CEBU TECHNOLOGICAL UNIVERSITY - TUBURAN CAMPUS
FUTURE SCIENCE AND TECHNOLOGY LEADERS
OF THE PHILIPPINES

*in partnership with the*

PHILIPPINE ASSOCIATION FOR TEACHERS AND
EDUCATORS (PAFTE), INC. - REGION VII

*presents*

## *1st International and 4th Institutional*

# Research Congress and Online Discussion

# RECOD 2026

***Theme:*** **"Technological Innovation and Academic Sustainability Towards a Resilient Green Environment"**

**APRIL 15-16, 2026**
**BULAWANONG TINUBDAN CULTURAL CENTER**

# BOOK OF ABSTRACTS

## PET ROEY L. PASCUAL, Ph.D

Vice President for Research & Development

The Office of the Vice President for Research and Development of Cebu Technological University expresses its strong support and commendation to CTU Tuburan Campus for its initiative in organizing the 1st International and 4th Institutional Research Conference (RECOD) with the theme, "Technological Innovation and Academic Sustainability Towards a Resilient Green Environment."

This initiative exemplifies proactive leadership in advancing the University's research and innovation agenda. By convening researchers, faculty, students, and international experts, the campus continues to demonstrate its commitment to strengthening academic collaboration, promoting knowledge exchange, and elevating the quality and impact of research within the University system.

The inclusion of research presentations and exhibits further highlights CTU Tuburan's dedication to showcasing tangible research outputs and encouraging a culture of innovation and scholarly excellence. Such efforts significantly contribute to building a responsive and forward-looking academic community capable of addressing emerging challenges in sustainability and environmental resilience.

The OVPRD likewise recognizes the campus's efforts in bringing international perspectives through invited plenary speakers, which enhance the global relevance and reach of the conference.

Let this initiative serve as a model across the University System, one that inspires every campus to actively cultivate a culture of research, innovation, and collaboration. May this conference not only showcase knowledge, but also ignite greater commitment among researchers, faculty, and students to translate ideas into meaningful solutions that advance sustainability, resilience, and inclusive development.

**PET ROEY L. PASCUAL, Ph. D.**
Vice President for Research & Development

## MA. CARLA Y. ABAQUITA, RChE, Dev. Ed. D.

Campus Director

My commendation to the respected faculty members, research advisers, and brilliant student researchers of Cebu Technological University– Tuburan Campus and Tabuelan Extension Campus who are behind this First International and Fourth Institutional Students' Research Congress.

This year's theme, "Technological Innovation and Academic Sustainability Towards a Resilient Green Environment", is not just timely; it is urgent. We are living in a period where the choices we make, the research we pursue, and the innovations we create will define the future of our planet.

We are all witnesses to the realities of climate change, environmental degradation, and resource depletion. These are not distant threats, they are present challenges. And yet, within these challenges lies an extraordinary opportunity: the opportunity for innovation, for collaboration, and for leadership.

This is where you, our student researchers, come in.

Technology has become one of the most powerful tools in addressing environmental issues. From renewable energy systems and smart agriculture to waste management solutions and climate modeling, innovation is opening doors that were once unimaginable. But technology alone is not enough. It must be guided by sustainability, ethics, and a deep understanding of its impact on society and the environment.

Academic sustainability, on the other hand, reminds us that learning is not confined to classrooms or laboratories. It is a continuous process of inquiry, responsibility, and application. It challenges us to ensure that our research is not only relevant but also responsive to the needs of our communities and ecosystems.

A resilient green environment is not built overnight. It is the result of consistent effort, informed decisions, and collective action. Resilience means the ability to adapt, to recover, and to thrive despite challenges. And this resilience begins with knowledge, your knowledge.

As students, you are not merely learners; you are innovators, problem-solvers, and future leaders. The research you present today is more than an academic requirement, it is a contribution to a larger mission. Whether your work focuses on engineering, environmental science, information technology, education, or any other field, it has the potential to make a difference.

Let me challenge you with this: Do not limit your research to compliance. Let it be driven by curiosity. Let it be fueled by purpose. Ask yourselves not only, “What can I discover?” but also, “What problem can I solve?” and “Whose lives can I improve?”

Innovation does not always mean creating something entirely new. Sometimes, it means improving what already exists. Sometimes, it means applying known solutions in new contexts. And often, it means working together across disciplines, cultures, and perspectives.

As we move forward, we must embrace interdisciplinary collaboration. The environmental challenges we face are complex, and they require solutions that integrate science, technology, policy, and human behavior. No single field holds all the answers, but together, we can create meaningful change. To our educators and mentors, thank you for guiding these young minds, for nurturing their curiosity, and for inspiring them to pursue excellence with integrity and purpose.

And to our students: this Congress is your platform. Share your ideas with confidence. Listen with openness. Engage in discussions. Learn from one another. And most importantly, believe in the value of your work.
The future we envision, a resilient, sustainable, and green environment, is not beyond our reach. It begins here. It begins with research. It begins with you.

Let us move forward with determination, guided by innovation, grounded in sustainability, and inspired by the vision of a better world.

Thank you, and may your research continue to make a meaningful impact.

**MA. CARLA Y. ABAQUITA, RChE, Dev. Ed. D.**
**Campus Director**

## ROWENA P. ABAQUITA, Dev. Ed. D.

Dean of Instruction

Dear Participants, Sponsors, and Guests of RECOD 2026,

GREETINGS to the 2026 Research Conference on Development (RECOD), hosted by Cebu Technological University! Our theme, "Technological Innovation and Academic Sustainability Towards a Resilient Green Environment," embodies the spirit of academic excellence: empowering students and faculty to lead tech- based initiatives for sustainability.

To our Dear students, this is a spring board to innovate, think AI for biodiversity tracking or green and sustainable energy prototypes. To ALL educators, let this RECOD 2026 serve as a platform and space to guide and to mentor, collaborate, and enhance robust teaching pedagogy. Together, we bridge theory and practice, cultivating a more sustainable and greener academic environment.

The significance extends to our communities as these ideas will help influence and shape policies, strengthen local resilience against climate challenges, and create sustainable futures for Cebu City and even further.

Thanks to ALL the working Committee and the support of the Administration for your vital role. Together, let's innovate, sustain, and elevate!

**DR. ROWENA P. ABAQUITA, Dev. Ed. D.**
**Dean of Instruction**

## FLORIEZA M. MANGUBAT, Ph. D., Ed. D.

Chair, Research & Development

This Student Research Congress, with the theme “Technological Innovation and Academic Sustainability towards a Resilient Green Environment,” reflects CTU-Tuburan pride and excitement for your participation. This event highlights both the importance of students as innovators and critical thinkers and the need to be responsible stewards of a sustainable future.

As our planet faces more complex environmental challenges, new ways of thinking and new ideas have become increasingly important. At this congress, we recognize that students are not just recipients of knowledge; they also have the ability to create that knowledge and to be a force in creating technology and sustainable solutions that impact their community and the entire world.

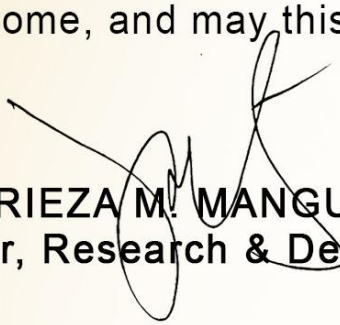
All of the research projects presented here demonstrate passion, thoughtful investigation, and effort to alleviate issues in real-life situations through their work. They have gone above and beyond all academic requirements; your projects also demonstrate vision by linking theory to practice to create substantial, lasting environmental resilience and improved human conditions.

We hope this Congress gives you the opportunity to empower each other, work together more effectively, be creative, and feel more confident in your ability to achieve greatness as professionals and future leaders. Use it to think outside the box, question current ways of thinking, and accept that you have a duty to become great as a businessperson or leader one day.

As you participate in this intellectual discourse, keep in mind that each question, every thought that gets put forth, and each revelation foments a great push towards sustainability and enduring prosperity for our planet. The future health of the earth will be shaped by both high-tech solutions as well as the moral fiber (values), the energy (actions), and outlook (vision) of people who care about people like you!

All student researchers are commended for persevering through difficult times and for the creative and passionate pursuit of excellence in research. This experience should inspire all of you to continue to pursue research that is meaningful - research that will help to help everyone, and research that will last.

Welcome, and may this congress be both meaningful and inspiring for all.



FLORIEZA M. MANGUBAT, Ph. D., Ed. D.
Chair, Research & Development

**PROGRAMME**
**DAY 1**
**LECTURE FORUM**
**April 15, 2026, Wednesday (8:30 AM)**
Venue: Online via Zoom

| | | |
|---|---|---|
| **I.** | **Registration (8:30 AM– 9:00 AM)** | COA Faculty |
| **II.** | **Invocation** | Wires |
| **III.** | **Philippine National Anthem** | Wires |
| **IV.** | **Bagong Pilipinas Hymn** | Wires |
| **V.** | **ASEAN Hymn** | Wires |
| **VI.** | **Sugbo hymn** | Wires |
| **VII.** | **Welcome Address and Acknowledgement of participants** | **DR. MA. CARLA Y. ABAQUITA**<br>Campus Director |
| **VIII.** | **Statement of Purpose** | **DR. ROWENA P. ABAQUITA**<br>Dean of Instruction |
| **IX.** | **Introduction of the Plenary Speaker 1** | **DR. ADELIOSA G. MENCHAVEZ**<br>Dean, College of Education |
| **X.** | **Plenary Speaker 1** | **DR. LYNNETTE MATEA S. CAMELLO**<br>Vice-Chair, PAFTE Region VII |
| **XI.** | **Introduction of the Plenary Speaker 2** | **DR. FLORIEZA M. MANGUBAT**<br>Chair, Research & Development |
| **XII.** | **Plenary Speaker 2** | **DR. KHADEM HUSSAIN SAEEDI**<br>Kandahar University, Afghanistan |
| **XIII.** | **Open Forum** | |
| **XIV.** | **Awarding of Tokens and Certificates** | **DR. MA. CARLA Y. ABAQUITA**<br>Campus Director<br>**DR. FLORIEZA M. MANGUBAT**<br>Chair, Research & Development |
| **XV.** | **Closing Remarks** | **DR. MARIA LENI G. TORRALBA**<br>Assistant Campus Director |
| **XVI.** | **CTU Hymn** | **Wires** |

**LUNCH BREAK**

**MR. JOHN RYAN LEDESMA**
**MS. XYSTI MONCADA**
Master of Ceremonies

**DAY 1**
**SIMULTANEOUS ONLINE PAPER PRESENTATION**
April 15, 2026 (Wednesday) 1:00 PM
Venue: Online via Zoom

| | | |
|---|---|---|
| **I.** | **Introduction of the Panelists and Reading of Criteria for Judging** | Moderator |
| **II.** | **Awarding of Certificates and Tokens** | Moderator |

**Cluster 1: Food Security and Agriculture**
**Moderator:** MR. CARLO BALVEZ
**Panelists:**
1. DR. ZANDRO O. PEREZ (External)
2. PROF. JULIAN O. CUMAD
3. DR. MONIFEL G. CALDERON

**Cluster 2: Engineering and Technology Innovation**
**Moderator:** MR. GENESIS PRESILLAS
**Panelists:**
1. DR. MA. KRISTINA O. PALER (External)
2. ENGR. ANDREW WEB ALCORCON
3. DR. MARK PAUL LIM

**Cluster 3: Education, Social Sciences, and Tourism**
**Moderator:** MRS. GOLDEN TRAVERO
**Panelists:**
1. DR. PRIMO B. ARANAS, JR. (External)
2. DR. JUDE CHARREL B. PAEZ
3. DR. ANGEN MAY F. CHARCOS

**SCHEDULE OF ONLINE PRESENTATION**

| **CLUSTER 1<br>FOOD SECURITY AND AGRICULTURE** | | | |
|---|---|---|---|
| **Time** | **No.** | **Authors Name** | **Paper Title** |
| 1:00 PM-1:15 PM | 1 | Lovelyn C. Salubre | The Effects of Coconut (Cocos nucifera) Shell Charcoal as a Feed Additive on the Growth Performance of Hubbard Chicken (Gallus gallus domesticus) |
| 1:16 PM-1:30 PM | 2 | Rowane L. Ortizano | The Influence of Fermented Coconut (Cocos nucifera) Water Using Yeast (Saccharomyces cerevisiae) on the Growth Performance and Carcass Characteristics of Broiler Chickens (Gallus gallus domesticus) |
| 1:31 PM-1:45 PM | 3 | Christian Mae A. Bacus | Assessing the Growth Performance of Broiler Chicken (Gallus gallus domesticus) Supplemented with Madre de Agua (Trichanthera gigantea) and Duckweed (Lemna minor) |
| 1:46 PM-2:00 PM | 4 | Almira Copas | Dried Water Hyacinth (Eichhornia crassipes) As Feed Supplement for Broiler Chicken (Gallus gallus domesticus) |

| | | | |
|---|---|---|---|
| 2:01 PM-2:15 PM | 5 | Win Love C. Salubre | Integrated Nutrient Management of Sweetcorn (Zea mays L. var. Saccharata) Production |
| 2:16 PM-2:30 PM | 6 | Regine C. Branzuela | Sweet Corn (Zea mays L. var Saccharata) Production with Vesicular Arbuscular Mycorrhizal (Vam) Fungi and Chicken Manure Application |
| 2:31 PM-2:45 PM | 7 | Mary Darl Lorrane B. Bracero | Sweetcorn (Zea mays L. var. saccharata) as Influenced by Different Rates of Fermented Fish Amino Acid (FFAA) for Food Production |
| 2:46 PM-3:00 PM | 8 | Mark Lyndon B. Guinanas | Assessing the Impact of Fermented Coconut Pulp (Cocos nucifera) on the Growth Performance and Nutritional efficacy of Get Excel Tilapia (Oreochromis spp.) |
| 3:01 PM-3:15 PM | 9 | Genevere M. Tingal | A Phenomenological Inquiry on Food Safety Awareness among Street Food Vendors in Tuburan, Cebu |
| 3:16 PM-3:45 PM | 10 | Aileen Monares | Assessment of Empanada Dough Enriched with Coconut Pulp and Kangkong Stem (Ipomoea aquatica) |
| 3:46 PM-4:00 PM | 11 | Adrian C. Poloyapoy | Feasibility Assessment of Climate-Resilient NSIC RC222 Rice–Fish Symbiotic Integration Via Innovative Floating Platforms in Philippine Lowland Ponds |

| **CLUSTER 2<br>ENGINEERING AND TECHNOLOGY INNOVATION** | | | |
|---|---|---|---|
| 1:00 PM-1:15 PM | 1 | Sheila Mae S. Pacaldo | Web-Based Faculty Development with HR Monitoring System |
| 1:16 PM-1:30 PM | 2 | Arshane Lee B. Sucong | Fairora: A Smart Trading Marketplace for Digital Goods |
| 1:31 PM-1:45 PM | 3 | Reb Jeryl D. Mahilum | LearnMath: Smart LMS for Early Learners with Adaptive & Gamified Learning |
| 1:46 PM-2:00 PM | 4 | Christian Jake A. Lape | Web-Based Honor Application System |
| 2:01 PM-2:15 PM | 5 | Kristine Myrh Camus | Workforce Optimization Model for Balamban Construction and Marine Services |
| 2:16 PM-2:30 PM | 6 | Sherwin A. Payot | Operations and Quality Management System for Harvest Consolidation (Bagsakan) Facility in the Municipality of Tuburan |
| 2:31 PM-2:45 PM | 7 | Quesh Keziah Jael B. Galupo | Smart Swine Cleaning System: Development of Artificial Intelligence (AI)-Based Hog Washing Solution Using the DMADV Approach |
| 2:46 PM-3:00 PM | 8 | Marichan G. Estrera | INKSPIRE: A FEASIBILITY STUDY ON THE UTILIZATION OF ONION PEELS AS A NATURAL DYE SOURCE FOR SUSTAINABLE INK FORMULATION |
| 3:01 PM-3:15 PM | 9 | Ritche Mae C. Waskin | Fire Hero: Gamified 3D Immersive Fire Safety Simulator |
| 3:16 PM-3:30 PM | 10 | Clemente M. Alferez | Assessing the Development and Acceptability of a Dual Motor and Fan Cooling System for a High Speed Sewing Machine |
| 3:31 PM-3:45 PM | 11 | Janward A. Juntong | Examining the Development and Acceptability of a Water Vending Monitoring System Utilizing Plastic Bottle |
| 3:46 PM-4:00 PM | 12 | Bragat Dariel J. | Assessment on Egg Quality and Monitoring System |
| 4:01 PM-4:15 PM | 13 | Raven D. Bacoli | Smart Waiting Sheds and LED-Enhanced Pedestrian Lanes for Improved Commuter's Safety and Visibility |
| 4:16 PM-4:30 PM | 14 | Hannah Jane F. Manigos | Examining the Development of Sponge Gourd Fiber Wall Cladding and Its Acceptability |

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|---|---|---|---|
| 4:31 PM-4:45 PM | 15 | Jane Edrianne Cañedo | Exploring A Sustainable Approach to Scrunch Sheet Fiber Production and Its Acceptability Using Corn silk (Zea mays L., family Poaceae) and Taro (Eddoe, Colocasia esculenta) |
| 4:46 PM-5:00 PM | 16 | Cheljan B. Teves | Value Chain Analysis of Selected Fruit-Bearing Vegetables in Tuburan, Cebu |

| **CLUSTER 3<br>EDUCATION, SOCIAL SCIENCES, AND TOURISM** | | | |
|---|---|---|---|
| 1:00 PM-1:15 PM | 1 | Arnie Rey S. Lonzaga | Philippine News Outlet: The Use of Philippine English in News Headlines |
| 1:16 PM-1:30 PM | 2 | Jochebed Rova D. Sarlatan | Comparative Study of Pre-Service Teachers' Personality Traits and the Level of Preparedness |
| 1:31 PM-1:45 PM | 3 | Naomie Janery D. De Chavez | Social Environment Factors Hindering the Second Language Acquisition of Children |
| 1:46 PM-2:00 PM | 4 | Anajoyce M. Roble | Students' Performance in Oral Presentation and Motivations in Purposive Communication among BSHM-3C |
| 2:01 PM-2:15 PM | 5 | Justin Andre T. Marquez | Feasibility of Sustainable Pasalubong Baskets from Bamboo and Abaca (Bamusa) in Tuburan, Cebu |
| 2:16 PM-2:30 PM | 6 | Vincent R. Lesmes | Determining the Perceived Life and Career Skills among the Graduates towards Digital Competence |
| 2:31 PM-2:45 PM | 7 | Shanen M. Libongcogon | Marketing Analysis of Molobolo Spring in the Municipality of Tuburan |
| 2:46 PM-3:00 PM | 8 | Crisly C. Bucay | Employing Learner-Centered Instruction in Teaching Science |
| 3:01 PM-3:15 PM | 9 | Giodhiel I. Gallarde | Assessment of Interactive Language-Learning Activities in Improving Oral Proficiency |
| 3:16 PM-3:30 PM | 10 | Airah P. Anguay | Determining Information and Communication Technology Competence and Preparedness among Pre-Service Teachers |
| 3:31 PM-3:45 PM | 11 | Hyacinth B. Durango | Assessment of Teacher Support on the Motivational Factors of Learners |
| 3:46 PM-4:00 PM | 12 | Samantha Faye Alcoma | Reading Comprehension Barriers of Fourth Grade English Language Learners |
| 4:01 PM-4:15 PM | 13 | Jennafae B. Aliviado | Assessing Waste Management Awareness and Implementation among Food Service Providers |
| 4:16 PM-4:30 PM | 14 | Rose Mae G. Tapil | Gender, Power, and Violence in Bita and the Botflies' Album "Peklat Cream" |
| 4:31 PM-4:45 PM | 15 | Angelo J. Lanipga | Substantiating the Determinants in Career Choice Plans among Senior High School Students |

**PROGRAMME**
**DAY 2**

**RESEARCH EXHIBIT COMPETITION AND DISCUSSION**

**April 16, 2026 (Thursday) 8:30AM**

Venue: Bulawanong Tinubdan Cultural Center

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|---|---|---|
| **I.** | **Registration (8:30AM-9:00 AM)** | COA FACULTY |
| **II.** | **Invocation** | Wires |
| **III.** | **Raising of Philippine Flag and CTU Flag** | CTU TC – ROTC OFFICERS |
| **IV.** | **Philippine National Anthem** | Wires |
| **V.** | **Bagong Pilipinas Hymn** | Wires |
| **VI.** | **ASEAN Hymn** | Wires |
| **VII.** | **CTU Hymn** | Wires |
| **VIII.** | **CTU Tuburan Campus Promotional Video and RECOD Video Clip Presentation** | |
| **IX.** | **Welcome Address** | **DR. MA. CARLA Y. ABAQUITA**<br>Campus Director |
| **X.** | **Statement of Purpose** | **DR. FLORIEZA M. MANGUBAT**<br>Chair, Research and Development |
| **XI.** | **Acknowledgment of Participants** | **DR. JOHNREL M. PAGLINAWAN**<br>BSIT Faculty, FSTLP Adviser |
| **XII.** | **Message of Support** | **ENGR. GRECILDA "Gigi" SANCHEZ-ZABALLERO**<br>Capitol Consultant for Livelihood and Sustainable Agriculture |
| **XIII.** | **Message of Support** | **HON. REX CASIANO T. GERONA**<br>Mayor, Tabuelan, Cebu |
| **XIV.** | **Message of Support** | **DR. TRISTAN L. ABANDO**<br>Regional Director, DOST VII |
| **XV.** | **Dance Presentation** | **BTDC** |
| **XVI.** | **Message of Support** | **HON. AMOS EDWIN C. CABAHUG**<br>Mayor Balamban, Cebu |
| **XVII.** | **Message of Support** | **HON. DANA ANDREW M. DUMDUM**<br>Mayor, Asturias, Cebu |
| **XVIII.** | **Message of Support** | **DR. PET ROEY L. PASCUAL**<br>VP, Research and Development |
| **XIX.** | **Message of Support** | **HON. CHRISTIAN DANIEL DIAMANTE**<br>Mayor, Tuburan, Cebu |
| **XX.** | **Introduction of Judges and Reading of Criteria** | **DR. LANNY MERRYL N. GALLARDE**<br>Dean. College of Arts and Sciences |

**XXI.** **Cutting of Ribbons and Opening of Exhibits** **Guests**

**XXII.** **Sword Execution** **CTU TC – ROTC OFFICERS**

**XXIII.** **Awarding of Certificates and Tokens**

**Cluster 1: Food Security and Agriculture**
**Panelists:**

1. DR. REYNANT ANGELO PEREZ LEPITEN (External)
2. ENGR. GRECILDA "Gigi" SANCHEZ-ZABALLERO
3. HON. REX CASIANO T. GERONA
4. MS. LESLIE CABILLO
5. DR. VICEL B. ALBAÑO

**Cluster 2: Engineering and Technology Innovation**

1. DR. ANALIZA B. CALLES (External)
2. HON. CHRISTIAN DANIEL DIAMANTE
3. HON. AMOS EDWIN C. CABAHUG
4. DR. JAMES PAUL TAMAYO
5. ENGR. LEA MARIE P. RELAVO

**Cluster 3: Education, Social Sciences, and Tourism**
**Panelists:**

1. DR. LYNNETTE MATEA S. CAMELLO (External)
2. HON. DANA ANDREW DUMDUM
3. DR. TRISTAN L. ABANDO
4. DR. ANTONIO CINCO JR.
5. MR. GENESIS PRESILLAS

**MS. ALICIA C. LEDRES**
**MR. JAYWARD BANDOLON**
Masters of Ceremonies

**PROCLAMATION AND AWARDING OF RECOD 2026 WINNERS**

April 16, 2026, Thursday (1:30 PM)

Venue: Bulawanong Tinubdan Cultural Center

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|---|---|
| **I. Invocation** | **Wires** |
| **II. Turnover of RECOD 2028** | **ENGR. FERNANDO N. MANGUBAT JR.**<br>Dean, College of Technology |
| **III. Acceptance Speech of RECOD 2028** | **ENGR. ALDEN Q. GABUYA JR**.<br>Dean, College of Engineering |

**IV. Announcement of Winners**

**Cluster 1:**

Best Research Presenter (1st, 2nd, 3rd)
Best Product Exhibit (1st, 2nd, 3rd)
Best innovation (Research presentation)
Best Innovation (Product exhibit)
Best Policy Impact (Research Presentation)
Best Market-ready Product (Product Exhibit)
Best SDG-aligned Product (Product Exhibit)

**V. INTERMISSION NUMBER (Song Rendition)**

**VI. Awarding of Winner**

**Cluster 2:**

Best Research Presenter ($1^{st}$, $2^{nd}$ , $3^{rd}$)
Best Product Exhibit ($1^{st}$, $2^{nd}$ , $3^{rd}$)
Best innovation (Research presentation)
Best Innovation (Product exhibit)
Best Policy Impact (Research Presentation)
Best Market-ready Product (Product Exhibit)
Best SDG-aligned Product (Product Exhibit)

| | |
|---|---|
| **VII. Intermission Number** | JERVIE BENITEZ<br>BIT 2- COMPTECH |

**VIII. Announcement of Winners**

**Cluster 3:**

Best Research Presenter ($1^{st}$, $2^{nd}$, $3^{rd}$)
Best Product Exhibit ($1^{st}$, $2^{nd}$, $3^{rd}$)
Best innovation (Research presentation)
Best Innovation (Product exhibit)
Best Policy Impact (Research Presentation)
Best Market-ready Product (Product Exhibit)
Best SDG-aligned Product (Product Exhibit)

| | |
|---|---|
| **IX. Dance Finale** | BTDC |
| **X. Photo Opportunity** | |

**ENGR. AEA GEORGETTE YAMSON**

Lady of Ceremony

# ABSTRACTS

# THE EFFECTS OF COCONUT (*Cocos nucifera*) SHELL CHARCOAL AS A FEED ADDITIVE ON THE GROWTH PERFORMANCE OF HUBBARD CHICKEN (*Gallus gallus domesticus*)

**Lovelyn C. Salubre**

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**Cebu Technological University- Tuburan Campus**

## ABSTRACT

This study evaluated the effects of coconut (Cocos nucifera) shell charcoal as a feed additive on the growth performance of Hubbard chickens (Gallus gallus domesticus). Sixty broiler chicks were randomly assigned to a completely randomized design (CRD) with five treatments: T0 (100% commercial feeds), T1 (94% feeds + 6% charcoal), T2 (92% feeds + 8% charcoal), T3 (90% feeds + 10% charcoal), and T4 (88% feeds + 12% charcoal), each replicated three times. Measured parameters included feed intake, feed conversion ratio (FCR), weight gain, water consumption, morbidity and mortality, carcass traits, meat quality, and return on investment (ROI). Results showed that coconut shell charcoal influenced broiler performance. Moderate inclusion, particularly T2 (8%), improved feed intake, weight gain, and dressing percentage (82.14%) compared to the control (75.45%). Meat quality assessment revealed whiter meat with favorable sensory ratings from “Good” to “Very Good” in tenderness, juiciness, aroma, and flavor. However, higher inclusion levels (10–12%) reduced feed efficiency and growth, possibly due to nutrient binding. Despite improvements in growth and carcass traits, ROI remained negative across treatments, with T1 (-59.53%) slightly better than the control (-60.34%), indicating limited economic viability. Overall, moderate charcoal inclusion (6–8%) enhanced growth performance, carcass yield, and meat quality without adverse health effects, but further research is needed to improve cost-effectiveness.

**Keywords**: *charcoal, coconut shell, feed additive, growth, Hubbard chicken, meat pH*

# THE INFLUENCE OF FERMENTED COCONUT (*Cocos nucifera)* WATER USING YEAST *(Saccharomyces cerevisiae)* ON THE GROWTH PERFORMANCE AND CARCASS CHARACTERISTICS OF BROILER CHICKENS (*Gallus gallus domesticus*)

**Rowane L. Ortizano**

ortizanorowane@gmail.com

**Cebu Technological University- Tuburan Campus**

## ABSTRACT

This study investigated the effects of fermented coconut water (FCW) produced with *Saccharomyces cerevisiae* on the growth performance and carcass characteristics of broiler chickens (*Gallus gallus domesticus*). Sixty broiler chicks were allocated in a completely randomized Design with five treatments: a control (T0 – pure water) and four supplementation levels of FCW at 2 mL (T1), 4 mL (T2), 6 mL (T3), and 8 mL (T4) per liter of drinking water, each replicated three times. Results showed that FCW supplementation improved feed intake, body weight gain, feed conversion ratio, and water consumption compared to the control. The 6 mL/L treatment (T3) produced the most balanced outcomes, yielding the highest dressing percentage, the most favorable meat yields, and improved intestinal development. At 8 mL/L (T4), growth performance slightly increased but with minor reductions in meat tenderness. Meat quality, particularly juiciness, flavor, and aroma, was enhanced in FCW-supplemented groups due to higher meat pH, while all treatments were rated acceptable in sensory evaluation. No morbidity was observed, and mortality was limited to one case in T2. Although economic analysis showed negative return on investment (ROI) under small-scale conditions, higher supplementation levels reduced losses, suggesting potential profitability at larger scales. The findings demonstrate that FCW is a sustainable, natural growth promoter that enhances broiler productivity, carcass yield, meat quality, and gut health. Supplementation at 6 mL/L is recommended as the optimal dose for balanced performance and meat quality.

**Keywords:** *broiler chickens, carcass quality, feed conversion ratio, fermented coconut water, growth performance, growth promoter, Saccharomyces cerevisiae*

# ASSESSING THE GROWTH PERFORMANCE OF BROILER CHICKEN (*GALLUS GALLUS DOMESTICUS*) SUPPLEMENTED WITH MADRE DE AGUA (*TRICHANTHERA GIGANTEA*) AND DUCKWEED (*LEMNA MINOR*)

**Christian Mae A. Bacus**

christianbacus10@gmail.com

**Cebu Technological University- Tuburan Campus**

## ABSTRACT

Broiler production is a major component of the Philippine poultry industry, driven by rising demand for affordable animal protein. Despite the exploration of alternative, locally available feed resources, feed cost remains the largest expense in broiler production. Madre de agua (*Trichanthera gigantea*) and duckweed (*Lemna minor*) are potential plant-based feed supplements due to their nutritional value and availability. A six-week feeding trial was conducted to evaluate the effects of air-dried madre de agua and duckweed on the growth performance and meat quality of broiler chickens using a completely randomized design (CRD). Sixty-day-old broiler chicks were randomly assigned to four treatments: T0 (control), T1 (5% air-dried Madre de Agua), T2 (5% air-dried Duckweed), and T3 (5% air-dried Madre de Agua and 5% air-dried Duckweed). Parameters measured included feed and water consumption, feed conversion ratio, body weight gain, carcass characteristics, mortality, and morbidity. Results showed no significant differences among treatments in feed intake, feed conversion ratio, water consumption, and body weight gain. T1 (madre de agua) exhibited better growth performance, efficient feed conversion, and good carcass quality. However, T2 (duckweed) showed only better feed consumption. Mortality and morbidity rates remained low throughout the experimental period, indicating that the dietary treatments did not negatively affect bird health. The findings suggest that madre de agua and duckweed can be used as alternative feed supplements in broiler diets without compromising growth performance and survivability.

**Keywords**: *boiler chicken, duckweed (Lemna minor), feed supplement, growth performance, madre de agua (Trichanthera gigantea)*

# DRIED WATER HYACINTH (*Eichhornia crassipes*) AS FEED SUPPLEMENT FOR BROILER CHICKEN (*Gallus gallus domesticus*)

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## ABSTRACT

Raising broilers is currently one of the primary objectives of Philippine poultry companies. Due to growing demand, industrial adaptation has become increasingly important for the economic performance of this agricultural sector. Furthermore, the primary cost in producing chicken is feed. One such option is water hyacinth. Ruminants can be fed water hyacinth because of its beneficial nutritional value; it can also be used as poultry feed. Water hyacinth (*Eichhornia crassipes*) is popular among both water gardeners and aquarists because it is one of the few floating aquatic plants. However, it is also considered an invasive aquatic weed in tropical and subtropical regions, and many attempts have been made to eradicate or control it. A 45-day feeding trial using a completely randomized design (CRD) evaluated the effects of water hyacinth on broiler growth performance and meat quality. Sixty-day-old broiler chickens were randomly allotted to five treatment groups: T0 (pure commercial feeds), T1 (2.5% dried water hyacinth), T2 (3%), T3 (3.5%), and T4 (4%). The study recorded growth, feed, water, carcass, meat quality, and economic parameters, showing that 2.5% dried water hyacinth improved growth performance and maintained meat quality comparable to other treatments.

***Keywords:*** *broiler chicken, feed supplement, growth performance, meat quality, water hyacinth*

# INTEGRATED NUTRIENT MANAGEMENT OF SWEETCORN (*Zea mays* L. var *Saccharata)* PRODUCTION

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## ABSTRACT

Sweet corn (*Zea mays* L. var. *Saccharata*) is an economically important crop due to high market demand and profitability. Conventional cultivation with heavy inorganic fertilizer use increases costs and harms the environment. This study evaluated the effects of integrated nutrient management (INM) on sweetcorn growth and yield, developed an INM scheme, and assessed profitability. Conducted in Capilla, Tigbawan, Tabuelan, Cebu, from June 12 to August 22, 2025, the experiment used a randomized complete block design with six treatments, each replicated three times. The treatments were designated as follows: T0 -Inorganic Fertilizer (143 kg ha-1 N+ 37 kg ha-1 K2O), T1 -10T ha-1 of Chicken Manure (187.5g plant-1), T2 - 0.5T ha-1 Bone Meal (9.4g plant-1), T3-75% N-K2O+ 10T ha-1 of Chicken Manure + 0.5T ha-1 of Bone Meal, T4 -50% N-K2O+ 15T ha-1 of Chicken Manure + 0.75T ha-1 of Bone Meal, T5 -25% N-K2O + 20T ha-1 of Chicken Manure + 1T ha-1 of Bone Meal. The study showed that increasing organic fertilizers, such as chicken manure and bone meal, while reducing inorganic fertilizers, significantly improved sweet corn performance. T5 had the highest husk and cob weight, ear length and diameter, stover yield, and marketable ears. T4 recorded the tallest plants and largest leaves, T3 had the widest leaves and most ears, and T1 achieved the highest harvest index and return on investment. These results support sustainable, profitable sweet corn production.

**Keywords:** bone meal, chicken manure, growth, inorganic fertilizer, integrated nutrient management, profitability, sweetcorn, yield

# SWEET CORN (*Zea mays* L. var *Saccharata)* PRODUCTION WITH VESICULAR ARBUSCULAR MYCORRHIZAL (VAM) FUNGI AND CHICKEN MANURE APPLICATION

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## ABSTRACT

Sweet corn (Zea mays L. var. saccharata) is a widely cultivated crop valued for its nutritional and economic importance. However, the improper use of chemical fertilizers reduces soil fertility and negatively affects microorganisms. This study evaluated the effects of chicken manure (CM) and vesicular arbuscular mycorrhiza (VAM) on sweetcorn production and profitability using experimental treatments, measuring plant growth, yield, and economic returns across different treatment combinations. Among the parameters assessed, the treatments showed significant and positive results in ($T_3$) 2RR VAM + CM (5 t $ha^{-1}$). The combination provided the highest fresh stover yield value (8.95 t $ha^{-1}$), harvest index (31.57%), husk weight (36.25g), cob weight (138.42g), unhusked marketable yield (5.90 t $ha^{-1}$), and dehusked marketable yield (4.61 t $ha^{-1}$). In return of investment, ($T_3$) 2RR VAM + CM (5t $ha^{-1}$) had the highest gross income of Php 206, 500 but also had the highest production cost of Php 85,689, resulting in lower ROI (1.41), compared to the rest of the treatments. The recommended rate of sweetcorn ($T_0$ 120 - 0 - 7 kg/ ha N, $K_2O$, $P_2O_5$) had the highest ROI (3.49), due to lower total cost (Php 37,214) and higher gross income (Php 166,950).The recommended rate showed higher economic efficiency despite yield variation. Chicken manure and vesicular arbuscular mycorrhiza improved sweetcorn growth and yield, especially in $T_3$. The control treatment had the highest ROI due to lower costs. Overall, these inputs enhanced production, and lower VAM application rates should be further evaluated to reduce inputs.

**Keywords:** chicken manure, microbial inoculation, production, Sweet corn, Vesicular Arbuscular Mycorrhiza (VAM) fungi

# SWEETCORN (*Zea mays* L. var. *saccharata)* AS INFLUENCED BY DIFFERENT RATES OF FERMENTED FISH AMINO ACID (FFAA) FOR FOOD PRODUCTION

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## ABSTRACT

Sweetcorn (*Zea mays L. var. saccharata*) is a popular crop due to its sweet taste, nutritional content, and economic importance. However, maize cultivation is hampered by the high prices of inorganic fertilizers. This study evaluated the effects of Fermented Fish Amino Acid (FFAA) on the growth and yield performance of sweetcorn and assessed its profitability. This study employed an experimental design with different FFAA treatment levels to evaluate the growth, yield, and profitability of sweetcorn. Fermented Fish Amino Acid (FFAA) significantly enhanced the major yield components of sweetcorn, with the highest concentration [T3 (150% of RR FFAA solution)] producing superior performance across almost all parameters. T3 plants consistently produced the highest values in yield and yield components, including ear length (21.58 cm), ear diameter (16.83 cm), cob weight (283.22 g), husk weight (82.72 g), number of ears per plant (1.08), and fresh stover yield (14.67 t ha-1). Furthermore, the treatment was also the most productive in terms of number of marketable ears (47,111.11 ha-1), marketable ears percentage (88.33%), unhusked marketable ears (13.13 t ha-1), and dehusked marketable ears (15.71 t ha-1). Compared to the other treatments, T3 had a reduced production cost and the highest return on investment (ROI). These results indicate that FFAA has a positive effect on sweetcorn growth and yield. FFAA even outperformed the recommended inorganic fertilizer results. Higher FFAA rates generated greater returns due to higher marketable yields and reduced reliance on synthetic fertilizers. Therefore, the use of FFAA is a profitable and sustainable option for sweetcorn farmers.

**Keywords:** fermented fish amino acid (FFAA), foliar application, organic fertilizer, sweetcorn production

# ASSESSING THE IMPACT OF FERMENTED COCONUT PULP (*Cocos nucifera*) ON THE GROWTH PERFORMANCE AND NUTRITIONAL EFFICACY OF GET EXCEL TILAPIA (*Oreochromis ssp.*)

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## ABSTRACT

This study investigated the effects of incorporating fermented coconut pulp (FCP) into the diets of GET Excel Nile tilapia (Oreochromis spp.) on growth performance, feed utilization, survival, and profitability over a 60-day culture period. Four treatments were tested: T0 (100% commercial feed), T1 (25% FCP), T2 (35% FCP), and T3 (45% FCP). Growth parameters, including weight gain, feed conversion ratio (FCR), daily growth rate (DGR), specific growth rate (SGR), and absolute length gain (ALG), were monitored biweekly, along with survival rate and return on investment (ROI). Results showed that T1 achieved superior early growth and feed efficiency, particularly during the second and fourth weeks, likely due to enhanced digestibility and nutrient availability from EM4 fermentation. However, performance declined in later stages due to algal bloom collapse, turbid water, and reproductive activity, which reduced feed intake, especially in treatments using sinking pellets. High FCP inclusion in T3 diluted protein content and increased fiber levels, resulting in poor growth, inefficient feed conversion, and higher mortality. Survival was highest in T0 and T2 (100%), while T1 and T3 recorded 10% mortality, attributed to cannibalism linked to reproductive aggression and imbalanced sex ratios. Economic analysis revealed negative ROI across all treatments, with T0 and T2 performing slightly better. Overall, moderate FCP inclusion improved growth and efficiency, but profitability remained constrained by mortality and short culture duration.

**Keywords**: *coconut pulp, effective microorganisms (EM4), growth, nile tilapia*

# A PHENOMENOLOGICAL INQUIRY ON FOOD SAFETY AWARENESS AMONG STREET VENDORS IN TUBURAN, CEBU

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## ABSTRACT

Street food played a significant role in providing locals and tourists with accessible, affordable meals. However, these foods also present health risks due to alleged improper hygiene and handling practices. This study explored the lived experiences of street food vendors regarding food safety awareness in the Municipality of Tuburan, Cebu. The participants were selected through criterion sampling, focusing on vendors with at least 5 years of experience. Also, the data were collected through in-depth interviews and analyzed using Colaizzi's phenomenological method. Before data collection, the semi-structured questionnaire was validated for relevance, clarity, and appropriateness. The findings revealed that while most street food vendors understood the importance of cleanliness and sanitation, many struggled with limited resources, a lack of formal training, and poor access to proper facilities, which further hindered their ability to consistently apply food safety practices in their daily operations. Thus, the study concludes that street food vendors in Tuburan possessed a foundational understanding of food safety; however, external limitations continue to hinder them. These barriers prevent consistent implementation of food safety measures despite vendors recognizing their importance. This study recommends government-led training programs, better facilities, and increased support to improve food safety standards among street food vendors and protect public health.

**Keywords:** awareness, cleanliness, food safety, hygiene, practices, street food, vendors

Adviser: Mr. Genesis Presillas

# ASSESSMENT OF EMPANADA DOUGH ENRICHED WITH COCONUT PULP AND KANGKONG STEM (*Ipomoea aquatica*)

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## ABSTRACT

This study assessed the acceptability of an empanada dough recipe enriched with coconut pulp powder and kangkong stem in terms of sensory quality, cost efficiency, and commercial potential by determining the most acceptable formulation among three variations using quantitative evaluation. A quantitative research design was utilized. Three empanada dough formulations were developed by varying the levels of coconut pulp powder at 75g, 95g, and 125g, while maintaining a constant amount of 40g shredded kangkong stem and uniform quantities of other ingredients. Standardized food preparation procedures were applied. Sensory evaluation was conducted using a structured hedonic scale to assess sensory attributes, including color, aroma, texture, taste, and overall acceptability. A total of 45 panelists participated in the study, consisting of 15 trained panelists and 30 consumer panelists. A quantitative cost analysis was also performed to determine the gross food cost and the selling price of each formulation. The results showed that Formulation 2, containing 95 g coconut pulp powder, 155 g all-purpose flour, and 40 g shredded kangkong stem, obtained the highest mean scores across all sensory attributes, indicating greater consumer acceptability. This formulation produced 15 pieces, with a gross food cost of Php 141.35 (Php 9.42 per serving) and a selling price of Php 12.49 (a 30% markup). The findings indicate that the product is both acceptable and economically viable, providing a basis for developing a techno-guide to support sustainable food innovation and commercial application.

***Keywords:*** assessment, coconut pulp, dough, empanada, formulation, kangkong stem

# FEASIBILITY ASSESSMENT OF CLIMATE-RESILIENT NSIC RC222 RICE–FISH SYMBIOTIC INTEGRATION VIA INNOVATIVE FLOATING PLATFORMS IN PHILIPPINE LOWLAND PONDS

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## ABSTRACT

Philippine rice farming faces escalating climate variability, intensified typhoons, prolonged droughts, and coastal salinity intrusion, along with land constraints and reliance on rice imports despite vast arable lowlands. These threats undermine food security, trap smallholder farmers in debt from high synthetic input costs, and degrade flood-prone ecosystems. This study proposes and evaluates a climate-resilient, integrated rice-aquaculture model: high-yielding NSIC Rc222 (Tubigan 18) rice on buoyant Styrofoam-bamboo platforms over bangus (milkfish) and tilapia ponds in freshwater lowlands. Inspired by the Vietnamese Mekong Delta (Berg et al., 2022) and Chinese rice-fish systems (Xie et al., 2024). It recycles aquafeed waste and fish excreta as fertilizers via root biofiltration, with periodic liming to neutralize acidic effluents, stabilize pH, and curb algal blooms for dual-crop health. Optimized for Philippine conditions, PhilRice-recommended Rc222, pest-resistant for irrigated lowlands, thrives on floating beds, elevating crops above floods and salinity. This closed-loop symbiosis eliminates chemical fertilizers, contrasts monoculture's flood vulnerability and labor demands with typhoon-proof dual rice-fish harvests, and increases economic returns compared to monoculture systems via strong economic ratios. A comparative experiment contrasted Earthen Pond-based Floating Beds with traditional monoculture in simulated lowland ponds, yielding full flood survival (versus total loss), superior water quality with low levels of harmful nitrogen, and economic gains without external inputs. Pilot demonstrations confirm scalability via local networks and strengthen rural economies. Rooted in Philippine rice-fish traditions and Asian innovations, this model shifts import-dependent farming to sustainable systems, urging policy incentives for adoption to enhance self-sufficiency amid climate crises.

*Keywords: agro-aquaculture feasibility, climate-resilient agriculture, floating rice-fish integration, lowland ponds, NSIC Rc222, rice-aquaculture symbiosis*

# WEB-BASED FACULTY DEVELOPMENT WITH HR MONITORING SYSTEM

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## ABSTRACT

Faculty development is essential for improving and maintaining teaching quality and professional growth, yet manual tracking often leads to administrative inefficiency. This study aimed to develop a centralized digital system to monitor trainings, seminars, and professional requirements for the faculty of Cebu Technological University Tuburan Campus. Using the Agile Development Model, the researchers built the system in PHP and MySQL to automate the submission and validation of documents such as IDP, LAP, and TSCAR. This iterative development process allowed for continuous feedback and refinement of the user interface. The system features a secure database architecture that ensures data integrity and provides HR administrators with real-time access to faculty credentials. Results from User Acceptance Testing (UAT) and the Technology Acceptance Model (TAM) showed exceptional performance, with an average weighted mean of 4.92 for usability and 4.8 for performance efficiency. These findings indicate that the system is highly effective in reducing manual errors and improving task completion speed. Furthermore, participants noted that the digital workflow significantly reduced the time required to verify compliance documents compared to traditional paper-based methods. In conclusion, the system successfully centralizes faculty records and reduces HR personnel's manual workload. By automating HR compliance, the university ensures accurate documentation and significantly enhances administrative productivity, providing a definitive and sustainable solution for institutional record management. The implementation of this system serves as a foundational model for digital transformation across other campus departments, further streamlining all academic operations.

**Keywords:** Agile Model, Human Resources, Professional Development, Usability and Security Tests, Web-based system

Adviser: Jae an S. Buhia, MIT

# FAIRORA: A SMART TRADING MARKETPLACE FOR DIGITAL GOODS

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## ABSTRACT

The rapid growth of the digital economy has increased the value of intangible assets, but many marketplaces remain inaccessible due to high costs and weak trust systems. To address these issues, this study developed Fairora, a credit-based digital marketplace that enables secure, inclusive, and community-driven trading through credit exchanges and direct product swaps. Built with React 18+ and Firebase, Fairora uses a three-tier user system and community validation to ensure platform quality, trust, and usability. The study employed the Technology Acceptance Model (TAM) questionnaire to assess perceived usefulness, perceived ease of use, and overall user acceptance. Based on responses from 30 participants, the survey yielded average scores of 4.45 to 4.91 across all dimensions, indicating highly positive user perceptions of the system's usability and effectiveness. Additionally, system testing confirmed that all core features, including real-time notifications and role-based access control, successfully passed testing, validating the platform's performance. The study suggests that credit-based and barter-oriented digital marketplaces can serve as viable alternatives to traditional monetized platforms, particularly for creators and users with limited financial access. Fairora demonstrates the potential of community moderation and hybrid trading models in improving trust and sustainability in digital marketplaces. Future implementations may extend this approach to other digital asset ecosystems, such as educational resources, creative content, and freelance services, contributing to a more inclusive and equitable digital economy.

**Keywords:** Digital Marketplace, Peer-to-Peer Exchange, Community-driven Validation, Multi-modal Trading System, Reputation Model

# LEARNMATH: SMART LMS FOR EARLY LEARNERS WITH ADAPTIVE & GAMIFIED LEARNING

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## ABSTRACT

Mathematics is a foundational subject that develops learners' reasoning, problem-solving, and critical thinking skills. However, many young students struggle with basic operations such as addition, subtraction, multiplication, and division due to limited access to interactive and adaptive learning tools. This study aimed to develop LearnMath, a mobile application designed for Grade 1 and Grade 2 learners to provide engaging, personalized, and adaptive Mathematics instruction. The application was developed using Flutter and Firebase and evaluated through usability and functionality testing on mobile devices, along with survey assessments based on system quality and the Technology Acceptance Model (TAM). LearnMath features a child-friendly interface with animations, sound effects, and progress tracking to enhance motivation and retention. The system records progress only when tasks are completed correctly and dynamically adjusts lesson difficulty based on learner performance. It also incorporates gamified elements such as points, badges, challenges, and a Quiz Duel mode that enables learners to compete with peers using randomized questions to prevent predictability. Evaluation results indicate high user satisfaction, with performance efficiency (4.61), usability (4.71), and reliability (4.68) rated as Strongly Agree. TAM results further show strong agreement in perceived usefulness (4.71), perceived ease of use (4.63), and social influence (4.53). These findings demonstrate that LearnMath is effective, user-friendly, and well-accepted, making it a valuable tool for improving early Mathematics education.

**Keywords:** Adaptive Learning, Early Mathematics, Interactive Learning, LearnMath, Progress Tracking, Quiz Duel

Adviser: Jae-an S. Buhia, MIT

# WEB-BASED HONOR APPLICATION SYSTEM

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## ABSTRACT

Accurate and efficient processing of Dean's List applications remains a challenge, where manual submission and evaluation of grade reports are still practiced. Traditional methods require students to print and submit grade documents to advisers, often resulting in delays, repetitive tasks, increased faculty workload, and inconsistencies in the computation of the General Weighted Average (GWA) and in eligibility verification. These limitations hinder the timely recognition of academically outstanding students and underscore the need for a more reliable, automated approach. To address these issues, the Web-based Honor Application System was developed as a centralized academic platform that automates honor application processing and student ranking. The system enables secure PDF grade uploads, automated eligibility checking, real-time application tracking, and role-based access for students, advisers, and chairpersons. A PDF parser was integrated to extract and validate grade data from uploaded documents, enabling accurate, automated GWA computation without manual encoding. The system was developed using an Agile development approach and evaluated through usability testing and a Technology Acceptance Model–based user assessment. Evaluation results showed strong user acceptance, with respondents rating the system highly for usefulness, ease of use, and reliability. The findings indicate that the system effectively reduces processing time, minimizes computational errors, and enhances transparency and communication throughout the honor application process. Overall, the Web-Based Honor Application System provides an efficient and dependable digital solution for managing academic honors and improving institutional recognition workflows.

***Keywords:*** *Academic Honor System, Dean's List Automation, GWA Computation, PDF Parser, Role-Based Access Control, Student Ranking.*

# WORKFORCE OPTIMIZATION MODEL FOR BALAMBAN CONSTRUCTION AND MARINE SERVICES

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## ABSTRACT

Effective workforce management is pivotal to the success of construction projects as it directly impacts cost efficiency, schedule adherence, quality control, and overall project performance. Despite its importance, many construction firms continue to struggle with suboptimal labor allocation practices. Balamban Construction and Marine Services (BCMS) demonstrates this challenge, facing persistent operational inefficiencies such as excessive overtime, frequent skill mismatches, and recurring cost overruns. These issues are primarily driven by reactive, ad hoc workforce planning methods that fail to anticipate project demands or optimize resource allocation. A detailed analysis of five recent BCMS projects quantified the severity of these problems, revealing labor cost overruns ranging from 5% to 7%. Within these figures, overtime expenses alone accounted for an average of 6.5% of total added costs, while a heavy reliance on inconsistent local labor pools further intensified scheduling and productivity challenges. To address these gaps, this study develops an Integer Linear Programming (ILP) optimization model implemented in MATLAB for mathematical formulation and Python for algorithmic scalability to enhance workforce allocation across concurrent projects. The model integrates constraints such as skill requirements, labor availability, overtime limits, and cost parameters to enable data-driven, cost-effective labor deployment. Computational experiments demonstrate the model's effectiveness in minimizing labor costs, reducing overtime, and aligning skills with project demands. This research contributes to construction management practices by leveraging computational tools to transform reactive labor planning into a proactive, optimized system. The proposed framework not only provides BCMS with a scalable and sustainable solution for workforce management but also offers valuable insights and a replicable methodology for the broader construction industry seeking to enhance productivity and control costs.

***Keywords:*** *Construction workforce management, Cost minimization, Integer Linear Programming (ILP), Labor allocation optimization*

# OPERATIONS AND QUALITY MANAGEMENT SYSTEM FOR HARVEST CONSOLIDATION (BAGSAKAN) FACILITY IN THE MUNICIPALITY OF TUBURAN

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## ABSTRACT

This study proposes an operations and quality management system for a planned harvest consolidation facility, locally known as Bagsakan, in the Municipality of Tuburan, Cebu. By centralizing post-harvest handling, sorting, grading, and storage, the facility aims to address challenges faced by Tuburan farmers, including significant post-harvest losses, price volatility, and reliance on value-capturing intermediaries. The municipality seeks to provide farmers with direct access to markets while ensuring consistent quality and supply for consumers and institutional buyers by establishing a Bagsakan facility. The study integrates both qualitative and quantitative techniques to design a system that aligns infrastructure requirements, labor allocation, and logistics with projected crop supply and vendor demand. Stakeholder consultations were conducted with farmers, local agricultural officers, and potential vendors to understand current practices, pain points, and market requirements. These qualitative insights were complemented by simulation modeling to optimize facility operations, including throughput capacity, storage requirements, and workflow efficiency. Key results from the analysis include a daily throughput target of 489.975 kilograms, a calculated storage capacity of 19,750 kilograms to accommodate peak harvest periods, and a space utilization ratio of 73.92%, indicating efficient use of available facility space while allowing for operational flexibility. The findings validate the efficiency of the proposed facility layout and demonstrate its scalability for future expansion as agricultural production increases. By streamlining post-harvest operations and securing direct market access for farmers, this sustainable model reduces waste and boosts economic development, offering a replicable framework for similar rural municipalities.

***Keywords:*** *Agricultural value chain, Bagsakan facility, Operations management, Post-harvest handling,*

# SMART SWINE CLEANING SYSTEM: DEVELOPMENT OF ARTIFICIAL INTELLIGENCE (AI)-BASED HOG WASHING SOLUTION USING THE DMADV APPROACH

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## ABSTRACT

This study introduces an AI-based hog washing system designed specifically for small-scale pig farming operations, developed using the DMADV (Define, Measure, Analyze, Design, Verify) methodology. Traditional manual cleaning methods on small-scale farms are labor-intensive and time-consuming, often resulting in inconsistent cleaning quality, excessive water use, and potential health risks for both animals and handlers. To address these challenges, the developed system integrates artificial intelligence, infrared sensors, computer vision, and microcontroller-based automation to detect pig presence, assess cleanliness levels, and efficiently activate a targeted water-spraying mechanism. The system's design, development, and evaluation were systematically guided by the DMADV methodology, ensuring a structured approach from concept to verification. Additionally, the Technology Acceptance Model (TAM) was employed to assess the system's potential for adoption by evaluating its perceived usefulness and ease of use among target users, particularly small-scale hog farmers. The prototype's performance evaluation demonstrated significant improvements over conventional manual cleaning methods. Results revealed substantial reductions in both cleaning time (46.5%) and water consumption (37.5%), alongside effective removal of visible contaminants, achieving approximately 87% cleaning efficacy. User feedback collected through TAM-based assessments indicated that the automated system was intuitive, easy to operate, and contributed positively to better cleanliness and overall health conditions for the swine. The findings suggest that the AI-based hog washing system, developed through the rigorous DMADV approach and validated using TAM considerations, offers practical and beneficial technological solutions for small-scale pig farming operations. By enhancing operational efficiency, reducing resource consumption, and improving animal welfare, this innovation addresses critical gaps in agricultural technology in resource-constrained farming contexts.

***Keywords:*** *AI-based hog washing, DMADV methodology, Technology Acceptance Model, Small-scale pig farming*

# INKSPIRE: A FEASIBILITY STUDY ON THE UTILIZATION OF ONION PEELS AS A NATURAL DYE SOURCE FOR SUSTAINABLE INK FORMULATION

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## ABSTRACT

The growing demand for sustainable, environmentally responsible products has driven the development of eco-friendly alternatives to conventional petroleum-based inks, which contribute to environmental pollution and chemical waste. This study evaluated the feasibility of InkSpire, an onion peel-based ink that uses agricultural waste as a natural, sustainable dye source. A descriptive-analytical research design was employed, incorporating market surveys, technical production analyses, and financial modeling to determine the project's viability. The results showed that the proposed product is technically feasible, as the production process can support small-scale manufacturing operations. Market analysis indicated positive consumer interest in eco-friendly ink products. Financial projections further confirmed the project's viability, with an initial capitalization of P2,000,000 and projected annual revenues increasing from P2,929,821.43 in 2026 to 3,785,424.11 by 2030. The financial analysis demonstrates that the business can cover production and operating costs while achieving gradual revenue growth over the five-year projection period. The findings establish InkSpire as a financially viable and environmentally sustainable venture that promotes the use of waste, supports responsible production practices, and contributes to sustainable entrepreneurship.

**Keywords:** Agricultural Waste Utilization, Eco-friendly Alternatives, Financial Viability, Onion Peel-based Ink, Sustainable Entrepreneurship

# FIRE HERO: GAMIFIED 3D IMMERSIVE FIRE SAFETY SIMULATOR

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## ABSTRACT

Fire safety education needs effective and engaging tools to help people become more aware and prepared. Fire Hero, an interactive 3D simulation game, was created to put users in realistic home fire emergency situations. The goal was to help them understand fire hazards and use fire extinguishers, emergency exits, and fire-prevention measures. The study utilized the Agile software development model for ongoing design, testing, and improvement. Unity was the main platform, with C# scripting and Unity Animator used for gameplay and character animation. To measure system quality and user acceptance, the Technology Acceptance Model (TAM) was used. Fifty young participants completed a survey assessing performance efficiency, usability, reliability, perceived usefulness, ease of use, and social influence, all rated on a five-point Likert scale. The results showed high scores in all areas: performance efficiency (4.26), usability (4.34), reliability (4.20), perceived usefulness (4.40), ease of use (4.35), and social influence (4.34). These results show that Fire Hero is efficient, easy to use, reliable, and seen as useful and supported by others. The simulation helps promote fire safety knowledge and preparedness in an engaging way. Future research could include more user types, improve performance on less powerful devices, and add new training technologies to make the tool even more effective.

***Keywords:*** *3D simulation game, fire emergency preparedness, fire safety education, technology acceptance model, user acceptance*

# ASSESSING THE DEVELOPMENT AND ACCEPTABILITY OF DUAL MOTOR AND FAN COOLING SYSTEMS FOR A HIGH-SPEED SEWING MACHINE

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## ABSTRACT

High-speed sewing machines routinely experience thermal stress and reliability challenges that affect stitch quality, motor durability, and operator safety. This study aimed to design, develop, and evaluate a dual-motor high-speed sewing machine with a fan-cooling system at Cebu Technological University–Tuburan Campus, Tuburan, Cebu, during the Academic Year 2025–2026. Specifically, it assessed the system's technical development, process integration, functional performance (maintenance, features, functions, reliability, durability, and perceived quality), and acceptability in terms of perceived usefulness, ease of use, behavioral intention to use, and overall acceptability. The research employed an applied quantitative descriptive design, collecting data from 100 respondents, composed of 20 technical experts and 80 non-experts, including students and TANUD beneficiaries. Weighted mean analysis was used to determine the system's effectiveness and acceptability. Results revealed that the dual-motor sewing machine with fan-cooling was highly effective across all functional dimensions, while its acceptability in terms of perceived usefulness, ease of use, and behavioral intention was rated as high. The study concluded that the system significantly improved thermal management, operational reliability, and user ergonomics in high-speed sewing operations. It is recommended that the developed system be adopted in institutional and MSME settings, integrated into technical-vocational curricula, and supported by instructional materials and maintenance manuals to maximize technology adoption, ensure safe operation, and promote long-term sustainability in both educational and practical garment production environments.

**Keywords:** *Dual-motor System, Fan Cooling, High-speed Sewing Machine, MSME Sewing Operations*

# EXAMINING THE DEVELOPMENT AND ACCEPTABILITY OF A WATER VENDING MONITORING SYSTEM UTILIZING PLASTIC BOTTLES

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## ABSTRACT

Access to safe and affordable drinking water remains a public health priority, particularly in the Philippines, where water refilling stations and vending machines supplement piped water supplies. However, many decentralized water vending points lack practical and low-cost monitoring systems capable of tracking dispensing operations, operational performance, and user interactions. This study aimed to design, develop, and evaluate a water vending machine monitoring system integrated with bottle-centric detection and Internet of Things (IoT) sensing features. Specifically, this study examined the system's technical development and its functional effectiveness in terms of detection, performance, conformance, maintenance, and perceived quality, as well as its level of acceptability based on perceived usefulness, perceived ease of use, behavioral intention to use, and overall acceptability. The research employed an applied quantitative research design. Data were gathered through a survey questionnaire administered to 100 randomly selected respondents, composed of students, community members, and teaching and non-teaching personnel at Cebu Technological University–Tuburan Campus during the academic year 2025–2026. The weighted mean was used to assess the effectiveness and acceptability of the developed system. Results revealed that the system's technical development and functional effectiveness in detection, performance, conformance, maintenance, and perceived quality were Highly Effective, while its acceptability in perceived usefulness, perceived ease of use, behavioral intention to use, and overall acceptability was Highly Acceptable. The findings indicated that the monitoring system is a reliable and user-friendly solution in improving water vending operations; thus, its adoption and further enhancement are recommended, along with the development of instructional materials to support proper utilization and maintenance.

**Keywords:** *Acceptability*, *Applied-quantitative, CTU-Tuburan*, *Monitoring system, Plastic bottle*

# ASSESSMENT OF MODIFIED EGG TRAY AND MONITORING SYSTEM

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## ABSTRACT

Public markets handle large volumes of perishable products such as fresh eggs, where freshness, quality sorting, and inventory visibility directly affect food safety, waste reduction, and vendor income. Traditional assessment methods, such as candling and manual inspection, are often subjective and time-consuming, whereas non-destructive techniques, such as visible–near-infrared (Vis–NIR) spectroscopy, hyperspectral imaging, and ultrasonic sensing, have been shown to accurately predict Haugh Unit, albumen height, and yolk index. Coupled with Internet of Things (IoT) integration for real-time monitoring, automated data logging, and inventory management, these technologies enhance traceability and operational efficiency in food systems. This study assessed the development, effectiveness, and acceptability of a modified egg tray freshness and monitoring system at Balamban Public Market, Cebu Province, during the Academic Year 2025–2026. A quantitative research design was employed with 100 respondents, including 80 non-experts and 20 experts, selected via random and purposive sampling. Weighted mean analysis revealed that the system was highly effective in design, egg quality assessment, inventory monitoring, data logging/reporting, reliability, and usability, and highly acceptable in perceived utility, perceived ease of use, behavioral intention, and overall acceptability. The study concludes that the system provides a reliable, user-friendly, and scalable solution for egg quality management in public markets and recommends adoption to support efficient, data-driven monitoring and decision-making.

**Keywords:** *egg freshness, IoT monitoring, non-destructive assessment, public markets, technology acceptance*

# SMART WAITING SHEDS AND LED-ENHANCED PEDESTRIAN LANES FOR IMPROVED COMMUTERS SAFETY AND VISIBILITY

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## ABSTRACT

This study aimed to assess the effectiveness and acceptability of the proposed Smart Waiting Shed and LED-Enhanced Pedestrian Lane in enhancing safety, visibility, and passenger awareness. A developmental research design was employed, involving the design, construction, and evaluation of a functional prototype. This study was conducted at Cebu Technological University–Tabuelan Extension Campus in Tabuelan, Cebu. Data were collected from 100 respondents, composed of commuters, transport operators, stakeholders, and technical experts, using a structured survey questionnaire. A five-point Likert scale was used to measure responses, and weighted means and descriptive statistics were used for data analysis. Findings revealed that the system was highly effective in sensor-activated features, safety enhancements, presence detection, signaling accuracy, monitoring, and overall reliability. Moreover, respondents rated the system as highly acceptable across indicators such as perceived usefulness, perceived ease of use, behavioral intention to use, and overall acceptability. The results suggest that integrating solar-powered lighting and smart sensing technologies into transportation infrastructure can significantly improve commuter safety and operational efficiency, particularly in rural areas with limited resources. The study recommends that local government units and transportation planners consider adopting the proposed system as part of sustainable and technology-driven transportation initiatives. Furthermore, the findings emphasize the importance of user-centered design and continuous system evaluation to ensure long-term functionality, adaptability, and effectiveness in diverse transportation environments, while supporting future innovations in infrastructure development and public safety systems for broader community impact. Keywords: commuter safety, LED-enhanced pedestrian lane, sensor-based transportation system, smart transportation, smart waiting shed, solar-powered infrastructure.

***Keywords:*** commuter safety, LED-enhanced pedestrian lane, sensor-based transportation, system, smart waiting shed, solar-powered infrastructure.

# BIOCORE INNOVATION COCO PEAT BLOCK PRODUCTION FEASIBILITY STUDY IN ALEGRIA, TUBURAN, CEBU

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## ABSTRACT

This study evaluates the technical, marketing, financial, and socioeconomic viability of **BioCore Innovation**, a partnership business based in Alegria, Tuburan, Cebu, dedicated to manufacturing **nutrient-enhanced coco peat blocks**. The initiative addresses the environmental challenge of abandoned coconut husks—which are typically burned or left to decompose—by transforming agricultural waste into a high-value, eco-friendly growing medium. The suggested product is a block of compressed coco peat mixed with vermicast, which provides excellent aeration, water retention, and natural fertility for a range of uses in hydroponics, sustainable farming, and horticulture. A market survey of 120 respondents from Tuburan, Asturias, Balamban, and Toledo was combined with technological prototyping and thorough financial modeling as part of a mixed-method research methodology. Strong market potential was shown by the survey's findings, which showed that 87% of participants were interested in buying 1-kilogram blocks that were wrapped in recyclable materials. Technically speaking, the study confirmed a production method that uses reasonably priced, locally built equipment for decorticating, boiling, drying, and compression. It achieved a daily output of 69 blocks and a line efficiency of 97.73%. The project needs Php 2,000,000 in initial funding, which will come from grants and member equity. With a benefit-cost ratio of 6.26 and profitability anticipated within two years of operation, projections show significant viability, highlighting its good investment potential. The results verify that aside from being financially viable, the company offers the community substantial socioeconomic advantages. BioCore Innovation offers a scalable and replicable approach for agricultural innovation that is in line with national development goals by giving local coconut farmers an extra source of income, generating jobs, lowering environmental pollution, and fostering a circular economy.

**Keywords:** circular economy, coco peat innovation, sustainable agriculture, vermicast enrichment, waste management

# INFUSING TECHNOLOGY OF AN AUTOMATED RAINWATER FED – HYDROPONICS SYSTEM ADD ITS ACCEPTABILITY

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## ABSTRACT

This study aimed to design, develop, and evaluate an Automated Rainwater-Fed Hydroponics System at Cebu Technological University–Tuburan Campus, focusing on its effectiveness and acceptability in terms of system performance and user adoption. The study employed a developmental descriptive research design. The developmental phase involved planning, designing, constructing, and testing the automated hydroponics system integrated with rainwater harvesting, sensors, pumps, and microcontrollers. The descriptive phase used a quantitative approach through a structured questionnaire administered to 100 purposively selected respondents, composed of 20 experts (BIT instructors and agriculture faculty) and 80 non-experts (agriculture students). The findings revealed that the Automated Rainwater-Fed Hydroponics System was both effective and acceptable, particularly in terms of functionality, efficiency, and sustainability. However, the results indicated no significant relationship between behavioral intention to use and actual usage of the system, suggesting that intention alone does not guarantee actual utilization. The lack of a significant relationship between intention and actual usage suggests that accessibility, technical skills, and operational limitations affect system adoption. A maintenance and operational program was proposed to ensure sustainability and long-term use, highlighting the system's potential as a practical and sustainable agricultural model for educational institutions.

**Keywords:** automated hydroponics, rainwater harvesting, sustainable agriculture, technology acceptability.

# ASSESING THE DEVELOPMENT OF AN AUTOMATED COFFEE SEED SEPARATOR AND ITS ACCEPTABILITY

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## ABSTRACT

This study assessed the development and acceptability of an Automated Coffee Seed Separator among coffee stakeholders in Tuburan, Cebu during the academic year 2025–2026. The research aimed to design and develop a technological solution that improves the efficiency, accuracy, and consistency of coffee seed sorting while minimizing manual labor and reducing processing time, highlighting the importance of modernizing postharvest practices to strengthen productivity and sustainability in local coffee farming communities. The study employed developmental and descriptive research designs. The prototype integrated mechanical components, optical sensors, a conveyor system, and a microcontroller-based control unit to automate the sorting process. Testing was conducted in both laboratory and farm settings with 100 purposively selected respondents, including farmers, a coffee farm owner, and agricultural office personnel. Data were collected using an adapted survey questionnaire and analyzed through frequency, percentage, weighted mean, and Pearson r correlation coefficient. The objectives included determining the technical requirements such as design specifications, detailed device plans, and estimated project cost; evaluating effectiveness in terms of features, functions, performance, reliability, safety, and maintenance; and assessing acceptability based on perceived usefulness, ease of use, behavioral intention, and actual usage. Findings showed that the device was highly effective and highly acceptable, with a significant positive relationship between effectiveness and acceptability. In conclusion, the Automated Coffee Seed Separator is a feasible, efficient, and user-friendly innovation that can improve seed quality, reduce labor dependency, increase productivity, and support sustainable coffee production.

**Keywords:** automated seed sorting, coffee post-harvest technology, agricultural engineering, technology acceptance, Tuburan coffee industry

# SENSORY EVALUATION OF CALABASH (Crescentia cujete) JUICE IN BROWNIES PRODUCTION

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## ABSTRACT

Calabash Brownies is a dessert that blends the traditional elements of brownie batter with juice derived from the fruit of the Crescentia cujete tree, merging its distinctive plant properties with classic baking components to produce a tasty and nutritionally innovative product. This study aimed to innovate brownies by enriching them with calabash juice (*Crescentia cujete*), a tropical nutritious fruit that is known for its nutritional and ethnomedical uses. In many nations, calabash has long been used as a respiratory and digestive remedy. Scientific studies have revealed that the fruit contains bioactive substances, confirming its possible functional usefulness. This study aimed to address the growing demand for healthier food alternatives and to reduce local food waste by innovating a dessert through the integration of calabash juice. A descriptive quantitative research design was employed. The study integrated an experimental method to evaluate the effects of varying levels of calabash juice on the product's quality. Three calabash juice treatments were tested for sensory attributes such as color, taste, and texture. The study also measured product perception and purchase intent through a 5-point hedonic scale. A purposive sample of 40 respondents, who are all trained specialists, evaluated the treatments using a 9-point hedonic scale. The product's safety was confirmed through microbiological evaluations that stated that staphylococcus, moisture content, and E. coli levels were significantly below standard safety limits. The cost-return analysis showed that each brownie costs Php 16.00 with a profit of Php 5.6 per piece at a 60% markup. The 57 ml calabash juice treatment (T3) received the highest ratings across all sensory attributes, with significant differences in perception for T1 and T2, but not for T3. Treatment 3 is the most acceptable variant, indicating a promising innovation in pastry development, contributing to sustainable food innovation, and integrating underutilized crops into commercially viable products. A Techno Guide was created to document the product process. The study suggests that incorporating calabash juice in brownie production creates a nutritious dessert that meets sensory and safety standards.

**Keywords:** dessert, functional food, sensory evaluation, food innovation, healthier alternatives, microbiological safety, return on investment, sustainable food innovation

# SENSORY EVALUATION AND ACCEPTABILITY OF BREADNUT SEEDS POLVORON (*Artocarpus camansi*) ENRICHED WITH LEMON PEEL (*Citrus microcarpa*)

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## ABSTRACT

This study aimed to determine the sensory attributes and overall acceptability of Breadnut Seeds Polvoron (*Artocarpus camansi*) enriched with lemon peel (*Citrus microcarpa*). The research used an experimental design to assess the effect of different concentrations of lemon peel on the product's sensory qualities. Data were collected through sensory evaluation and analyzed using the weighted mean and the Friedman statistical test. Three formulations were prepared by varying the amount of lemon peel while keeping the other ingredients constant: 60 grams of pulverized breadnut seeds, 31 grams of all-purpose flour, 60 grams of skim milk, 100 grams of powdered sugar, and 76 grams of margarine. Treatment 1 (T1) contained 3 grams of lemon peel, Treatment 2 (T2) had 6 grams, and Treatment 3 (T3) had 9 grams. The results showed that T3 obtained the highest ratings in most sensory attributes. In terms of aroma, T3 received the highest score of 4.43 (Extremely Pleasant). While appearance and taste, got 4.37 (Extremely Palatable), texture ratings ranged from 3.99 to 4.06 which all described as Very Desirable. In terms of general acceptability got 6.96, interpreted as Like Moderately. Microbiological testing showed that the product met safety standards with aerobic plate count and E. coli count of <1.0 × 10 CFU/g, while Salmonella was negative. Cost and return analysis showed a total cost of investment 284 pesos, producing 60 pieces sold at ₱7 each, resulting in a net profit of ₱136 and a return on investment (ROI) of 47.88% . Overall, the product was acceptable, safe, cost-effective, and marketable.

**Keywords:** *Breadnut Seeds Polvoron, Sensory Evaluation, Microbiological Analysis, Product Development, Tuburan Cebu*

# THE EFFECT OF BANANA BLOSSOM *(Musa acuminata*) INCORPORATION ON THE SENSORY ATTRIBUTES AND ACCEPTABILITY OF MUD CLAM MEAT (*Polymesoda erosa*) SIOPAO; TECHNOLOGY EVALUATION GUIDE

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## ABSTRACT

This study aimed to determine the effect of incorporating banana blossom (*Musa acuminata*) on the sensory attributes and acceptability of mud clam meat (*Polymesoda erosa*) siopao. Specifically, the study developed three formulations with varying proportions of banana blossom and mud clam meat and evaluated their sensory characteristics in terms of appearance, aroma, taste, and fluffiness, as well as overall acceptability. A quasi-experimental research design was employed in the study. Sensory evaluation was conducted among 50 purposively selected respondents from Cebu Technological University–Tuburan Campus, consisting of 5 trained panelists and 45 consumer evaluators. Data were analyzed using frequency, percentage, weighted mean, and Spearman's Rho Correlation Test at a 0.05 level of significance. The results revealed that Treatment 3, which contained 120 grams of banana blossom and 80 grams of mud clam meat, obtained the highest ratings in most sensory attributes, particularly in appearance, aroma, and taste. The overall acceptability of T3 is 7.29 (Likely Very Much). Microbiological analysis showed that the product met food safety standards, with Aerobic Plate Count and Total Coliform Count below 1.0 × 10 cfu/ml, while *Escherichia coli* and *Salmonella* were not detected. The findings suggest that banana blossom and mud clam meat can be utilized as safe and acceptable ingredients in the development of innovative siopao products. Based on the results of the study, a techno guide was developed to support future product development.

***Keywords:*** Banana Blossom, Microbiological Safety, Sensory Evaluation, Siopao Innovation, Techno- Guide

# EXAMINING THE DEVELOPMENT AND ACCEPTABILITY OF AN AUTOMATED SOLAR PANEL CLEANING SYSTEM

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## ABSTRACT

This study aimed to examine the development and acceptability of an Automated Solar Panel Cleaning System at Balamban, Asturias and Tuburan , focusing on its effectiveness in maintaining solar panel efficiency and its acceptance among potential users. The study utilized a developmental-descriptive research design. The developmental phase included planning, designing, fabricating, and testing the automated cleaning system integrated with temperature sensors, rain sensors, sprinkler and wiper cleaning mechanisms, ESP32 cam, and a firebase console. The descriptive phase applied a quantitative approach using a structured questionnaire administered to 50 purposively selected respondents, consisting of 20 experts (Technology Experts) and 30 non-experts (Homeowners with solar panel). Results showed that the Automated Solar Panel Cleaning System was effective and acceptable in terms of functionality, efficiency, and sustainability. However, findings revealed no significant relationship between behavioral intention to use and actual system usage, indicating that intention alone does not ensure system utilization. Factors such as accessibility, technical skills, maintenance requirements, and operational limitations may influence adoption. A maintenance and operational program was proposed to support sustainability and long-term implementation. The study highlights the system's potential as a practical and sustainable support technology for renewable energy systems in educational institutions.

**Keywords:** automated system, renewable energy maintenance, solar panel cleaning, sustainable technology, technology acceptability

# MICROBIOLOGICAL AND SENSORY EVALUATION OF PASTILLAS FORTIFIED WITH APPLE BANANA PULP (MUSA ACUMINATA)

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## ABSTRACT

Pastillas is a well-known Filipino sweet usually made from milk and sugar. In this study, it was improved by adding apple-banana pulp (*Musa acuminata*) to enhance its nutritional value. The main goal was to determine if the fortified pastillas would remain safe and acceptable to consumers. Quasi-experimental method was used to create three different formulations featuring different levels of banana pulp. The tests were evaluated by 50 experts, including NCII-certified holders and trained faculty members, and used a 9-point hedonic scale to rate color, aroma, taste, texture, and overall appearance. Microbiological tests were also conducted, such as aerobic plate count, E. coli Count and water activity to ensure food safety and product stability. The findings showed that the fortified pastillas met food safety standards and were generally well accepted. Ultimately, the study demonstrates that using apple banana makes traditional pastillas nutritious, reliable and shelf-ready product that appeals to the modern consumer market.

**Keyword:** *apple banana pulp, food innovation*, *microbiological safety, pastillas fortification, sensory evaluation*

# ASSESSING IOT-BASED WATER LEVEL AND PH MONITORING SYSTEM IN HYDROPONICS

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## ABSTRACT

Hydroponics systems, particularly Nutrient Film Technique (NFT), require precise control of pH and nutrient concentrations to optimize plant growth and prevent physiological disorders, yet manual monitoring is labor-intensive and error-prone. This study aimed to enhance an existing IoT-based hydroponics monitoring system for water level and pH control at Cebu Technological University–Tuburan Campus during the academic year 2025–2026. The upgraded system integrated real-time sensing, automated alerts, data logging, and cloud-enabled monitoring to stabilize solution chemistry and improve operational efficiency. An applied developmental research design was employed, with 50 respondents comprising 40 non-expert students and 10 expert instructors, selected through simple random and purposive sampling. Weighted mean analysis assessed the system's functional effectiveness, including features, reliability, usability, maintenance, durability, and safety/security, and its acceptability in terms of perceived usefulness, ease of use, behavioral intention, and overall acceptance. Results revealed that the enhanced IoT monitoring system was highly effective across all functional dimensions and highly acceptable to both expert and non-expert participants. The study concluded that the system significantly improved solution stability, plant growth outcomes, and operational efficiency. It is recommended that the enhanced system be adopted in schools and smallholder hydroponics setups, with supporting instructional manuals to guide usage, promote technology integration, and strengthen practical STEM-based learning and sustainable agricultural practices.

**Keywords:** *IOT hydroponics, nutrient control, pH monitoring, precision agriculturewater level sensing*

# COMMERCIAL VIABILITY OF BROILEAF FEED SUPPLEMENT BUSINESS IN TUBURAN, CEBU

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## ABSTRACT

This feasibility study assessed the viability of Broileaf, a sustainable feed supplement business in Tuburan, Cebu, utilizing locally sourced waterleaf (*Talinum triangulare*) as its primary ingredient. The research employed both descriptive and quantitative methods to ensure a comprehensive evaluation. This included conducting surveys with 133 local poultry raisers to estimate market reception, alongside thorough financial forecasting over a five-year period to project long-term sustainability. The findings revealed a strong market demand for natural alternatives, with 96.2% of respondents expressing interest in non-synthetic supplements and 71.4% indicating a likelihood to purchase Broileaf. Consumer preference leaned towards practical packaging sizes, specifically 250g and 500g options. On the operational side, the technical evaluation confirmed that efficient production is achievable through the application of lean manufacturing principles, minimizing waste while maximizing output. The financial analysis further solidified the business case, indicating profitability within two years of operation. Key metrics supporting this include a payback period of 2.21 years, a substantial return on investment (ROI) of 577.10%, and an internal rate of return (IRR) of 66.26%, all of which point to strong financial health. Essentially, Broileaf demonstrated full compliance with legal, taxation, and environmental standards. It also promotes significant socio-economic benefits, such as generating local employment and encouraging sustainable agricultural practices. The study concludes that Broileaf is both financially and operationally feasible. Strategic recommendations include focusing on marketing expansion, forming strong supplier partnerships, and maintaining rigorous environmental monitoring to ensure sustainable and scalable business growth.

***Keywords:*** *Feasibility Study, Financial Viability, Waterleaf (Talinum triangulare), Poultry Feed, Sustainable Agriculture*

# LUMEA: A FEASIBILITY STUDY OF PHOTOLUMINESCENT ROAD MARKINGS INCORPORATING EUCHEUMA (Guso) AS A BINDER FOR SUSTAINABLE ROAD SAFETY

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## ABSTRACT

Road traffic fatalities, claiming over 12,000 Filipino lives annually, represent a critical public health challenge in rural, unlit areas. This study examines LUMEA, a photoluminescent road marking paint derived from Eucheuma (Guso) seaweed, as a sustainable, energy-independent alternative to conventional lighting. Data were gathered through surveys of 121 stakeholders in Tuburan, Cebu, technical product testing, and detailed financial modeling. Findings show strong market validation, with an 85.1% endorsement rate translating to a Serviceable Available Market (SAM) of ₱64.9 million, from a Total Addressable Market (TAM) of ₱76.3 million based on 169.858 kilometers of road. The optimized formulation and production process achieved 96.03% line efficiency with a daily output of 420 liters. Financially, an initial investment of ₱2,100,000 supports projected net income growth from ₱1,281,785.41 in 2026 to ₱ 5,036,596.25 in 2030, with an Internal Rate of Return (IRR) of 97% and a payback period of 1 year and 4 months. Socio- economically, LUMEA will create 10 direct jobs, support local seaweed farming through integration within 3–5 years, and align with UN Sustainable Development Goals (SDG 3 and SDG 9). The study confirms that LUMEA is a feasible, sustainable, and transformative innovation for rural road safety, with a projected Serviceable Obtainable Market (SOM) of ₱47 million, establishing its commercial and social potential.

***Keywords:*** *Photoluminescent road marking, Eucheuma seaweed, Road safety, Sustainability*

# A FEASIBILITY STUDY OF ECOFRESH BRIQUETTE DEODORIZER AS A SUSTAINABLE CHARCOAL-AND-CITRUS X AURANTIIFOLIA SOLUTION FOR POULTRY ODOR AND SANITATION CONTROL

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## ABSTRACT

This study evaluates the feasibility of the EcoFresh Briquette Deodorizer, a non-synthetic odor-control product made from charcoal and *Citrus* × *aurantiifolia* extracts, developed to address persistent odor and sanitation problems in poultry farms. The study was conducted in Tabuelan, Tuburan, and Asturias, Cebu, involving 33 poultry farms and 100 respondents composed of 20 poultry farm owners/managers and 80 nearby residents, using a descriptive feasibility research design. Market analysis revealed that 95% of poultry farms rely primarily on routine cleaning for odor control, while only 5% utilize natural deodorizing materials. Product acceptance results showed that 95% (19/20) of respondents rated charcoal-and-lime-based solutions as effective (Weighted Mean = 4.05), and 90% (18/20) agreed that EcoFresh could significantly reduce poultry odor (Weighted Mean = 4.15). Overall purchase intention obtained a Weighted Mean of 4.35, with 100% of respondents expressing willingness to purchase the product at a selling price of ₱180.00 per unit if effectiveness is ensured. Technical analysis identified a production break-even point of 12,775 units annually, with operations scheduled for 20 days per month or 240 days per year, infrastructure and equipment costs of ₱406,464.42, and a direct material cost of ₱35.78 per unit. Financial evaluation showed an initial capitalization requirement of ₱1,200,000.00, total annual fixed costs of ₱1,402,399.34, projected break-even sales revenue of ₱2,299,545.10, and a payback period of 2 years and 5 months. The findings confirm that the EcoFresh Briquette Deodorizer is technically feasible, financially viable, and socially beneficial, offering a sustainable and cost-effective solution for poultry odor and sanitation control in rural communities.

***Keywords:*** *charcoal-based deodorizer; Citrus × aurantiifolia extract; poultry odor mitigation; non-synthetic deodorizer; feasibility analysis*

# ENHANCING THE DEVELOPMENT OF WATER DISPENSER WITH AN AUTOMATIC COINCHANGER AND ITS ACCEPTABILITY

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## ABSTRACT

This study focuses on enhancing the development of a water dispenser with an automatic coin changer and determining its acceptability among users. The system was designed to provide a more convenient, efficient, and accurate water dispensing process by integrating an automatic coin changer that enables users to easily insert coins and receive the correct change. This study is supported by the Technology Acceptance Model (TAM) developed by Fred Davis, which explains that users are more likely to accept and use a technology when they perceive it as useful and easy to use.This concept is also aligned with the Diffusion of Innovation Theory by Everett Rogers, which explains that technological innovations are more readily adopted when they provide clear advantages over existing systems. The developed system evaluates the functionality, efficiency, reliability, and user satisfaction of the enhanced device. A quantitative research design was utilized in the study, and data were collected from selected respondents using survey questionnaires and evaluation forms to assess the performance and acceptability of the system. The results of the study revealed that the enhanced water dispenser with an automatic coin changer was highly acceptable in terms of usability, convenience, and overall performance. Level of the developed product as to safety and functionality got **4.70** average, Reliability got **4.66**, Performance got **4.61**, Durability got **4.71**, Perceived Quality got **4.67** and Level of acceptability of the develop product as to Perceived Usefulness got **4.67**, Perceived Ease of Use got **4.70**, Behavioral Intention to Use **4.72**, Acceptability **4.62.**

***Keywords****: automated water dispenser, coin changer integration, technology acceptance model (TAM), diffusion of innovation, user satisfaction, vending technology*

# ASSESSING SMART ROADSIDE POST FOR REAL-TIME PEDESTRIAN CROSSING ALERTS AND DISTANCE MONITORING

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## ABSTRACT

University campuses are high-density pedestrian environments where mixed vehicles flow, and irregular driver compliance increases the risk of accidents at pedestrian crossings. This study assessed the development, effectiveness, and acceptability of a Smart Roadside Post for Real-Time Pedestrian Crossing Alerts and Distance Monitoring at Cebu Technological University–Balamban Campus during the academic year 2025–2026 as a basis for technology adoption. The system was designed to enhance pedestrian safety through sensor-based detection, real-time alert generation, and distance monitoring using visual and audible warning mechanisms. The research employed a quantitative research design involving 100 respondents composed of 80 non-expert campus users and 20 expert evaluators, selected through random and purposive sampling. Data were collected using a survey questionnaire, and analyzed using weighted mean to determine the level of effectiveness and product acceptability. The evaluation focused on system development aspects such as design, detection accuracy, alert generation, and distance measurement, as well as acceptability dimensions including perceived usefulness, perceived ease of use, behavioral intention to use, and overall acceptability. Results revealed that the Smart Roadside Post was highly effective in performing its intended safety functions and highly acceptable to both expert and non-expert respondents. The study concluded that the system is a viable pedestrian safety innovation for campus environments. It is recommended that the technology be adopted and further enhanced for implementation in campus crossings and other high-risk pedestrian areas.

**Keywords**: *smart roadside post, pedestrian crossing safety, real-time alerts, distance monitoring, campus mobility safety*

# EVALUATION OF BRINE DEGUMMING AS A PRE- TREATMENT PROCESS FOR OPTIMIZING OIL RECOVERY FOR BIODIESEL FEEDSTOCK PRODUCTION

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## ABSTRACT

This research investigates the utilization of spent coffee grounds (SCG) as a sustainable biodiesel feedstock, specifically evaluating brine degumming as an optimized pre-treatment process to enhance oil recovery and refining efficiency. The study addresses the dual challenge of organic waste underutilization and the economic strain caused by the Philippines' increasing Coconut Methyl Ester (CME) blending mandate, which is scheduled to reach 5% by 2026. Diversifying biodiesel feedstocks is essential to mitigate potential supply shortages and reduce technical constraints associated with conventional sources. To achieve these objectives, the study first determines the oil yield from SCGs using Soxhlet extraction with n-hexane and absolute ethanol at a fixed ratio of 100 grams per 500 ml of solvent. A primary focus is the comparison between conventional water degumming and an optimized brine (salt-water) degumming method to evaluate their effectiveness in maximizing refined oil yield. Following extraction and degumming, biodiesel production is carried out using a two-step transesterification process consisting of acid-catalyzed esterification followed by alkali-catalyzed transesterification to ensure high conversion efficiency and product quality. The resulting biodiesel is blended with commercial diesel at varying ratios of B5, B10, B15, and B100. The study then evaluates key physicochemical properties, including cetane number, flash point, fire point, density at 15°C, calorific value (approximately 38–39 MJ/kg), and acid number. These properties are benchmarked against international standards such as ASTM D6751 and EN 14214. By valorizing agricultural waste through optimized brine degumming, this research presents a cost-effective and sustainable pathway for producing high-quality biodiesel, contributing to improved energy security and environmental sustainability.

**Keywords**: blended biodiesel, brine degumming, physicochemical properties, spent coffee grounds, two-step transesterification

# SENSORY PROFILING AND ASSESSMENT OF POLYHERBAL INFUSION OBTAIN FROM MORINGA (*Oleifera*), MIRACLE LEAVES (*Bryophyllum pinnatum*), BASIL (*Ocimum basilicum*), TURMERIC (*Curcuma longa*), GINGER (*Zingiber officinale*), AND LEMONGRASS (*Cymbopogon citratus*)

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## ABSTRACT

This study aimed to develop and evaluate a polyherbal infusion made from Moringa, miracle leaves, basil, turmeric, ginger, and lemongrass. The research focused on determining the sensory acceptability and microbiological safety of the formulated herbal tea as a potential functional beverage derived from locally available medicinal plants. The study used a quasi-experimental research design, with three formulations of the polyherbal infusion evaluated using sensory profiling. Fifty respondents, comprising trained specialists and student consumers, assessed the product on color, aroma, taste, texture, and overall acceptability using a sensory evaluation scale. Statistical analysis was conducted using the weighted mean and the Friedman Test at a 0.05 level of significance. In addition, microbiological testing, including Aerobic Plate Count, E. coli, and total coliform count, was performed to determine the safety and quality of the developed infusion. Results from the sensory evaluation indicated high acceptability of the polyherbal tea. The overall sensory characteristics obtained an aggregate mean of 4.07, interpreted as Very Good, while the general acceptability mean score was 7.39, described as “Like Very Much.” Microbiological analysis showed an aerobic plate count of 1.0 × 10 CFU/mL, E. coli count of 1.0 × 10 CFU/mL, and total coliform count of <1.0 × 10 CFU/mL, all within the acceptable limits set by the Philippine DOH–FDA Circular No. 2013-010. These findings confirm that the developed polyherbal infusion is both sensory acceptable and microbiologically safe, indicating its potential as a nutritious and marketable herbal beverage.

**Keywords:** *Food Innovation, Microbiological Safety, Moringa oleifera, Sensory Evaluation*

# GREEN CRITICISM ON THE SUSTAINABILITY OF THE BLUE HOLE IN SAN JUAN, TUBURAN, CEBU

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## ABSTRACT

This qualitative descriptive study investigates how green efforts and sustainability practices are manifested at Blue Hole Spring in Barangay San Juan, Tuburan, Cebu, through an ecocentric lens. The research aims to uncover historical elements embedded in ecological narratives and to extract them to generate reader-centered, creative outputs that communicate environmental meaning. The study identifies the people, places, periods, and events shaping the site's narratives and documents environmental problems observed at Blue Hole Spring, along with the sustainability responses enacted to address them. Central ecocentric features emerged: the adoption of circular-economy principles, the preservation of living shorelines with native flora and mangroves, and active stakeholder engagement. Creative outputs are produced, including a promotional video, a spoken word piece titled "Hidden Beauty," and an informative brochure to raise environmental awareness and promote sustainable tourism. The study concludes by revealing a human-environment connection and sustainability as an ongoing, community-driven commitment in Tuburan Blue Hole.

**Keywords:** blue hole spring, ecocentrism, ecological narratives, sustainable tourism

# THE USE OF SLANG ON TIKTOK VLOGS AMONG TEENAGERS

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## ABSTRACT

This study explored how the language we speak is actively changing, driven by the fast-paced environment of social media platforms, Tiktok. The researchers focused on the slang used by the teenagers, examining the new words, why they use them, and the platforms' role in linguistic shift. The researchers gathered the data from thirty first-year college students from the College of Arts and Sciences (CAS). A total of three popular TikTok videos containing slang words have been analyzed through a slang dictionary. Data were collected through a test questionnaire, the data were analyzed and categorized using the framework of Allan and Burridge (2006) types and functions of slang. Findings revealed that the most collected slang was classified as "fresh and creative," that indicate that today's youth are not just recycling old words, they are actively and constantly inventing new ones. The functions of slang findings that the most usage is "to express impression" indicate that the primary role of slang in this digital age is a tool for self-expression and identity building. This study concludes that TikTok is a powerful engine for modern language change. The findings highlight the necessity for sociolinguists and educators to recognize social media platforms as the primary laboratories for linguistic innovation, essential for understanding current generational communication and identity formation.

**Keywords:** Allan and Burridge framework, digital linguistics, identity formation, linguistic innovation, sociolinguistics, Tiktok slang

# PROCESS AND SENSORY CHARACTERIZATION OF SEA URCHIN (ECHINOIDEA) ICE CREAM

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## ABSTRACT

This study examines the processing and sensory characteristics of sea urchin (*Echinoidea*) ice cream. Along with maintaining the safety and quality of the finished product, it specifically aims to establish a standardized formulation process and determine the most preferred sea urchin treatment level as well as address the consumers' increased demand for low-calorie and high-fiber foods. The study applies a quasi-experimental research design in which the sea urchin treatment level is manipulated as an independent variable. Three treatments (T1=150 g, T2=100 g & T3=50 g) are evaluated to assess their impact on the product's sensory qualities and microbiological safety. The formulation that exhibits the most promising characteristics is then subjected to microbiological assessment, including moisture content determination, E. coli testing, aerobic plate count, and *staphylococcus* analysis. Fifty (50) identified respondents, including the 40 NCII holders (teachers/students) from Cebu Technological University-Tuburan Campus, and 10 selected restaurant owners in Tuburan municipality in the academic year 2025-2026 will participate in assessing the sensory characterization to determine the consumer preference and overall acceptability of the product using a standardized 9-point hedonic scale questionnaire from Sosa et al., 2024. This study's findings are expected to serve as a foundation for the development of a Techno-Guide and contribute to the development of innovative frozen dairy products by utilizing sea urchin (*Echinoidea*) as a functional ingredient.

**Keywords:** Functional Food, Product Development, Sea Urchin (*Echinoidea*), Sensory Characterization, Techno-Guide

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*If we knew what it was we were doing, it would not be called research, would it?*

—Albert Einstein


*"Creativity is thinking up new things. Innovation is doing new things."*

—Theodore Levitt

# UNIVERSITY VISION

**CTU as a premier science and technology university in Southeast Asia.**

# UNIVERSITY MISSION

**The University is committed to providing inclusive, innovative, and internationally recognized degree programs that proactively respond to community and industry needs through the sustainable integration of its core functions, empowering multi-stakeholders to address regional and national development within the dynamic context of the global knowledge economy and the Industry 5.0.**

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Based on the University vision and mission, it will:

- ARTICULATE a sustained quality higher education system within the Philippines, in alignment with CHED SUC leveling and other national and international standards;
- DEVELOP innovative, industry-responsive academic programs that foster strong local, national, and international partnerships with key stakeholders (students, faculty, industry, community and academic partners), aligned with regional, national, and global development priorities;
- VITALIZE internal resource-generation and technopreneurship initiatives driven by its intellectual assets to ensure the university's long-term financial sustainability and growth;
- ACHIEVE and sustain high national and international university rankings through excellence in instruction, research, extension and production;
- NURTURE comprehensive information technology, physical infrastructure, and human resource development programs aimed at enhancing talent, professional growth, and institutional capability to attain optimal operational efficiency;
- CULTIVATE a culture of disaster-resilient and sensitized community guided by innovation, excellence, and world-class standards; and
- ENGAGE actively in sustainable practices and impactful community collaboration aligned with cultural preservation and valuing humanity as the innermost core of society.