naawan, Misamis Oriental, usingadescriptive mixed-method research design. Field sampling conducted in March 2025documented a total of 76 individual bats representing eight species, all belonging to the familyPteropodidae. These included both common and vulnerable species such as Ptenochirusjagori, Cynopterus brachyotis, and Eonycteris robusta. Morphological measurements wererecorded and found to align with standard Southeast Asian references. Diversity analysisusing PAST software (v4.03) showed that Mapulog had the highest species richness (8 taxa), followed by Patag (6 taxa), and Tagbalogo (4 taxa). Ptenochirus jagori was the most abundant species, comprising 43.42% of all captures. A complementary survey of 98community respondents revealed high general awareness of forest and bat conservation, although knowledge gaps and misconceptions remain. Respondents expressed strongconservation-oriented attitudes but identified human-induced threats such as pesticide use, pollution, and deforestation. Despite some local initiatives, weak policy enforcement andlimited awareness hinder effective bat conservation. These findings highlight the need for targeted education and strengthened community-based conservation efforts.

Keywords: *Bat diversity, Morphological measurements, Population density, Chiroptera*

Category B (High School/Undergraduate)

TREE SPECIES DIVERSITY AND CARBON STOCK IN THE RESTRICTED ZONE OF CUGMAN-CATANICO FOREST RESERVE, MALASAG HEIGHTS, CAGAYAN DE ORO CITY

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Forests play a crucial role in mitigating climate change by acting as natural carbon sinks, with trees absorbing atmospheric CO2 and reducing global warming. This study aimed to assess species diversity and estimate carbon stock in the Cugman- Catanico Forest Reserve. Biomass is estimated using allometric equations, while carbon stocks are calculated using standard carbon factors. The Diversity Index (H' 2.056) indicates moderate species diversity, with Site 1 exhibiting the highest evenness (E' = 0.4339). However, the overall low evenness and a Simpson's Index of D = 0.1643 reveal dominance by a few species. Among the surveyed trees, Mahogany (Swietenia macrophylla) contributed 93.05 Mg C/ha of carbon stock, while Teak (Tectona grandis) yielded 92.22 Mg C/ha, and Mangium (Acacia mangium) recorded 74.28 Mg C/ha these species contributed most significantly to the total carbon stock. The total aboveground biomass across all 18 surveyed species reached 842.02 Mg/ha, with an overall carbon stock of 421.01 Mg C/ha, with market valuations amounting to PHP 1,989,269,69/ha in the voluntary market and PHP 6,321,467.63/ha in the regulatory market. While the forest presents significant potential for climate finance, overreliance on invasive, high-biomass species threatens biodiversity. Thus, ecological restoration including native species propagation, invasive control, and soil rehabilitation is critical. Integrating these strategies ensures environmental sustainability and economic viability, positioning the reserve as a model for balanced forest management.

Keywords: *climate change, tree species diversity, aboveground biomass, carbon stock, market value*

Category B (High School/Undergraduate)

INFLUENCE OF TIKTOK USAGE ON ENGLISH LANGUAGE PROFICIENCY AMONG JUNIOR HIGH SCHOOL STUDENTS

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This study explored the influence of TikTok usage on the English language proficiency of Grade 7 students at an Integrated School in Villanueva, Misamis Oriental, Philippines. Specifically, it examined how students' frequency of use, purpose of usage, and engagement in English-language activities on TikTok relate to their proficiency in vocabulary, grammar, and reading comprehension. Using a descriptive-correlational research design, the study employed total population sampling involving 159 junior high school students. A validated and reliable questionnaire was used to collect data, including adapted items from standardized English proficiency assessments. Descriptive statistics revealed that most students use TikTok primarily for entertainment, with limited engagement in educational English-language content. The results showed that the majority of students demonstrated low proficiency levels in grammar and reading comprehension. Spearman correlation analysis indicated no statistically significant relationship between TikTok usage patterns and English language proficiency. Additionally, ANOVA results showed no significant difference in vocabulary scores based on the purpose of TikTok usage. These findings conclude that while TikTok can serve as a platform for incidental exposure to English, it cannot be considered an effective standalone tool for improving English language skills. The study recommends the guided use of educational TikTok content to supplement classroom instruction and further research on structured digital interventions that can positively impact language learning in formal education settings.

Keywords: *Engagement, English Language Proficiency, Grammar, Reading Comprehension, TikTok Usage*

Category B (High School/Undergraduate)

THE INFLUENCE OF ORGANIZATIONAL CULTURE AND INDIVIDUAL RESILIENCE ON THE JOB PERFORMANCE AMONG SELECTED HOTEL EMPLOYEES IN CAGAYAN DE ORO CITY

Verla Nena Taal Danuco
Capitol University

Leading hospitality establishments thrive by fostering a quality-centered culture, with a collective commitment to quality management enhancing overall performance. Organizational culture evolves dynamically through intentional nurturing or natural development. This study examined the influence of organizational culture and individual resilience on job performance among hotel employees in Cagayan de Oro City using a descriptive correlational design. Descriptive statistics (frequency, percentage, mean, and standard deviation) and inferential statistics (ANOVA, Pearson R) assessed relationships between variables. Multiple regression analysis examined the combined influence of organizational culture and individual resilience on job performance. Findings revealed a strong alignment of organizational cultures with stated values, emphasizing teamwork and effective communication. This fosters employee trust, integrity, and authenticity, contributing to cohesive service delivery and heightened guest satisfaction. However, a need for consistent and timely recognition practices was identified to bolster employee morale and engagement. High levels of resilience among hotel employees, characterized by endurance, adaptability, and courage, positively influenced job satisfaction, motivation, and organizational commitment. Cultivating a culture that supports resilience and continuous learning can enhance employee engagement and overall performance. The research concluded a strong correlation between organizational culture and individual resilience, particularly in communication patterns, collaborative efforts, and shared values. Organizational culture significantly shapes employee resilience levels, with adaptability emerging as a critical predictor of job performance. Enhancing resilience factors through targeted training and development is essential for sustaining high productivity in dynamic hospitality environments.

Keywords: *organizational culture, individual resilience, job performance, hotel employees, influence, work environment*

Category B (High School/Undergraduate)

THE ROLE OF ENGLISH-LANGUAGE ENTERTAINMENT EXPOSURE IN DEVELOPING ENGLISH READING COMPREHENSION SKILL

Raponzel B. Gesta and Fresy Mae B. Paguya
Tagoloan Community College

This study explored the role of English-language entertainment exposure—specifically video content and music—in the development of English reading comprehension skills among first year Bachelor of Secondary Education (BSED) English students at Tagoloan Community College. Recognizing the relevance of reading comprehension in academic success, the study addressed whether frequent exposure to English-language videos and music supports comprehension development. Utilizing a descriptive-quantitative design, data were collected through a validated researcher-made questionnaire, administered to 117 students using a census approach. The study assessed two main variables: the frequency of English-language entertainment exposure and the students' level of reading comprehension skill. Statistical tools such as weighted mean and Spearman's Rank Correlation were employed in the analysis. Findings revealed that students were frequently exposed to both video and music content in English, engaging with them on a "daily or almost daily" basis. Despite this high level of engagement, the results indicated no significant correlation between English-language entertainment exposure and reading comprehension skill ($\rho = 0.057$ for video; $\rho = 0.080$ for music; $p > 0.05$). These results suggest that while English-language entertainment can supplement language learning, it may not directly enhance reading comprehension in isolation. The study concludes that structured reading practices and instructional support are necessary to develop comprehension skills. It recommends integrating entertainment exposure with formal learning strategies to maximize its educational value.

Keywords: *English-language entertainment, music exposure, video content, reading comprehension, media-based learning, language acquisition*

Category B (High School/Undergraduate)

ECHOES OF IDENTITY: A LINGUISTIC FEATURE ANALYSIS OF EL SALVADOR CITY HYMN

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City College of El Salvador

This study examined the El Salvador City hymn, "Tagnipan-ong Paraiso," to understand its linguistic features and how it reflects the city's identity, values, and historical context. Data was collected through textual analysis of the hymn's lyrics and interviews with the composer. Questionnaires were administered to various stakeholders, including LGU officials, students, and locals, to gather their perspectives on the hymn's meaning and significance. Analysis revealed the hymn employs poetic devices, cultural references, and religious imagery to convey its message. Key themes include the city's natural beauty, ancestral heritage, faith, progress, and civic pride. The study found that the use of the Cebuano language in the hymn enhances its accessibility and cultural significance for the local community. The composer's emphasis on Cebuano reflects a conscious decision to connect with the local audience and promote cultural identity. The hymn's message of unity, progress, and devotion to the city resonates with residents and serves as a powerful symbol of their shared identity and aspirations.

Keywords: *hymn, linguistic features, poetic devices, El Salvador City*

Category B (High School/Undergraduate)

SOCIO-ECONOMIC ANALYSIS OF CACAO FARMERS IN THE PROVINCE OF SOUTH COTABATO

Rupert Lee G. Fano and Honey Grace C. Sario
South Cotabato State College

This study explores the socioeconomic conditions of farmers engaged in the cacao industry, aiming to understand how cacao cultivation influences their livelihoods and economic stability. Cacao is a valuable cash crop with growing demand both locally and internationally, offering promising opportunities for rural development. However, farmers often face numerous challenges that hinder their productivity and income. Using a mixed-methods approach, the research involved surveys and interviews with cacao farmers in South Cotabato, allowing for both quantitative and qualitative data analysis. Key indicators such as household income, access to agricultural inputs, market linkage, land ownership, and educational attainment were examined to evaluate the overall impact of cacao farming on the socioeconomic status of the respondents. The results reveal that while cacao farming contributes positively to household income, many farmers remain vulnerable due to fluctuating market prices, limited access to capital and training, and inadequate government support. Additionally, factors such as land tenure insecurity and low adoption of modern farming techniques further constrain the potential of the industry. The study emphasizes the need for more inclusive and farmer-centered policies, capacity-building initiatives, and investment in infrastructure to improve productivity and ensure sustainable income for cacao growers. Strengthening farmer cooperatives and enhancing market access are also identified as key strategies to uplift the socioeconomic status of cacao farmers. Overall, the research provides valuable insights for stakeholders aiming to promote inclusive growth within the cacao industry.

Category B (High School/Undergraduate)

KAGAY-ANON CIVIC CENTER: A PROPOSED INTEGRATED HUB OF GOVERNANCE, COMMUNITY, AND ECONOMY FOR METRO CAGAYAN DE ORO

Kristine Delle P. Lagumbay and Archemedes G. Wabe
University of Science and Technology of Southern Philippines

The development of the Kagay-Anon Civic Center: A Proposed Integrated Hub of Governance, Community, and Economy for Metro Cagayan De Oro envisions a dynamic space that addresses the evolving needs of a growing urban population of Metropolitan Cagayan de Oro. This project aims to set a benchmark for civic spaces across the country by fostering a centralized, multifunctional complex that enhances public accessibility and community engagement. Designed to be a people-centered facility, the civic center will feature spaces that encourage participation, collaboration, and inclusivity, ensuring that citizens from diverse backgrounds feel represented and involved. By incorporating walkable public areas, open spaces for gatherings, and facilities for cultural, social, and economic activities, the project promotes civic pride and unity. Furthermore, the civic center is anticipated to boost economic activity by providing spaces for small businesses, entrepreneurial ventures, and community-driven initiatives, positioning itself as a catalyst for local growth and development. By emphasizing accessibility, community involvement, and economic opportunity, the Kagay-Anon Civic Center aims to foster a vibrant and inclusive urban hub for the future of Metro Cagayan de Oro.

Category B (High School/Undergraduate)

FACTORS INFLUENCING OCCUPATIONAL STRESS ON THE JOB PERFORMANCE OF BFP PERSONNEL IN SELECTED MUNICIPALITIES OF MISAMIS ORIENTAL

Earl Jay Cailing, Christine Mae Cupat, Nor Ain Dimatinday Mabel Galarpe,
and Nelpha Joy Panoy
Initao College

This study investigates the factors contributing to occupational stress among personnel of the Bureau of Fire Protection (BFP) and examines how these stressors affect their job performance in selected municipalities of Misamis Oriental. Employing a quantitative research design, data were collected through structured survey questionnaires administered to BFP personnel across various municipalities. The findings reveal that organizational factors are the primary contributors to occupational stress, significantly affecting key aspects of job performance such as emergency response time and decision-making efficiency. Interestingly, the analysis showed no significant differences in stress levels when grouped by demographic variables, including sex, age, and length of service. Moreover, occupational stress was found to have a negative impact on overall job satisfaction, emphasizing the urgent need for strategic interventions. This study highlights the critical importance of implementing comprehensive stress management programs to improve the well-being, effectiveness, and job satisfaction of BFP personnel. Addressing organizational stressors through policy reform, training, and support mechanisms can enhance performance in emergency situations. The research offers meaningful insights into the unique challenges faced by emergency responders and fills a gap in the existing literature. It recommends that the BFP institutionalize stress management initiatives and that local government units (LGUs) allocate adequate resources to support frontline personnel.

Keywords: *Bureau of Fire Protection, Occupational Stress, Job Performance, Emergency Response, Stress Management*

Category B (High School/Undergraduate)

THE IMPACT OF INTERNATIONAL TOURISM TO THE ECONOMIC GROWTH IN SELECTED SOUTHEAST ASIAN DEVELOPING COUNTRIES

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Gingoog City United Colleges

This research examines the effect of international tourism on economic growth in the selected developing countries in Southeast Asia, which are Indonesia, Laos, Myanmar, Vietnam, Cambodia, the Philippines, Malaysia, and Thailand, from 2002 to 2020. Utilizing panel data analysis, the research utilizes gross domestic product (GDP) as the dependent variable and international tourism receipts and international tourism expenditure as the independent variables. The analysis identified foreign direct investment, the exchange rate, and inflation as control variables influencing gross domestic product. The findings indicate that international tourism receipts, international tourism expenditures, and FDI are statistically insignificant but positively related to economic growth, while the inflation rate shows a statistically significant and positive relationship with GDP. The exchange rate, however, shows a negative and insignificant relationship with GDP. Even though the results show that international tourism and foreign direct investment are important for economic growth in the region, the evidence isn't strong enough to clearly prove their effect, thereby precluding any claim of a statistically robust tourism-led growth effect for the selected Southeast Asian countries. Collectively, the findings, although weak, do confirm the Keynesian Economic Growth Theory. The selected developing Southeast Asian countries should prioritize investments in sustainable tourism infrastructure, diversify their economies, and improve workforce skills to decrease reliance on tourism. This should include strengthening policies that promote innovation, digital modernization, and stable macroeconomic conditions, all of which can further boost long-term economic growth.

Keywords: *International tourism indicators, Southeast Asia, panel data model, Gross Domestic Product*

Category B (High School/Undergraduate)

DETERMINING THE DISTINCTIVE FEATURES OF THE UMAJAMNĒN TRIBE TO RECOGNIZING TRIBAL IDENTITY

Crystal Mae G. Apus, Mark Cabrera, James A. Magpili, and Joemar A. Namata
City College of El Salvador

Umajamnèn tribe is one of the tribal communities in far-flung areas in Cabanglasan, Bukidnon which is less explored due to its geographical location and its similarity to the Umayamnon tribe. This study aims to discover the distinctive features of the Umajamnèn tribe through their cultural domains, particularly in the concept of rituals, semiotic artifacts, offerings, and movements to answer the long-held misconception that Umajamnèn and Umayamnon are the same. Using the qualitative ethnographic method, data was drawn through interviews of the datu, bae, and Binhi tè Paglaum scholars. Observation and documentation during the welcoming rituals were employed also to get the facts needed. Findings reveal that Umajamnèn rituals used a variety of semiotic artifacts to connect the spiritual and physical world. These artifacts are regarded as lugbak (offerings) such as sapi (money), agkud (traditional wine), timusog (bronze bracelet), and anything that they could offer(food or things that are valuable to them) together with inapugan, mānok or pig. All of these are placed in uwagdëk commonly known as an altar for the Dumagat people. Another finding, the Datu or Baylan is considered accountable in leading to pray to ask Mababaja their God to protect and guide them together with the attendees of the ritual. Through pig or chicken's blood, it cleanses and casts away the bad spirit to protect the people in the community. This research contributes to the broader discourse on Indigenous identity and cultural preservation to safeguard the heritage of the Umajamnon tribe. Recognizing their distinct identity can support initiatives for cultural sustainability and rightful acknowledgment by national institutions.

Keywords: *Umajamnon, Cultural Domain, Cabanglasan-Bukidnon, Rituals, Timusog*

Category B (High School/Undergraduate)

ECONOMIC GROWTH AT THE EXPENSE OF ENVIRONMENTAL DEGRADATION: EVIDENCE FROM THE ASEAN COUNTRIES 1993-2020

Decery Baticaros, Ferdielyn Demetillo, Ruby Ann Estolonio, Evander Gatasi, and Nilmae M. Palpagan
Gingoog City United Colleges

The ASEAN region has experienced significant economic growth over the last few decades. Environmental degradation often seems unavoidable in developing regions, where countries are either beginning or progressing toward development. As these countries pursue economic growth and related activities, high energy consumption becomes essential. This study aims to determine the effects of economic growth at the expense of environmental degradation. This study used panel regression and conducted several diagnostic tests to ensure the assumptions of the Pooled Ordinary Least Squares (OLS) method were satisfied. The results shows that log GDP has a significant and positive relationship with carbon emissions, it is supported by the Environmental Kuznets Curve (EKC) theory, that economic growth contributes to pollution. In contrast, foreign direct investment (FDI) and urban population show negative association with carbon emissions, signifcant at 5%. These variables suggest on how to reduce environmental harm, possibly through the adoption of eco-friendly technologies, enhancement of infrastructure supported by strong institutions and policies. The study's implications are helpful for policymakers especially for striving to balance economic development and environmental protection. Through promoting renewable energy, green technologies, and enforcing environmental regulations can help mitigate emissions. This research provides insights for ASEAN countries to achieve sustainable growth without compromising environmental quality.

Keywords: *ASEAN, Carbon Emissions, Environmental Degradation, Environmental Kuznets Curve, Gross Domestic Product, Panel Regression*

Category B (High School/Undergraduate)

SOCIO-ECONOMIC ANALYSIS OF CACAO FARMERS IN THE PROVINCE OF SOUTH COTABATO

Rupert Lee G. Fano and Honey Grace C. Sario
South Cotabato State College

This study explores the socioeconomic conditions of farmers engaged in the cacao industry, aiming to understand how cacao cultivation influences their livelihoods and economic stability. Cacao is a valuable cash crop with growing demand both locally and internationally, offering promising opportunities for rural development. However, farmers often face numerous challenges that hinder their productivity and income. Using a mixed-methods approach, the research involved surveys and interviews with cacao farmers in South Cotabato, allowing for both quantitative and qualitative data analysis. Key indicators such as household income, access to agricultural inputs, market linkage, land ownership, and educational attainment were examined to evaluate the overall impact of cacao farming on the socioeconomic status of the respondents. The results reveal that while cacao farming contributes positively to household income, many farmers remain vulnerable due to fluctuating market prices, limited access to capital and training, and inadequate government support. Additionally, factors such as land tenure insecurity and low adoption of modern farming techniques further constrain the potential of the industry. The study emphasizes the need for more inclusive and farmer-centered policies, capacity-building initiatives, and investment in infrastructure to improve productivity and ensure sustainable income for cacao growers. Strengthening farmer cooperatives and enhancing market access are also identified as key strategies to uplift the socioeconomic status of cacao farmers. Overall, the research provides valuable insights for stakeholders aiming to promote inclusive growth within the cacao industry.

Category C

(Innovation Overview)

Category C (Innovation Overview)

GUARDIANS OF THE GROUND: THE SOIL SENTINEL DROUGHT DETECTIVE AGAINST DRY DISASTER

Carla Katrina P. Adajar, Gly Cynthia D. Ellevera, Rechel Ann R. Reoja
Danao National High School

In response to the escalating challenges of soil degradation and drought, Guardians of the Ground: The Soil Sentinel Drought Detective introduces a low-cost, Arduino-based early warning and monitoring system tailored for vulnerable agricultural communities. Anchored on SDG 15: Life on Land, the innovation targets dry-prone areas like Barangay Danao, Misamis Oriental, by providing real-time data on soil moisture and environmental conditions to empower timely intervention. Using sensors, local calibration, and a buzzer alert system, the device detects drought-like soil conditions and supports soil conservation through practical recommendations. The research adopted an experimental-developmental design to assess the functionality, accuracy, and socio-environmental relevance of the system. Results from field testing confirmed its reliability in distinguishing varying soil moisture levels and issuing timely alerts. The expected outcomes include improved drought preparedness, enhanced agricultural productivity, and contributions to climate resilience and disaster risk reduction. By promoting absolute sustainability through "sticking to one's environmental share," this project showcases how youth-led, data-driven innovations can address pressing global challenges in a localized, accessible manner.

FROM WEED TO WEALTH: HAGONOY PLANT UTILIZATION FOR SUSTAINABLE DEVELOPMENT

Althea Chloe G. Yusi, Chloe Nicole D. Bangcong, Laurence A. Bayhon,
Danao National High School

From Weed to Wealth: Hagonoy Plant Utilization for Sustainable Development presents an innovative response to the ecological and economic challenges posed by the invasive Chromolaena odorata, locally known as Hagonoy. Recognizing its abundance and nuisance to local agriculture and biodiversity, this project transforms the problem into a solution by exploring the plant's potential as a source of alternative medicine, insect repellent, and eco-friendly materials such as paper and packaging. Aligned with Sustainable Development Goals (SDGs) 12 (Responsible Consumption and Production), 13 (Climate Action), and 15 (Life on Land), the initiative adopts a scientific-experimental approach to validate the efficacy and usability of Hagonoy-based products. Early trials demonstrate promising antibacterial, insect-repelling, and biodegradable properties. The project empowers local communities by promoting sustainable livelihood opportunities and environmental conservation. By turning an environmental threat into a resource, this student-led innovation offers a low-cost, scalable model that blends ecological awareness with practical social impact—redefining sustainability through ingenuity, resourcefulness, and local action.

Category C (Innovation)

AN INVESTIGATION ON THE ADHESIVE PROPERTIES AND DURABILITY OF JACKFRUIT SAP REINFORCED WITH STYROFOAM PARTICLES AS A POTENTIAL SEALANT FOR STAINLESS STEEL SURFACES

Guillano, Marla Izabel B., Te, Arvy Jake B.Santiago, Hansel Ann D.
Kong Hua School

This study explores the innovative potential of combining jackfruit (Artocarpus heterophyllus) sap and recycled Styrofoam particles to develop an eco-friendly sealant for stainless steel surfaces. Addressing both plastic pollution and the demand for sustainable construction materials, the project aligns with Sustainable Development Goal 9—promoting resilient infrastructure and inclusive, sustainable industrialization. Utilizing gasoline as a solvent, the mixture was prepared, applied, and tested for adhesion, durability, and water resistance through a series of quantitative and qualitative assessments. Seven methodological phases, including regression and statistical analysis, guided the evaluation of its performance compared to commercial sealants. Results showed promising outcomes in terms of cost-effectiveness, environmental sustainability, and practical utility, especially for households in tropical regions vulnerable to frequent rainfall. Beyond its technical contributions, the project empowers local communities to utilize agricultural and household waste, showcasing how grassroots innovations can drive sustainable development.

DAWAT, LIMPYO: A FRESH TAKE — TURNING AN OLD NOTION INTO A NEW CALL FOR SUSTAINABLE ACTION

Nouf Aryaam T. Montud, Haile Xanthea A. Padillo, Nevaeh Novee G. Quilab
Mindanao State University - Iligan Institute of Technology

The “DAWAT, LIMPYO” innovation proposes an automated tray system to address the pressing issue of plastic waste in school canteens by replacing disposable food containers with reusable trays and cups. The system comprises a tray-pickup station and a multi-phase tray-returning station integrated with QR code scanners, automated dishwashing, and sterilization units. Rooted in the goal of promoting sustainable habits among students, the project aligns with SDG 11 (Sustainable Cities and Communities) and supports additional goals including SDG 3 (Good Health and Well-being), SDG 9 (Industry, Innovation and Infrastructure), SDG 12 (Responsible Consumption and Production), and SDG 13 (Climate Action). Through planned stages of design, prototype development, community testing, and system enhancement, the project aims to instill accountability, improve hygiene, reduce environmental impact, and promote scalability for wider adoption in educational institutions. If proven effective, this innovation has the potential to serve as a model for sustainable waste management in public facilities.

Category C (Innovation)

INVESTIGATING THE STRENGTH AND BIODEGRADABILITY OF PAPER BAGS FABRICATED FROM BANANA PSEUDOSTEM AND COCONUT FIBER: A SUSTAINABLE ALTERNATIVE FOR TRADITIONAL PACKAGING

Butch Marco D. Fiel, David Joaquin B. Nolasco, Cheiani C. Villahermosa
Kong Hua School

This study investigates the feasibility of using banana pseudostem and coconut fiber —abundant agricultural byproducts in Northern Mindanao—as raw materials for producing biodegradable paper bags. Motivated by the environmental impacts of single-use plastics, the research aligns with Sustainable Development Goals 12 (Responsible Consumption and Production) and 13 (Climate Action). Through an experimental research design, the team fabricated eco-friendly paper bags and subjected them to durability and water resistance tests. Results revealed that the prototype bags could carry up to 1.61 kg of weight and demonstrated superior moisture resistance compared to conventional paper bags. These findings affirm the potential of banana pseudostem and coconut fiber as practical, locally sourced alternatives to plastic packaging. By integrating environmental science, sustainability advocacy, and grassroots innovation, the project contributes to climate-conscious consumption practices and waste reduction in urban communities like Cagayan de Oro City.

AGRIDUINO: A SMART ARDUINO-BASED AQUAPONICS SYSTEM WITH REAL-TIME NUTRIENT TRACKING AND MOBILE-CONTROLLED SUPPLEMENTATION

Milka Sophia Mamac, Amira Nichole B. Nabong, Shalani Arabella L. Relativo
Gusa Regional Science High School - X

This study presents AgriDuino, an innovative, Arduino-based aquaponics system designed to enhance sustainable food production through real-time nutrient monitoring and automated supplementation. Integrating renewable energy sources —solar and micro-hydropower—alongside AI-assisted controls and a user-friendly mobile application, the system aims to optimize the growth of lettuce (Lactuca sativa) and bangus (Chanos chanos). The project directly supports Sustainable Development Goal 2: Zero Hunger by increasing agricultural productivity, improving resource efficiency, and ensuring consistent nutrient delivery. Performance is measured through biological indicators, system reliability metrics, and ICT standards. The findings promise a scalable, modular, and cost-effective model for resilient food production in resource-limited settings, making AgriDuino a practical tool for smallholder farmers and communities seeking food security and environmental sustainability.

Category C (Innovation)

DEVELOPMENT OF ECO-FRIENDLY INSULATING PANELS USING COCONUT COIR FIBER (COCOS NUCIFERA L.) AND BANANA PSEUDOSTEM FIBER (MUSA ACUMINATA) FOR SUSTAINABLE INDOOR CONSTRUCTION

Althea Beatrix C. Dag-um, Cyza Jane A. Odarve, Dolyn Vale Raniego
Gusa Regional Science High School - X, Junior High School

This project explores the fabrication of eco-friendly insulating panels by combining coconut coir fiber and banana pseudostem fiber, bonded with cassava starch, as a sustainable alternative to traditional insulation materials in indoor construction. Responding to the environmental impact of synthetic insulators, the study aims to reduce agricultural waste, lower greenhouse gas emissions, and promote resource efficiency by utilizing abundant yet underutilized local materials. The team conducted thermal conductivity, mechanical strength, and water absorption tests to evaluate performance against commercial standards. Results are expected to show that the panels provide sufficient insulation, structural integrity, and moisture resistance, while being biodegradable and cost-efficient. Aligned with SDG 9 (Industry, Innovation, and Infrastructure), this innovation also empowers rural farmers and supports localized green industry. Ultimately, the project offers a scalable solution for sustainable housing and educates communities on the value of ecological construction.

MAGNETECH: A MAGNETIC-BASED WATER TREATMENT SYSTEM FOR MICROPLASTIC SEPARATION

Jullian A. Pangan, Roda A. Patayon, Abigail M. Regala
Gusa Regional Science High School - X, Junior High School

This project introduces MagCLEAN, a portable and cost-efficient water filtration system designed to address water contamination by heavy metals, particularly in underserved and flood-prone communities. The system utilizes chitosan-modified magnetite (Fe_3O_4) nanoparticles, synthesized from crab shells and iron sulfate, to magnetically adsorb and remove lead (Pb^{2+}) ions from contaminated water. Using a single-factor experimental design, the research investigates the effect of nanoparticle dosage on the efficacy of metal ion removal. Characterization through UV-Vis spectrophotometry validates the system's filtration performance. The project aligns with SDG 6 (Clean Water and Sanitation) and SDG 13 (Climate Action), offering a sustainable and accessible solution for clean water access during disasters and water crises. The innovation emphasizes circular economy principles by transforming seafood waste into a value-added environmental product, combining nanotechnology, environmental science, and community-focused impact.

Category C (Innovation)

VAPEGUARDPRO: AN ARDUINO-BASED VAPE SMOKE DETECTION SYSTEM WITH AUTOMATIC IMAGE CAPTURE

Arnulfo Semitara Reyes Jr., Patrick James Bravo Indico, John Michael Salazar Catalan
Benigno “Ninoy” Aquino High School - Integrated SHS

The rise in vaping, particularly in no-smoking zones like schools and public institutions, presents a growing challenge for policy enforcement due to the near-invisibility and rapid dissipation of vape smoke. In response, this study introduces VapeGuardPro, an Arduino-based system equipped with real-time vape smoke detection and automated image capture capabilities. Integrating MQ-2 gas sensors, an ESP32-CAM module, and a TFT LCD display, the system identifies vape emissions, alerts nearby users via buzzer, and captures visual evidence for documentation. Experimental testing shows high detection accuracy (95%) for vape smoke with a rapid response time of two seconds, significantly outperforming detection of other smoke types like incense and steam. The system is designed to be low-cost, modular, and accessible, providing an effective and scalable tool for schools and offices seeking to maintain a vape-free environment. VapeGuardPro exemplifies the integration of open-source electronics and smart infrastructure for public health enforcement and aligns strongly with SDG 9: Industry, Innovation, and Infrastructure. By leveraging automation and digital technology, this innovation not only enhances environmental safety but also empowers young developers to apply STEM solutions to real-world issues.

HARDWATERVAULT: SMART SOIL MONITORING, SMART IRRIGATION, AND HARD WATER INTO WATER ENERGY HARVESTING SYSTEM

Ben Cymon A. Mendiola,tarala, John Noah Tarala, Jericho B. Manio
Benigno “Ninoy” Aquino High School - Integrated SHS

The HardwaterVault is an integrated innovation that combines smart agriculture and clean energy technology to address two major challenges in rural and agricultural communities: water management and sustainable energy. This system utilizes Arduino-based microcontrollers, soil moisture sensors, and a GSM relay switch to automate irrigation based on real-time soil conditions, reducing both water waste and manual labor. Uniquely, it also incorporates an energy-harvesting mechanism that converts hard water—a commonly underutilized resource—into electrical energy through ion interaction with electrodes. The dual-purpose design aims to mitigate issues such as flooding, inefficient irrigation, and limited access to electricity in far-flung areas. The project is aligned with multiple Sustainable Development Goals (SDGs), notably SDG 6 (Clean Water and Sanitation), SDG 7 (Affordable and Clean Energy), and SDG 15 (Life on Land). Its feasibility, low-cost implementation, and scalable framework make it a promising solution for both school-based research and community-level deployment. The HardwaterVault is not only an environmental solution but also an educational tool fostering interdisciplinary STEM learning.

Category C (Innovation)

A FACTORIAL EXPERIMENTAL STUDY ON THE WATER-RESISTANT ABILITY OF *LUFFA AEGYPTIACA* TREATED WITH NATURAL EXTRACTS AS AN ALTERNATIVE RAINCOAT MATERIAL

Althea Loraine D. Llantada, Kelvin Edison S. Reyes, Vince Julius I. Guimbungan
Bintawan National High School

This experimental study investigates the water-resistant potential of Luffa aegyptiaca (commonly known as loofah) as a sustainable alternative material for raincoat production. Utilizing a 2×3 factorial design, the researchers treated loofah sheets with various natural coatings—beeswax, coconut oil, and banana sap—to determine which combination yields the highest water resistance. Treatments were applied in single and double layers, and each sample was evaluated based on water absorption, material texture, and resistance to deformation. Results indicate that the double-coated loofah samples, particularly those treated with beeswax and coconut oil, significantly outperformed untreated samples in terms of water repellency and structural integrity. This suggests that Luffa aegyptiaca, a biodegradable and locally available plant fiber, when enhanced with eco-friendly coatings, has promising applications in sustainable fashion and weather-protective wear. The study supports environmental sustainability by reducing reliance on synthetic polymers and aligns with SDG 12 (Responsible Consumption and Production). Further research is recommended to test durability under prolonged exposure and scalability for commercial use.

AQUAPONIC-TOWER SYSTEM: DEVELOPMENT OF A VERTICAL IOT-ENABLED AQUAPONICS SYSTEM FOR LETTUCE CULTIVATION AND CATFISH REARING WITH REAL-TIME WEB MONITORING

Marchael Brenan N. Corpus, Rommel Jr. A. Rodriguez, Perland B. Pellerin
Benigno “Ninoy” Aquino High School - Integrated SHS

Urbanization has significantly reduced agricultural space in metropolitan areas, rendering traditional farming inefficient due to spatial and resource constraints. This paper presents the development of an IoT-enabled Vertical Smart Aquaponics System that integrates lettuce cultivation and catfish rearing within a compact, solar-powered framework. The system utilizes smart sensors (pH, temperature, and TDS) and an ESP32 microcontroller to monitor environmental variables and stream real-time data to a cloud-based dashboard, accessible via QR code. The vertical, modular design maximizes space efficiency, making it suitable for rooftops and compact urban lots. It also fosters community empowerment by promoting local food production, sustainability, and digital literacy. Educational deployment in schools and barangays integrates STEM learning with environmental stewardship. The innovation supports SDG 11 (Sustainable Cities and Communities) and SDG 9 (Industry, Innovation, and Infrastructure), offering a scalable model for sustainable, tech-driven agriculture in urban environments.

Category C (Innovation)

DUAL CONVERSION OF KITCHEN WASTE INTO BIOGAS AND FERTILIZER: A MODEL FOR SUSTAINABLE HOUSEHOLD WASTE MANAGEMENT

Troy Joshua B. Lapara, Jusril Vinz D. Lumagsao, Emmanuele Wayne P. Paster
Cagayan De Oro National High school- Senior High

The study proposes an innovative dual-purpose system that addresses both energy and agricultural needs through the conversion of household kitchen waste into biogas and organic fertilizer. Recognizing methane as a potent greenhouse gas, the project responds to environmental, economic, and social imperatives by offering a community-based solution to organic waste mismanagement. The system uses anaerobic digestion to produce biogas for cooking and repurposes the residual slurry as fertilizer, supporting both energy sufficiency and soil enrichment. It utilizes simple, low-cost materials such as plastic drums and PVC pipes to ensure affordability and replicability in various community settings. This innovation directly contributes to Sustainable Development Goals (SDGs) 2 (Zero Hunger), 7 (Affordable and Clean Energy), 11 (Sustainable Cities and Communities), and 13 (Climate Action). Testing and community feedback mechanisms are integral to refining its applicability and effectiveness. The expected outcome is a cleaner, more sustainable ecosystem where households benefit from renewable energy and nutrient-rich fertilizer while reducing methane emissions and landfill waste.

PYROPURE: A GREENER PYROLYSIS REACTOR WITH LINEAR FRESNEL LENS AND UPCYCLED LPG TANK

Alika Mae V. Maglasang, Poe Alexander C. La Victoria, and Chris Nathan C. Limjoco
Cagayan de Oro National High School - Junior High School

This paper presents PyroPure, a sustainable innovation designed to mitigate plastic pollution and reduce greenhouse gas emissions through an eco-friendly pyrolysis system. The project addresses the environmental threat posed by plastic waste, which persists in land and marine ecosystems and contributes to climate change through open burning and improper disposal. PyroPure integrates a linear Fresnel lens to harness solar energy and utilizes non-condensable gases (NCGs) from the pyrolysis process as supplemental heat sources, reducing the need for external fossil fuels. An upcycled LPG tank serves as a rotating pyrolysis chamber, improving heat distribution, while a water-based scrubber captures harmful emissions. The system is designed with community scalability, cost-efficiency, and safety in mind, aligning strongly with SDG 13: Climate Action. Through literature review, simulation, small-scale testing, and community engagement, the project demonstrates the potential for localized, low-carbon waste-to-energy solutions. Its educational value and circular design further contribute to climate resilience and sustainable development goals.

Category C (Innovation)

ANYFLOW: PROVIDING SAFE AND DRINKABLE WATER TO ALL

Anika Dominique A. Quiblat, Jaime Ceasar B. Arellano , Ebraheem S. Tomawis
Rosevale School

The AnyFlow project introduces a portable water filtration system with an integrated electric boiler designed to provide clean and drinkable water in remote or underserved areas. In response to the global water crisis, where over 2.2 billion people lack access to safely managed drinking water, this innovation aligns with Sustainable Development Goal 6: Clean Water and Sanitation. Unlike conventional portable filters, AnyFlow incorporates a battery-powered boiler to eliminate bacteria and viruses that standard filters may miss, offering a safer, more reliable solution. The product's development includes expert consultations, prototyping, and data-driven refinement. By reducing reliance on bottled water and its harmful plastics, AnyFlow also contributes to environmental sustainability. The innovation targets individuals in coastal and isolated areas, aiming to decrease waterborne diseases and promote health equity through accessible, safe hydration anytime, anywhere.

A SOLAR-POWERED AUTOMATED VERTICAL AQUAPONICS PROTOTYPE INTEGRATING NILE TILAPIA AND COMPATIBLE CROPS FOR URBAN FOOD SECURITY

John Michael Ang, Najwa Launto, and Zoe Aleja Stacy Parba
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This study presents the development of a solar-powered vertical aquaponics system integrating Oreochromis niloticus (Nile tilapia) and four selected crops: kangkong, pechay, tomato, and spring onion. Designed for urban sustainability, the system utilizes automated pumping and sensor-based monitoring to regulate water flow, fish feeding, and environmental conditions. A backup reservoir and real-time mobile alerts support maintenance efficiency. Constructed using PVC and cost-effective materials, the prototype aims to address food security and resource conservation in highly urbanized areas such as Cagayan de Oro City. The innovation supports sustainable agriculture through a closed-loop system that maximizes productivity while minimizing environmental impact.

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