สมาคมนวัตกรรมและเทคโนโลยีสร้างสรรค์ ร่วมกับ มหาวิทยาลัยเทคโนโลยีราชมงคล ทั้ง 9 แห่ง
Innovation and Creative Technology Association & Rajamangala University of technology

RMUTCON 2025

ABSTRACT BOOK

THE 13TH RAJAMANGALA UNIVERSITY OF TECHNOLOGY INTERNATIONAL CONFERENCE

9 RMUT: DRIVING SOCIAL INNOVATION TOWARDS SUSTAINABLE DEVELOPMENT
JULY 22 - 24, 2025

RMUTCON 2025
14TH RMUTNC & 13TH RMUTIC / 6TH RMUT INNOVATION AWARDS 2025

Abstract Book
The 13th Rajamangala University of Technology International Conference

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Abstract Book

The 13th Rajamangala University of Technology International Conference
9 RMUT: Driving Social Innovation Towards Sustainable Development

July 22 - 24, 2025
Asawin Grand Convention Hotel, Bangkok

Organized by

- Creative Innovation and Technology Association
- Rajamangala University of Technology Phra Nakhon
- Rajamangala University of Technology Krungthep
- Rajamangala University of Technology Rattanakosin
- Rajamangala University of Technology Thanyaburi
- Rajamangala University of Technology Tawan-ok
- Rajamangala University of Technology Isan
- Rajamangala University of Technology Lanna
- Rajamangala University of Technology Suvarnabhumi
- Rajamangala University of Technology Srivijaya

Published by Rajamangala University of Technology Phra Nakhon

Abstract Book:
The 13th Rajamangala University of Technology International Conference
9 RMUT: Driving Social Innovation Towards Sustainable Development

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Preface

The Association of Innovation and Creative Technology, together with Rajamangala University of Technology Phra Nakhon, is honored to host the 14th Rajamangala University of Technology National Conference (14th RMUTNC), the 13th Rajamangala University of Technology International Conference (13th RMUTIC), and the 6th RMUT Innovation Awards 2025. These events will take place from July 22–24, 2025, at Asawin Grand Convention Hotel, Laksi District, Bangkok.

This conference provides a platform to share research, inventions, and innovations from faculty, researchers, students, and staff across all nine Rajamangala Universities of Technology. It also welcomes participants from other institutions and organizations in Thailand and abroad. The goal is to promote the exchange of knowledge, experiences, and academic ideas among researchers, scholars, and stakeholders, leading to the development of practical innovations for the country's sustainable economic and social growth.

Rajamangala University of Technology Phra Nakhon, as the host, would like to sincerely thank all administrators, organizing committees, distinguished experts, and participants for their valuable support and contributions to this event.

We hope this conference will inspire new ideas, expand knowledge, and encourage meaningful collaborations that will benefit the nation in the future.

Rajamangala University of Technology Phra Nakhon
July 2025

Message from Ms. Sudawan Wangsuphakijkosol
Minister of Higher Education Science Research and Innovation

The Ministry of Higher Education, Science, Research and Innovation (MHESI) is dedicated to advancing higher education to meet the demands of a rapidly changing world. By fostering research and innovation within universities and promoting collaboration across all sectors—both nationally and internationally—the Ministry underscores its commitment to driving sustainable development that aligns with the nation's strategic goals.

Recognizing the crucial role of research and innovation in responding to the needs of communities and society, MHESI has placed these elements at the heart of its mission. The 14th National RMUT Conference, the 13th International RMUT Conference, and the 6th RMUT Invention and Innovation Contest, held under the theme "Innovation for Society: 9 RMUTs Driving Development towards Sustainability", stand as significant milestones. These events showcase the outcomes of rigorous academic inquiry and creative innovation from researchers, academics, and students, while fostering knowledge exchange and collaboration at national and international levels.

On behalf of the Ministry, I extend my heartfelt congratulations to the Association of Innovation and Technology, the nine Rajamangala Universities of Technology, and all supporting organizations for their collective efforts in organizing these important events. This collaboration reflects the pivotal role of higher education institutions in developing innovations that are deeply connected to and beneficial for communities and society.

I am confident that RMUTCON 2025 will achieve outstanding success and lead to meaningful outcomes—transforming academic research into valuable innovations that contribute to the well-being of communities, strengthen society, and advance national development.

Ms. Sudawan Wangsuphakijkosol
Minister of Higher Education Science Research and Innovation

Message from Professor.Dr.Supachai Pathumnakul Permanent Secretary, Ministry of Higher Education, Science, Research and Innovation

The Ministry of Higher Education, Science, Research and Innovation (MHESI) is steadfast in its commitment to advancing the development of the nation's human capital. Our goal is to equip individuals with the knowledge, skills, and competencies necessary to thrive in the 21st century, enabling them to contribute effectively to national progress. Central to this endeavor is the application of science, research, and innovation as catalysts for sustainable development, ensuring that progress aligns with both societal needs and environmental stewardship.

In alignment with this vision, the Ministry emphasizes the importance of data-driven decision-making and the strategic utilization of knowledge within universities of technology. These institutions are expected to take a leading role in driving technological advancement and fostering innovation, which are critical components for improving quality of life, safeguarding the environment, and achieving the United Nations Sustainable Development Goals (SDGs). Of particular relevance is SDG 9—"Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation"—which underscores the essential role of higher education in supporting resilient and sustainable national development.

The Ministry is pleased to acknowledge the collaborative efforts of the nine Rajamangala Universities of Technology and their dedicated partners in organizing three significant events: the 14th International Conference on Technology and Innovation for Sustainable Development, the 13th National Conference on Technology and Innovation, and the 6th Rajamangala University of Technology National Conference (RMUTCON 2025). These gatherings provide a vital platform for scholars, researchers, and practitioners to share knowledge, exchange ideas, and present groundbreaking research findings that offer tangible benefits to society.

It is my sincere hope that RMUTCON 2025 will serve as a catalyst for fostering innovation and academic excellence, inspiring participants to create impactful knowledge and solutions that address the pressing challenges of our time. May these collective efforts continue to drive forward innovation-led development and promote sustainable progress for the nation and beyond.

Prof. Dr.Supachai Pathumnakul
Permanent Secretary Ministry of Higher Education,
Science, Research and Innovation

Message from the Chairman of the Rajamangala University of Technology Presidents Council

By Assoc.Prof.Dr. Udomvit Chaisakulkiet

President of Rajamangala University of Technology Rattanakosin

Chairman of the Rajamangala University of Technology Presidents Council

On behalf of the Rajamangala University of Technology Presidents Council, I would like to express my heartfelt appreciation for the organization of the 14th Rajamangala University of Technology National Conference, the 13th International Conference, and the 6th RMUT Innovation and Invention Contest under the theme "Innovation for Society: 9 Rajamangala Universities Driving Sustainable Development." This reflects the significant role of the nine Rajamangala University of Technology institutions in collaboratively advancing research, technology, and innovation to strengthen the nation's capacity based on knowledge and sustainability.

Rajamangala University of Technology Phra Nakhon has been honored as the main host, in collaboration with the eight other Rajamangala University of Technology institutions and the Association of Creative Innovation and Technology. The event features a variety of key activities, including special lectures by invited speakers, national and international academic conferences, innovation and invention contests, RMUT Startup presentations, the RMUT IP Fair exhibition, business matching sessions, and academic showcases from educational institutions and organizations both within and outside the network. This conference serves as an important mechanism to foster academic collaboration and provides a platform for the exchange of knowledge among researchers, scholars, students, as well as representatives from government, private, and civil society sectors, both domestically and internationally. Such integration of knowledge will further the development of technologies, innovations, and research that can be applied practically and sustainably.

I extend my sincere thanks to all parties involved in organizing this event. I reaffirm the Rajamangala University of Technology network's commitment to continuously driving knowledge and innovation for the benefit of society. It is my earnest hope that this conference will serve as a vital force in enhancing the quality of the nation's research and innovation, contributing sustainably to society, the nation, and the global community.

Assoc.Prof.Dr. Udomvit Chaisakulkiet
Chairman of the Rajamangala University of Technology Presidents Council

Message from the Chairperson of the Rajamangala University of Technology Research and Development Institute Network

By Asst.Prof.Dr.Bowonkitti NekomanurakDirector
Research and Development Institute, Rajamangala University of Technology Rattanakosin Chairperson,
Research and Development Institute Network, Rajamangala University of Technology

The Research and Development Institute Network of the nine Rajamangala Universities of Technology has continuously collaborated to promote, support, and develop the management of research to enhance the quality of research outputs, inventions, and innovations. These efforts aim to produce tangible benefits for communities and the nation, both in the fields of social sciences and industry. This is achieved through multi-sectoral cooperation, integrating knowledge to deliver concrete outcomes.

This conference serves as a vital platform for exchanging academic knowledge and showcasing the research and innovation potential of all nine Rajamangala Universities of Technology. It also creates an opportunity for networking and brainstorming among faculty members, researchers, and students at both national and international levels. Such interactions will inspire the development of new research, inventions, and innovations that can truly address the country's sustainable development goals.

On behalf of the Chairperson of the Rajamangala University of Technology Research and Development Institute Network, I extend my heartfelt thanks to Rajamangala University of Technology Phra Nakhon for hosting this event, as well as to all stakeholders involved in its strong organization. I firmly believe that this conference will be another powerful driver in advancing research, inventions, and innovations toward wider recognition and contributing positively and sustainably to society and the nation.

Asst.Prof.Dr.Bowonkitti Nekomanurak
Chairperson, Research and Development Institute Network,
Rajamangala University of Technology

Message from Dr. Natworapol Rachsiriwatcharabul
President of Rajamangala University of Technology Phra Nakhon (RMUTP)

The network of nine Rajamangala Universities of Technology has continuously collaborated in organizing academic conferences. This year, Rajamangala University of Technology Phra Nakhon is honored to serve as the main host, in partnership with the Association of Creative Innovation and Technology, for the 14th National Rajamangala University of Technology Academic Conference, the 13th International Rajamangala University of Technology Academic Conference, and the 6th Rajamangala Innovation and Invention Contest (RMUTCON 2025). The theme of the event, "Innovation for Society: 9 Rajamangala Universities Driving Development Towards Sustainability," reflects the role of higher education institutions in the contemporary era, not limited to teaching and learning but extending to applying knowledge for research and innovation to solve societal problems, meet community needs, and serve as a crucial force in driving the nation toward stable and sustainable development.

This academic conference not only serves as a platform for faculty members, researchers, and students to present their research but also provides an excellent opportunity to exchange knowledge and experiences with academics from both domestic and international institutions, thereby fostering global academic collaboration networks.

On behalf of Rajamangala University of Technology Phra Nakhon, I would like to express my sincere gratitude to all sectors involved in making this conference a success. May this event be a significant step forward in academic cooperation and serve as an inspiration for all participants to continue creating meaningful and impactful work for society.

Dr.Natworapol Rachsiriwatcharabul
President, Rajamangala University of Technology Phra Nakhon

The 13th Rajamangala University of Technology International Conference 9 RMUT: Driving Social Innovation Towards Sustainable Development

July 22 - 24, 2025
Asawin Grand Convention Hotel, Bangkok

Rationale

Rajamangala University of Technology Phra Nakhon is an institution of higher learning committed to cultivating practice-oriented graduates equipped with advanced knowledge and expertise in science and technology. The University has established a comprehensive vision, mission, strategic priorities, and clearly defined objectives that align with Group 2 of the strategic higher education institutions, which focus on technological advancement and the promotion of innovation. Emphasis is placed on enhancing teaching and learning, research, and innovation development as mechanisms to propel the nation's targeted industries. These endeavors are further reinforced by efficient organizational management, research capacity-building, and the fostering of innovation ecosystems.

The academic conference is organized to serve as a platform for the dissemination of research findings, inventions, and innovations produced by university personnel, as well as a medium for showcasing the institution's scholarly contributions to the broader public. Additionally, the event provides opportunities for faculty members and researchers to engage in academic exchange, strengthen collaborative networks in research and academic services, and cultivate a dynamic research environment. These efforts are aimed at generating impactful research, fostering technological advancement, and producing knowledge that contributes to societal and national development. As part of its core mission, the University's Office of Research and Development is tasked with organizing the Rajamangala University of Technology National Conference in collaboration with the network of nine RMUT institutions. Past conferences have been hosted as follows:

1. **10th RMUT National Conference**
   Theme: "Rajamangala Driving Innovation Forward Towards Thailand 4.0"
   Date: 1–3 August 2018
   Venue: Rua Rasada Hotel, Trang Province
   Host: Rajamangala University of Technology Srivijaya
2. **11th RMUT National Conference**
   Theme: "Rajamangala Innovation Pathways for Economic and Social Advancement"
   Date: 24–26 July 2019
   Venue: Chiang Mai International Exhibition and Convention Centre
   Host: Rajamangala University of Technology Lanna
3. **12th RMUT National Conference**
   Theme: "Nine RMUTs Driving Innovation, Leading Economic Development, and Fostering Green Technology for Sustainable Growth"
   Date: 18–20 May 2022
   Venue: Royal Cliff Grand Hotel, Chonburi Province
   Host: Rajamangala University of Technology Thanyaburi
4. **13th RMUT National Conference**
   Theme: "Nine RMUTs Empowering Sustainable Innovation and Shaping Future Lifestyles through the BCG Model"
   Date: 30 August – 1 September 2023
   Venue: Nongnooch Tradition Center Hall, Nongnooch Tropical Garden, Chonburi Province
   Host: Rajamangala University of Technology Tawan-ok

In 2025, Rajamangala University of Technology Phra Nakhon, in collaboration with eight other RMUTs and the Association of Innovation and Creative Technology, will assume the role of host for the following events:

- The 14th Rajamangala University of Technology National Conference
- The 13th Rajamangala University of Technology International Conference
- The 6th RMUT Innovation Awards

These will be held under the overarching theme:

"Innovation for Society: 9 RMUTs Driving Development Towards Sustainability"

Key Activities

- Special lectures by distinguished guest and keynote speakers
- National and international academic paper presentations
- Invention and innovation competitions
- RMUT Startup project showcases and competitions
- RMUT IP Fair and business matching activities
- Academic exhibitions featuring research and innovation outputs from all nine RMUTs and partner institutions

This academic gathering will serve as a significant venue for the exchange of scholarly knowledge and research experiences among academics, researchers, and professionals from the public and private sectors. Furthermore, it aims to promote the dissemination and application of research-based knowledge and innovation in practical settings, thereby fostering the development of high-impact, quality research.

Objectives

1. To provide a platform for the presentation and dissemination of research, inventions, and creative innovations in the fields of science, technology, humanities, and social sciences at both national and international levels by faculty members, researchers, students, and academic personnel from within and beyond the RMUT network.
2. To strengthen academic cooperation and promote the exchange of knowledge and experiences among researchers from the nine RMUTs and external academic institutions.

Conference Activities

1. National and international academic presentations
   - Oral presentation sessions
   - Poster presentation sessions
2. Invention and innovation competitions
3. RMUT Startup competitions
4. RMUT IP Fair and business matching sessions
5. Academic exhibitions by RMUTs and partnering organizations
   Session 1 Humanities and Social Sciences
   Session 2 Agricultural and Food Innovation
   Session 3 Science and Engineering Technology
   Session 4 Architecture and Creative Works
   Session 5 Business and Economics

Fields Open for Submission Topics for Oral Presentation and Poster Presentation

National Level — Divided into 7 sessions as follows:

- Session 1: Humanities and Social Sciences
- Session 2: Agricultural Technology and Food Innovation
- Session 3: Engineering
- Session 4: Science and Information Technology
- Session 5: Architecture, Arts, and Creative Works
- Session 6: Business Administration and Economics
- Session 7: Routine to research

International Level — Divided into 6 sessions as follows:

- Session 1: Humanities and Social Sciences
- Session 2: Agricultural and Food Innovation
- Session 3: Science and Engineering Technology
- Session 4: Architecture and Creative Works
- Session 5: Business and Economics
- Session 6: Resource Management

Topics for the Invention, Innovation, and RMUT Startup Competition

Eligible participants: faculty members, students, and the general public.

- Group A: Food Technology and Food Innovation
- Group B: Engineering and Technology
- Group C: Science and Information Technology
- Group D: Architecture, Arts, and Design
- Group E: Quality of Life Development and Creative Economy

Awards for Poster and Oral Presentation Competitions

The following distinctions were conferred in recognition of outstanding performance in the Poster and Oral Presentation categories:

1. **Gold Award**: Recipients were awarded a gold medal and a certificate of achievement.
    - National Level: 7 awards
    - International Level: 5 awards
2. **Silver Award**: Recipients were awarded a silver medal and a certificate of achievement.
    - National Level: 7 awards
    - International Level: 5 awards
3. **Bronze Award**: Recipients were awarded a bronze medal and a certificate of achievement.
    - National Level: 7 awards
    - International Level: 5 awards

Awards for the Invention and Innovation Competition

Category: Faculty Members and the General Public

1. **Gold Award**: Recipients received a commemorative plaque, a gold medal, and a monetary prize of 8,000 THB (5 awards).
2. **Silver Award**: Recipients received a silver medal and a monetary prize of 4,000 THB (5 awards).
3. **Bronze Award**: Recipients received a bronze medal and a monetary prize of 2,000 THB (5 awards).

Category: Students

1. **Gold Award**: Recipients received a commemorative plaque, a gold medal, and a monetary prize of 5,000 THB (5 awards).
2. **Silver Award**: Recipients received a silver medal and a monetary prize of 2,500 THB (5 awards).
3. **Bronze Award**: Recipients received a bronze medal and a monetary prize of 1,500 THB (5 awards).

RMUTP Startup Competition Awards

Category: Students

1. **Gold Award**: The recipient was awarded a commemorative plaque, a gold medal, and a monetary prize of 5,000 THB (1 award).
2. **Silver Award**: The recipient was awarded a silver medal and a monetary prize of 2,500 THB (1 award).
3. **Bronze Award**: The recipient was awarded a bronze medal and a monetary prize of 1,500 THB (1 award).

Note: All awardees will receive a certificate of achievement.

Tentative Schedule for the National and International Academic Conference (14th Rajamangala University of Technology National Conference – RMUTNC, and 13th Rajamangala University of Technology International Conference – RMUTIC)

Period	Activity
15 June 2025	Notification of review results
25 June 2025	Deadline for submission of final revised papers
25 June - 20 July 2025	Early bird registration for paper presenters
10 - 20 July 2025	Regular registration for paper presenters
1–15 July 2025	Submission of oral presentation files
22–24 July 2025	RMUTCON 2025 Academic Conference

Tentative Schedule for the 6th Rajamangala Innovation Awards and RMUT Startup Award

Period	Activity
15 June 2025	Announcement of shortlisted entries (preliminary selection results)
25 June - 10 July 2025	Early bird registration fee payment
10 - 20 July 2025	Regular registration fee payment
21 July 2025	Installation of exhibition booths for innovations, inventions, and startups
22–24 July 2025	RMUTCON 2025 Academic Conference and Innovation Exhibition

Venue
Asawin Grand Convention Hotel
88 Vibhavadi Rangsit Road (Kamphaeng Phet 6), Talat Bang Khen Subdistrict, Lak Si District, Bangkok, Thailand.

Conference Website: https://rmutcon2025.rmutp.ac.th/

Schedule

The 14th Rajamangala University of Technology National Conference
The 13th Rajamangala University of Technology International Conference
The 6th Innovation and Invention Contest (RMUTCON 2025)
22 – 24 July 2025
At Asawin Grand Convention Hotel, Grand Conference Room, 4th Floor, Bangkok

Tuesday, 22 July 2025		
Opening Ceremony		
Time	**Details**	**Venue**
08.30 – 09.00 a.m.	Registration for invited guests/media/speakers	Grand Conference Room A B C, 4th Fl.
09.00 – 09.10 a.m.	Opening Performance	
09.10 – 09.30 a.m.	**Opening Ceremony** - Dr. Natworapol Rachsiriwatcharabul, President of Rajamangala University of Technology Phra Nakhon, delivers the report. - Lt. Gen. Chainaronk Kijrungrojjarean, Acting President of the University Council, presides over and officially opens the conference.	
09.30 – 10.15 a.m.	**Special Lecture: "Developing Technological Human Resources through Teaching, Research, and Social Needs"** by Prof. Dr. Yuttana Kumsuwan, Faculty of Engineering, Chiang Mai University	
10.15 – 11.00 a.m.	**Special Lecture: "The Language of Change: How Communication Powers Sustainable Social Innovation"** by Assoc. Prof. Dr. Jinlong Zhang, Director of Media Practice Teaching Center, Yangtze Normal University, People's Republic of China (PRC).	
11.00 – 12.00 a.m.	**Exhibition and Poster Presentations of Research, Innovation, and RMUT Startups** by the Chairperson and Executive Teams	
12.00 – 01.30 p.m.	Lunch	3rd Fl.
Project and Contest Presentations		
Time	**Details**	**Venue**
09.00 a.m. – 05.00 p.m.	RMUT Startup Contest Presentations	Meeting Room, 2nd Fl.
01.00 – 05.00 p.m.	Oral Presentations: Technology and Innovation (national and international levels)	Meeting Room, 2nd Fl.
01.00 – 05.00 p.m.	- Poster Presentations: Technology and Innovation (national and international levels) - Innovation and Invention Contest Presentations - Academic Exhibition	Grand Conference Room A, 4th Fl.

Wednesday, 23 July 2025		
Project and Contest Presentations		
Time	**Details**	**Venue**
08.30 – 12.00 a.m.	Oral Presentations: Technology and Innovation (national and international levels)	Meeting Room, 2nd Fl.
09.00 – 12.00 a.m.	- Poster Presentations: Technology and Innovation (national and international levels) - Innovation and Invention Contest Presentations - RMUT Startup Presentations - Academic Exhibition	Conference Room A, 4th Fl.
09.00 – 12.00 a.m.	E-Sports Competition: Arena of Valor (ROV)	Grand Hall B C, 4th Fl.
12.00 – 01.30 p.m.	Lunch	3rd Floor
01.00 – 05.00 p.m.	Oral Presentations: Technology and Innovation (national and international levels)	Meeting Room, 2nd Fl.
	- Poster Presentations: Technology and Innovation (national and international levels) - Innovation and Invention Contest Presentations - RMUT Startup Presentations - Academic Exhibition	Conference Room A, 4th Fl.
06.00 – 10.00 p.m.	Welcome Party	Grand Conference Room B C, 4th Fl.
Thursday, 24 July 2025		
Closing Ceremony		
Time	**Details**	**Venue**
08.30 – 09.00 a.m.	Registration for invited guests/award recipients	Grand Conference Room B C, 4th Fl.
09.00 a.m. – 04.00 p.m.	**Closing Ceremony** - Launching Ceremony: "Innovation Partnership" by Association and related organizations - Award Presentations for Oral and Poster Presentations - Award Presentations for Innovation and Invention Contest - RMUT Startup Awards - Closing Remarks by Dr. Natworapol Rachsiriwatcharabul, President of Rajamangala University of Technology Phra Nakhon - Handover of the RMUTCON 2026 host flag	Grand Conference Room B C, 4th Fl.

Note : Coffee breaks : 10.30 – 10.45 a.m. and 02.30 – 02.45 p.m.
Lunch : 12.00 – 01.30 p.m.

List of International Abstracts

SESSION 1

Humanities and Social Sciences

The Analysis on Writing Errors of 2nd Undergraduate Students at English Department, Faculty of Linguistics and Humanities, Savannakhet University, Lao People's Democratic Republic

Pakaysit Keomanyvanh[a], Wichai Pornmalairungruaeng[b*], Lanta Ketoukham[a], Khounkham Nanthavongsa[a], Souvantha Keovongsa[a], Dalavone Vonghibouth[a]

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Abstract

Writing is one of the most important skills in learning a new language. It can open up a world of possibilities for any student. Writing is one of the two productive skills in learning English that comes after speaking. As a productive skill, many college and university students struggle to master English writing. Researchers found that differences in English cause some problems that happen in students' English writing, and they do not know well how to make a good writing, lack vocabulary and errors made by students because grammatical errors especially sentence structure, words order, punctuation, spelling, subject-verb agreement. The purpose of this study was 1) to find out cause of errors students' writing at Department of English, Faculty of Linguistics and Humanities, Savannakhet University, 2) to explore the types of errors those are typical in their writing paragraph and 3) to identify the frequency of writing errors performed by English students as well. This study focused on writing paragraphs because the researchers found that errors in English students' paragraphs. The research used the mixed-method research design. The instruments used writing paragraphs for the students' writing assignment to identify the frequency of writing errors and questionnaires to find the error analysis of writing errors on the English written paragraphs. The result indicated that the most frequently committed errors were punctuation, while the least frequent performed errors were third person singular. Punctuations were the most frequently made error type (11.50%). Other error types were verb tenses (9.90%), word choices (9.58%), preposition (8.62%), capitalization (8.62%), spelling (8.30%), subject verb agreement (7.02%), fragment (6.38%), article (6.38%), using singular and plural forms (6.38%), words order (5.43%), run on sentences (4.79%), and third person singulars (1.59%). Several recommendations are put in the highlight to reduce further problems regarding writing English paragraphs.

Keywords: Analysis, Writing, Errors, Undergraduate Students

Learning with PRIDE: A Decade of English Camp Innovation and Student Empowerment

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Abstract

Over ten years of managing English camps at Rajamangala University of Technology Krungthep (RMUTK) led to the creation of the PRIDE model, which includes planning, role preparation, idea exchange, doing, and evaluating. The model began as a support system for rural students to learn English, as well as a means for undergraduates to gain practical experience, and has evolved into a recognized method for promoting experiential learning and developing 21st-century competencies. The PRIDE Model combines theoretical classroom instruction with practical application by applying Kolb's experiential learning theory (1984) alongside Dewey's philosophy of experiential learning (1938). This paper defines the theoretical background of the model and details its practical application while demonstrating its usefulness as a structured framework for student development within higher education, especially for language learning and soft skills development.

Keywords: The PRIDE Model, Experiential Learning, 21st-Century Education

Moral Lessons in Children's Literature: A Content Analysis of Ethical Themes in *Charlotte's Web* for Higher Education

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Abstract

This research investigates the ethical components present in E. B. White's *Charlotte's Web*. The study uses qualitative content analysis to explore E. B. White's *Charlotte's Web* as a potential educational resource for teaching moral values in university settings. The research applies normative ethical theories, including virtue ethics, deontology, and utilitarianism, to reveal key moral themes like self-sacrifice, empathy, loyalty, and moral courage present in the narrative. The research outcomes reveal the transmission of core values via character evolution alongside symbolic visuals and storytelling that evoke emotions. The research examines how children's literature functions as a tool to enhance ethical reflection and moral reasoning while supporting character education at higher education institutions. The report outlines strategies to incorporate literary ethical understanding into diverse academic programs and to develop students' critical thinking using stories as educational tools. According to the study, children's literature likes *Charlotte's Web* functions as an important tool for developing ethical awareness and comprehensive educational experiences in school settings.

Keywords: Charlotte's Web, Ethical Themes, Children's Literature, Moral Education

The Study of Problems found in the workplace during Co-operative Education of students from Rajamangala University of Technology Rattanakosin Bophit Phimuk Chakkrawat Campus

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Abstract

The purpose of this research is to study the problems encountered by cooperative education students from the Faculty of Liberal Arts and the Faculty of Business Administration at Rajamangala University of Technology Rattanakosin, Bophit Phimuk Chakkrawat campus, during their work placements, as well as how the students addressed these problems. The research employed survey methods and data collection through cooperative education reports and semi-structured interviews. The results indicated two key findings. First, the problems faced by students could be categorized into four main aspects: (1) problems related to work content and work performance, (2) problems with equipment usage, (3) language-related problems, and (4) personal or life-related problems, including adjustment issues in the workplace. Second, the strategies students used to solve these problems included independent problem-solving, seeking assistance from workplace mentors, and requesting support from supervising teachers. The findings from this research can serve as useful guidelines for preparing students for the workplace. They can also inform teaching and learning management, as well as curriculum development, to better equip students for the demands of professional environments.

Keywords: Co-operative Education, Problems in Cooperative Education Practice, Cooperative Education Problem Solving Guidelines

Exploring the Educational Adaptation of Asian Art and Design Students in Wisconsin and Milwaukee: A Framework for Smart Learning and Cross-Cultural Innovation under Thailand 4.0

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Abstract

This article explores the educational adaptation of Asian students enrolled in art, design, and craft programs at universities and vocational institutions in Wisconsin, with a focus on institutions such as the University of Wisconsin–Milwaukee (UWM) and the Milwaukee Institute of Art & Design (MIAD). Although creative disciplines like fashion, product design, illustration, and craft have seen increasing international enrollment, Asian students often encounter structural and cultural challenges within studio-based pedagogical environments that demand critique, self-direction, and cultural fluency (Kim, Lee, & Cho, 2021) The purpose of this article is threefold: (1) to examine the cultural and academic adaptation of Asian students in Wisconsin's creative education sector, (2) to identify adaptive patterns across disciplinary contexts, and (3) to propose a conceptual framework integrating smart learning ecosystems and cross-cultural adaptation theory in line with Thailand's policy agenda, Thailand 4.0 (Office of the Prime Minister, 2020). This article frames smart learning tools not as supplementary technologies but as core frameworks for design pedagogy, enabling personalized feedback, collaborative critique, and adaptive learning, especially within international studio-based education. The discussion positions Thailand 4.0 as a national education reform strategy that prioritizes innovation, digital fluency, and interdisciplinary learning. Moreover, the cultural and academic adaptation of international design students is situated as part of a broader effort to develop global human capital through inclusive and responsive education. The article employs an integrative conceptual inquiry approach by synthesizing qualitative case studies, institutional data, and theoretical models from international education, design pedagogy, and intercultural communication. The findings from this synthesis are expected to inform the development of globalized curricula, enhance institutional support structures, and promote inclusive, culturally responsive pedagogies in non-metropolitan creative education hubs.

Keywords: Art and Design Education, Cross-Cultural Adaptation, Asian International Students, Smart Learning, Thailand 4.0

Applying the Theory of Planned Behavior to Understand Electric Vehicle Purchase Intentions in Phra Nakhon Si Ayutthaya

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Abstract

This study aims to examine the influence of three key factors—attitude toward the behavior, subjective norms, and perceived behavioral control on the intention to purchase electric vehicles (EVs) in Phra Nakhon Si Ayutthaya Province. The research framework is based on the Theory of Planned Behavior (TPB). The sample group consisted of 400 individuals aged between 20 and 59 years (Generation X and Y), residing in Phra Nakhon Si Ayutthaya, selected using a convenience sampling method. A questionnaire was used as the data collection tool. The data were analyzed using descriptive statistics, analysis of variance (ANOVA), and multiple regression analysis. The results revealed that most respondents were female, aged between 20–29 years, single, held a bachelor's degree, worked in private companies, and had a monthly income of less than 15,000 baht. The three main factors—attitude, subjective norms, and perceived behavioral control—were rated at a high level of agreement. Furthermore, demographic variables including age, marital status, and monthly income showed statistically significant differences in the intention to purchase EVs at the .05 significance level. The three psychological factors together were found to explain 59.3% of the variance in purchase intention, also statistically significant at the .05 level.

Keywords: Electric Vehicles, Theory of Planned Behavior, Purchase Intention, Demographics

SESSION 2

Agricultural and Food Innovation

Influence of fertigation on growth, yield, and ratooning ability of sugarcane (*Saccharum officinarum* L.) var. Khon Kaen 3

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Abstract

This research aimed to compare the effects of drip irrigation and fertilizer application on growth, root length density (RLD), yield, and yield components of sugarcane and to evaluate their impacts on ratooning ability. To achieve this objective, sugarcane cultivation practices were conducted in sandy clay loam soil over two years. The effects of drip irrigation, drip fertigation, and rainfed conditions on growth, yield, irrigation water use efficiency (IWUE), and fertilizer nutrient use efficiency (FNUE) were compared in plant crops. The results showed that the drip fertigation treatment could produce the highest growth and yield. In the first ratoon crop (FRC), the effect of plant crop practices on the adaptation of FRC was evaluated by splitting the treatments of plant crops into two different practices: rainfed condition and drip fertigation. Growth, yield, and RLD were evaluated as indicators of the ratooning ability of the ratoon crop. The results showed that the previous crop practices for the plant crop of sugarcane did not affect the ratoon crop performance. For the FRC practice, drip fertigation exhibited the highest growth, yield, and ratooning ability. However, the RLD in both years of rainfed treatments was higher than in the drip irrigation treatments.

Keywords: Drip Irrigation, Ratooning Potential, Saccharum Officinarum, Root Distribution, First Ratoon Cane

Utilization of Pectin from Pomelo Peel as the Stabilizer in Synbiotic Yogurt

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Abstract

This study aimed to determine the optimal conditions for pectin extraction from pomelo peel using two types of acid solvents—citric acid and acetic acid—at concentrations of 1% and 5%, a temperature of 60°C, and durations of 30 and 120 minutes. The results indicated that extraction with 5% citric acid yielded a higher quantity of pectin compared to acetic acid. However, galacturonic acid analysis revealed that extraction with 5% acetic acid for 30 minutes resulted in the highest galacturonic acid content (91.94 ± 5.40%), signifying high purity. This was consistent with methoxyl content values ranging between 13.75% and 15.23%. Consequently, 5% acetic acid extraction for 30 minutes was selected as the optimal method, as it produced a comparable pectin yield and chemical properties to the 120-minute extraction while requiring less time. The extracted pectin was incorporated into yogurt at concentrations ranging from 0.2% to 0.5% (w/w), where a concentration of 0.2% (w/w) proved most effective in reducing yogurt syneresis. Synbiotic yogurt was developed by adding 0.2% (w/w) pectin as a stabilizer, *Bifidobacterium* as a probiotic, and inulin at concentrations of 1%, 1.5%, 2%, and 2.5% (w/w). The synbiotic yogurt formulations (S4, S5, S6, S7) exhibited similar syneresis, acidity, and color to the control yogurt (S1). Among these, formula S5 demonstrated the lowest syneresis and showed no significant difference in color compared to the control during 15 days of cold storage. Lactic acid bacteria (LAB) counts and *Bifidobacterium* probiotic counts remained stable throughout the storage period. The synbiotic yogurt formulation S7, containing 2.5% inulin, received the highest sensory acceptance scores compared to other formulations (S4, S5, S6) on both day 0 and day 15. In conclusion, a novel synbiotic set yogurt with desirable quality was successfully developed using pomelo peel-derived pectin as a stabilizer for delivering the probiotic *Bifidobacterium*. This product not only provides health benefits but also contributes to reducing fruit market waste.

Keywords: Pectin, Pomelo Peel, Inulin, Bifidobacterium, Synbiotic Set Yogurt

Enhancing Cassava Yield and Water Use Efficiency Through Drip Irrigation Controlled by Wireless Sensors and a Water Balance Model in Clay Loam Soil

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Abstract

This study investigated the effectiveness of drip irrigation systems controlled by wireless sensors and a water balance model on the growth, yield, and water use efficiency (WUE) of cassava cultivated in clay loam soil. Four irrigation treatments were assessed: rainfed (T1), drip irrigation managed by a water balance model (T2), drip irrigation regulated by one sensor set per 1.2 ha (T3), and by three sensor sets per 1.2 ha (T4). Precision drip irrigation significantly enhanced cassava growth, nutrient uptake, biomass accumulation, and tuber yield compared to rainfed conditions. Sensor-based irrigation (T3 and T4) achieved superior WUE by reducing water input without compromising yield. Notably, T3 and T4 used approximately 369 m^3/ha less irrigation water than the timer-based treatment (T2). Increasing sensor density beyond one set/plot provided no additional agronomic advantage, highlighting the importance of cost-effective deployment. These findings highlight the potential of precision irrigation technologies to enhance cassava production and resource efficiency in regions characterized by irregular rainfall patterns.

Keywords: Manihot Esculenta, Drip Irrigation, Soil Moisture Sensor, Water Balance Model, Water Use Efficiency

Biogenic Amine Formation and Microbiological Profile in Asian Seabass and Short-Bodied Mackerel During Refrigerated Storage

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Abstract

Biogenic amines (BAs) are key chemical indicators of fish spoilage and potential food safety hazards. This study investigated the formation of four common BAs-histamine, cadaverine, putrescine, and tyramine-and monitored microbial populations in Asian seabass (*Lates calcarifer*) and short-bodied mackerel (*Rastrelliger brachysoma*) stored at 0°C and 4°C for seven days. Total viable counts, staphylococci, and Enterobacteriaceae were assessed using culture-based methods, while BA concentrations were quantified by high-performance liquid chromatography (HPLC). The results revealed that microbial growth and BA accumulation were significantly higher in fish stored at 4°C, with short-bodied mackerel showing a markedly greater susceptibility to spoilage. Histamine levels in short-bodied mackerel at 4°C reached 292.67 ± 1.53 mg/kg by day seven. In contrast, histamine remained undetectable in Asian seabass under the same conditions. These findings provide essential baseline data for spoilage assessment in Thai seafood products and highlight the importance of species-specific storage guidelines and strict temperature control to ensure food safety.

Keywords: Biogenic Amines, Fish Spoilage, Refrigerated Storage, Asian Seabass, Short-bodied Mackerel

Effects of *Dictyophora indusiata* powder and purple rice flour on the baking quality characteristics and volatile flavor of cookies

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Abstract

This study investigated the effects of incorporating *Dictyophora indusiata* powder and purple rice flour on the baking quality, nutritional composition, antioxidant properties, and flavor profile of cookies. A gradient substitution model was employed, replacing wheat flour with varying proportions of *Dictyophora indusiata* (0–5%) and purple rice flour (0–20%). The results demonstrated that the combination of these ingredients significantly enhanced the dietary fiber content (up to 3.25 g/100 g) and protein levels in the cookies, while also improving antioxidant activity, as evidenced by increased DPPH (2,2-Diphenyl-1-picrylhydrazyl) and ABTS (2,2'-Azino-bis (3-ethylbenzothiazoline-6-sulfonic acid)) radical scavenging rates (up to 75.8% and 72.2%, respectively). Additionally, the *in vitro* digestibility analysis revealed a reduction in starch hydrolysis and GI (glycemic index), attributed to the synergistic effects of resistant starch and fiber. However, sensory evaluation indicated that higher substitution levels led to darker coloration and altered texture, impacting overall acceptability. The study highlights the potential of *Dictyophora indusiata* and purple rice as functional ingredients for developing nutritious, low-glycemic-index baked goods, provided that substitution ratios are optimized to balance health benefits with sensory quality.

Keywords: Dictyophora Indusiata Powder; Purple Rice Flour; Cookies Quality; Antioxidant Activity; Volatile Flavor

Natural Colorant from *Chara corallina* and Application in Ma Muang Bao Gummy Jelly

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Abstract

This experiment investigated the application of natural colorant, which was stabilized chlorophyll from *Chara corallina*. Ma Muang Bao gummy jelly product was used for this application. The result showed that the basic recipe for Ma Muang Bao gummy jelly production consisted of 20 grams of mango, 20 grams of water, 10 grams of gelatin, 10 grams of glucose syrup, 39.2 grams of sugar and 0.8 grams of citric acid. Muang Bao gummy jelly supplemented with 0.5% colorant powder from *Chara coralline* was suitable. The obtained products had a preference score for each characteristic in the range of 7.94-8.46 (like moderately to like very much). For the analysis of physicochemical quality of Ma Muang Bao gummy jelly supplemented with colorant powder from *Chara corallina*, it was found that moisture, ash, protein, fat, fiber, carbohydrate and energy contents were 41.74%, 2.35%, 11.98%, 0.025%, 0.054%, 43.90% and 223.74%, respectively. The total acid content was 0.14% and the water activity (a_w) was 0.64. While the lightness (L*), greenness (-a*) and yellowness (b*) were 46.14, -0.82 and 22.71, respectively. Microbiological quality showed total viable counts less than 25 CFU/g, while yeast and mold counts were less than 10 CFU/g. Additionally, it can be concluded that the natural colorant (stabilized chlorophyll) from *Chara corallina* has the potential for application in food products.

Keywords: Natural Colorant, Chara Corallina, Gummy Jelly, Ma Muang Bao

Postharvest Preservation of Trimmed Coconuts: Evaluating Citric Acid, Sodium Chloride, and Peroxyacetic Acid Treatments

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Abstract

The shelf life of trimmed coconuts can be extended through chemical treatments, such as the application of acids or chlorine-based compounds, which are commonly used to inhibit browning and microbial growth. However, the use of these substances is often restricted in fresh food applications due to regulatory limitations and consumer safety concerns. This study aimed to monitor the effects of pretreating trimmed coconuts with citric acid (CA), sodium chloride (NaCl), and peroxyacetic acid (PAA) solutions on their quality during 15 days of chilled storage. Trimmed coconuts were immersed for 5 minutes in solutions of CA at concentrations of 10% and 20%, NaCl at 10% and 20%, and PAA at 80 ppm before packaging. The treated samples were then compared to a control group that received no treatment. Throughout a 15-day storage period at 5°C, the treated coconuts were evaluated for visual quality, color values (L, a, b), total plate count, and yeast and mold count on their surfaces. Additionally, the chemical quality of the coconut water was assessed by measuring titratable acidity, pH, and total dissolved solids. The results indicated that coconuts treated with 20% CA and 20% NaCl solutions were most effective in preserving visual quality and color, and in controlling microbial growth ($P<.05$). In contrast, coconuts soaked in PAA solution showed a reduction in bacterial count only for up to 6 days and exhibited yellowing immediately after treatment. Consequently, 20% CA and 20% NaCl solutions appear to be promising chemical treatments for controlling post-harvest deterioration of trimmed coconuts.

Keywords: Trimmed Coconut, Shelf–life Extension, Citric Acid, Sodium Chloride, Peroxyacetic Acid

Effects of Protein- and Carbohydrate-Based Foaming Agents on Foam Stability and Microstructure in Freeze-Dried Coffee

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Abstract

The development of high-quality instant coffee products is essential for increasing market accessibility and economic value for local coffee producers. This study investigates the impact of various foaming agents—maltodextrin, whey protein isolate, and egg white powder—on the foam stability and microstructure of coffee extracts processed via foam-mat freeze drying. Coffee extract prepared from roasted Arabica beans sourced from Plang Yai community in Chiang Mai, Thailand, was combined with ten different formulations of foaming agents and evaluated through foam stability testing and scanning electron microscopy (SEM). Results showed that egg white powder was the most effective foaming agent, yielding stable foams and uniform pore structures, particularly when used in concentrations above 5%. While maltodextrin and whey isolate alone did not produce stable foams, they enhanced structural stability when used in combination with egg white powder. SEM imaging further confirmed that the optimal formulations exhibited well-developed porous networks, crucial for drying efficiency and product rehydration. The highest foam stability (96.1%) was achieved with a balanced formulation of all three agents. These findings confirm the synergistic interaction between proteins and carbohydrates in foam stabilization, offering a robust method for producing premium instant coffee. The integration of this approach enables smallholder enterprises to expand product lines while maintaining quality, enhancing the economic sustainability of coffee farming communities.

Keywords: Foam-mat Drying, Freeze-dried Coffee, Foaming Agents, Foam Stability, Coffee Microstructure

Comparative Evaluation of Antioxidant Potential and Basic Chemical Properties of Thai Honeys from Four Floral Sources

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Abstract

This study aimed to investigate the antioxidant activities and chemical compositions of honeys derived from four floral sources: coffee, lychee, longan, and Siam weed. Honey samples were collected from commercial honey producers in Chiangmai Thailand. The antioxidant activities were evaluated using FRAP and DPPH assays, while total phenolic content and chemical compositions, including total soluble solids (°Brix), total acidity, and pH, were also analyzed. The results showed that coffee flower honey exhibited the highest antioxidant capacity, with FRAP and DPPH inhibition values of 662.23±0.42 μmol Fe^{2+}/100 g and 39.53±0.76%, respectively, along with a total phenolic content of 507.31±1.69 mg GAE/kg. Lychee and longan honeys demonstrated similar moderate levels of antioxidant activity, whereas Siam weed honey showed the lowest values across all antioxidant parameters. In terms of chemical composition, coffee flower honey had the highest °Brix value (80.70±0.26°Brix), while lychee honey exhibited the highest total acidity (21.25±1.02 mEq/kg) and the lowest pH (3.40±0.05). Siam weed honey presented the lowest total soluble solids and total phenolic content values, corresponding with its weak antioxidant properties. These findings indicate that coffee flower honey has the highest potential as a biologically valuable ingredient suitable for development into natural health supplements or beauty products. Lychee and longan honeys also demonstrated promising chemical and biological properties. This study provides essential baseline data for selecting high-value Thai honeys and for adding commercial value through product innovation.

Keywords: Honey, Floral Honey, Antioxidant Activity, Phenolic Compounds, Chemical Composition

Enhancing Protein and Functional Properties of Gluten-Free Black Rice Flour and Tapioca Starch Pasta Fortified with Chicken Meat

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Abstract

This study investigated the effect of chicken meat fortification on the color, cooking quality, antioxidant properties, texture, proximate composition, and sensory characteristics of gluten-free pasta made with black glutinous rice flour and tapioca starch. Chicken meat incorporation significantly influenced the color values (L*, a*, and b*), with higher chicken meat content resulting in darker and more intense color due to the anthocyanins in black glutinous rice ($p<.05$). As chicken meat content increased, pasta exhibited longer cooking times, higher water absorption, and decreased cooking loss and volume expansion, indicating slower starch swelling and gelatinization ($p<.05$). Antioxidant activity, total phenolic compounds, and anthocyanin content were higher in chicken-fortified pasta compared to the control, but decreased as the chicken meat content increased. Textural analysis revealed that pasta containing higher levels of chicken meat exhibited reduced hardness, cohesiveness, springiness, gumminess, and chewiness. Proximate composition showed significant increases in protein, fat, and ash content, while crude fiber decreased with higher meat incorporation ($p<.05$). Sensory evaluation demonstrated that pasta with 20% chicken meat was the most acceptable in terms of appearance, odor, and taste. Overall, the study indicates that fortifying gluten-free pasta with chicken meat enhances nutritional properties but may affect sensory attributes, with 20% chicken meat being the most preferred variation.

Keywords: Gluten-free Pasta, Chicken Meat, Glutinous Black Rice Flour, Tapioca Starch

Characterization of a Commercial β-Mannanase: Activity and Molecular Weight Determination

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Abstract

β-Mannanase (endo-1,4-β-D-mannanase) is a glycoside hydrolase belonging to the GH5 family, with potential applications in producing manno-oligosaccharides (MOS), recognized for their prebiotic properties. This study aimed to characterize the activity and estimate the molecular weight of a commercially available β-mannanase (EC 3.2.1.78), Mannanase BGM "AMANO" 10. The enzyme activity was assayed using 2 mg mL^{-1} konjac glucomannan (KGM) in a 0.1 mL reaction mixture incubated at pH 5.0 and 70°C for 30 min. Reducing sugars were quantified by the 3,5-dinitrosalicylic acid (DNS) method (Miller, 1959), with mannose as standard ($y = 0.3012x + 0.0103$, $R^2 > 0.99$), and expressed as mannose equivalents (MW = 180.16 g mol^{-1}). One unit (U) was defined as the release of 1 µmol reducing sugar per minute, and 0.0003 mg of protein was used. The specific activity was approximately 96,790 U/g protein. SDS-PAGE revealed a molecular weight between 50–75 kDa. These findings support the enzyme's high catalytic efficiency, substrate specificity, and thermostability under acidic conditions, highlighting its potential for biotechnological applications in MOS production and functional food development.

Keywords: β-Mannanase, Enzymatic Activity, Specific Activity, Molecular Weight

Innovative Dietary Supplement Product to from Baby Melon Extract from the Melon Farm in Chiang Mai Province

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Abstract

Japanese melon (ML) from Rai Weyasri Co., Ltd. studying the biological activity of all 3 strains of melon extract and isolated by various methods. The pulp was extracted by maceration at 95% ethanol (E) and extraction by boiling in distilled water (H). A total of 11 samples were found to produce between 1.37 and 42.3% and contain terpenoids as the main component in the extract. Then, the biological activities of different pathogens were studied, including antioxidant activity, anti-aging, and toxicity to human hepatocytes. and renal cells, which found that ethanol extract from Kanemitsu melon leaves (L-MLKC-E) has an inhibitory effect on the peroxidation of fats and metal chelation the best, while the aqueous extract from melon pot-orange (R-MLPO-H) had the best DPPH antioxidant activity Ethanol extract from melon pot-orange (R-MLPO-E) has the best effect on activating the expression of aging-related genes (FoxO1 and Sirt1) inhuman skin cells. All extracts showed no toxicity to human hepatocytes or renal cells at a 0.1 mg/ml concentration. Therefore, it was selected to test for acute oral toxicity. No signs of toxicity were shown in the experimental animals. As a result, ethanol extract from orange melon was classified in the GHS category.5. Acute oral toxicity was not found. This shows that the extract is very safe. Then developed into dietary supplements in the form of soft capsules. that can be further commercialized in the medical industry

Keywords: Baby Melon Extract, Dietary Supplement, Functional Food, Innovative Product Development, Melon Farm

Role of Calcium Silicate for Growth Enhancement and Possibility to Alternaria Leaf Spot Control in Chinese Cabbage

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Abstract

Calcium silicate is an inorganic compound that plays a crucial role in strengthening plant cell walls, enhancing resistance to environmental stresses and pathogenic infections. It has also been reported to stimulate plant growth and induce defense mechanisms through physiological and biochemical pathways. This study aimed to evaluate the efficacy of calcium silicate in promoting seed germination, enhancing seedling physiological development, and possibility inhibiting the growth of the fungal pathogen responsible for leaf spot disease in Chinese cabbage (*Brassica rapa* subsp. *chinensis*). The fungus pathogen was isolated from diseased Chinese cabbage collected in Phra Nakhon Si Ayutthaya Province, Thailand. Based on morphological identification and molecular techniques using PCR amplification of the ITS1-5.8S-ITS2 region were identified the pathogen as *Alternaria brassicicola*, with identity level of 98.00–100.00%. The effect of calcium silicate on seed germination at three different concentrations (1%, 2%, and 3%) were investigated. The finding indicated that calcium silicate had no effect on seed germination within the first 72 hours, with all treatments showing a 100% germination rate. However, seedling development was significantly influenced by the treatment. The 3% of calcium silicate yielded the highest performance, with seedlings at 28 days exhibiting an average height of 15.80 cm, an average of 7 roots per plant, and a mean root length of 5.43 cm with significantly greater than the control. For the possibility to fungal control using the poisoned food technique, calcium silicate at the highest concentration was able to inhibit *A. brassicicola* mycelial growth by 28.21%. Based on these findings, calcium silicate demonstrates potential as a growth-promoting agent for Chinese cabbage, particularly in enhancing root system development, while also providing partial suppression of fungal pathogens. Hence, calcium silicate could be considered as an effective seed coating or soil amendment to protect seeds during early germination and seedling establishment.

Keywords: Calcium Silicate, Chinese Cabbage, Fungal Pathogen, Seed Development

Effect of Pre-Cooling on Antioxidant activity and shelf life of Fresh water convolvulus sprouts

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Abstract

The sprouting stage of this plant, referred to as fresh water convolvulus sprouts, is increasingly recognized not only for its culinary value but also for its potential health benefits. One of the most notable bioactivities associated with these sprouts is their antioxidant activity, which plays a crucial role in preventing oxidative stress-related diseases. This research aimed to investigate the shelf life and antioxidant activity of fresh water convolvulus sprouts. Study on pre-cooling was conducted by using water convolvulus sprouts at a temperature of 5±1 ºC and compared with 0, 5, 10 and 15 min. Vegetable was stored at a temperature of 14 ± 2 ºC, 80 - 85 % relative humidity. It was found that treated water convolvulus sprouts reduced polyphenols, flavonoids ascorbic acid (vitamin C), β-carotene, tannins and chlorophylls was found to be than non pre-cooled vegetable, as a result the shelf life of water convolvulus sprouts was extended. Non-precooled and pre-cooled water convolvulus sprouts had shelf life of 5.2 ± 0.18 and 9.3 ± 0.04 days, respectively.

Keywords: Water Convolvulus Sprouts, Pre-cooling, Shelf Life, Antioxidant Activity

Efficacy of Probiotic Yeasts in Controlling Vibrio parahaemolyticus and Vibrio harveyi in Whiteleg Shrimp (Litopenaeus Vannamei)

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Abstract

Vibrio parahaemolyticus and *V. harveyi*, are the causative agent of disease are causative agents of disease in shrimp aquaculture. In this work, we isolated yeasts from intestine of wild shrimp possessing inhibitory activity against *V. parahaemolyticus* and *V. harveyi*. Sixteen of 48 yeast isolates inhibited *V. parahaemolyticus* and *V. harveyi*. YP8, YP12, YP15, YP16, YP18, YP20, YP24, YP26, YP30 and YP32 were ten yeast isolates with high inhibitory activity with inhibition zones ranging from 9.00 ± 0.07 to 21.80 ± 0.14 mm. The toxicity test of nine yeast isolates (excluding YP32) revealed no harmful effects on whiteleg shrimp (*Litopenaeus vannamei*) after 120 h. In addition, five isolates (YP26, YP24, YP20, Y18 and Y8) showed high survival rates in the shrimp intestine. Polymerase chain reaction targeting the internal transcribed spacer region was used to identify yeast species, which was validated by sequencing. *Saccharomyces cerevisiae*, *Candida tropicalis*, *Wickerhamomyces anomalus*, *Yarrowia lipolytica* and *Candida glabrata* were shown to have 99-100 % identity to GenBank sequences. These findings indicate that *Y. lipolytica*, *S. cerevisiae* and *W. anomalus* are suitable for use as probiotics to control *V. parahaemolyticus* and *V. harveyi* in shrimp aquaculture due to their strong inhibitory activity, safety to shrimp, and ability to survive in the shrimp intestine.

Keywords: Yeast, Inhibitory Activity, Vibrio Parahaemolyticus, Vibrio Harveyi, Whiteleg Shrimp

SESSION 3

Science and Engineering Technology

The Cytotoxicity and Alkaline Phosphatase Activity of Water-Soluble Extract from the Abalone Nacre on the Preosteoblast

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Abstract

Nacre, a calcium carbonate-based biomaterial, has traditional pharmaceutical applications in bone regeneration. This study explored the osteoinductive potential of nacre from abalone Haliotis diversicolor, specifically its water-soluble extract (HD-WSM), on MC3T3-E1 mouse osteoblasts. HD-WSM was extracted and tested for cytotoxicity using the AlamarBlue Assay. Results indicated HD-WSM was non-cytotoxic within a 50-250 µg/ml concentration range, with cell viability remaining consistent with controls after 48 hours. A slight increase in cell proliferation was observed at 150-250 µg/ml after six days, leading to the selection of 100 and 200 µg/ml for further analysis. Alkaline phosphatase (ALP) activity, a marker of osteoblast differentiation, was measured using an ALP Assay Kit. HD-WSM significantly enhanced ALP activity in a dose-dependent manner across 50-250 µg/ml concentrations, starting from day three. The untreated cells also showed increasing ALP levels, reflecting natural osteoblast proliferation. The results demonstrate that HD-WSM promotes both cell proliferation and ALP activity in MC3T3-E1 cells, suggesting its potential as an osteoinductive material.

Keywords: Cytotoxicity, Alkaline Phosphatase, Nacre, Preosteoblast

Sitting Posture Detection and Prevention of Office Syndrome Using MediaPipe Technology

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Abstract

With the increasing prevalence of office syndrome caused by prolonged sitting and poor posture, this paper proposes a real-time posture detection system aimed at improving ergonomic practices in the workplace. The system leverages the MediaPipe Framework, an advanced deep learning-based tool for human pose estimation, to monitor and assess upper body posture. This study aims to assess the accuracy and responsiveness of a MediaPipe-based system in detecting incorrect sitting postures associated with office syndrome. The proposed system continuously tracks posture throughout work hours, thereby reducing the likelihood of developing musculoskeletal pain. The research process began with the development of a posture detection algorithm that utilized MediaPipe's pose estimation model to calculate angular deviations based on landmarks for the shoulder and head. This was followed by the implementation of the system, real-time testing, and performance evaluation under simulated office conditions. Through an experiment with 10 volunteers, selected to represent a manageable and diverse group for initial validation. The system's accuracy was evaluated by comparing the calculated angles with the actual angles in three key positions: neutral, left-side tilt, and right-side tilt. The results showed that the system performed with high accuracy in the neutral position, with a Mean Absolute Error (MAE) close to 0%, but had a higher MAE of approximately 20% in the tilted positions. The system demonstrated an average processing time of 0.20 seconds per frame, which corresponds to approximately 5 frames per second, indicating its potential for real-time posture monitoring. This study contributes to the development of efficient workplace health technologies that promote better posture and reduce the risk of office syndrome.

Keywords: Posture Detection, Human Pose Estimation, MediaPipe Framework, Office Syndrome

Real-Time pH Monitoring and Automated Control System for Sustainable Aquaculture

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Abstract

Fluctuations in pH levels can have a detrimental impact on the health, productivity, and ecosystem balance of aquatic organisms. Maintaining a stable pH within the optimal range is essential to ensure water quality and fish well-being. This study presents the design and validation of a real-time automated pH monitoring and control system to support sustainable aquaculture practices by regulating water pH using 0.2% (W/V) vinegar solution and 5% (W/V) dolomite solution. The system features real-time pH monitoring via a pH sensor and utilizes the ESP32 microcontroller to automate pH adjustments, with data logged to Google Sheets for remote tracking. The research process was conducted in two phases: The first phase involved determining the appropriate quantities of each solution for safe and effective pH regulation through incremental dosage trials, ensuring that the pH change did not exceed 2 units per day. The second phase evaluated the system's performance in actual control scenarios by adjusting the pH in a 1500 ml water container from acidic and basic conditions toward neutral, and by measuring the required time and solution saturation dynamics. The results show that the system can efficiently adjust the pH from acidic to neutral or from basic to neutral, with the required application of 4 ml of dolomite solution and 2 ml of vinegar solution per cycle. The time required for pH adjustment was approximately 1 day for changing pH from 4 to 7 and 1.5 days for adjusting pH from 8.5 to 7. These findings validate the effectiveness of the proposed system in controlling pH levels in aquaculture and demonstrate its potential for large-scale applications in water quality management.

Keywords: pH Control System, Aquaculture, Real-Time Monitoring, IoT-based Monitoring, Vinegar Solution, Dolomite Solution

IoT-Based Remote Monitoring and Alert System for Bedridden Patient Care in Thailand

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Abstract

An increasing aging population in Thailand has placed a growing burden on healthcare resources. By 2030, the number of bedridden elderlies is expected to reach 153,000, nearly three times the current figure. To address this, we have developed an IoT-based remote monitoring and alert system designed to assist caregivers in patient management. This system integrates smart sensors and cloud connectivity to provide real-time monitoring and alerts. A mobile application prototype, built using Google Sheets and AppSheet, offers real-time data visualization and allows caregivers and doctors to remotely track patient conditions. The app provides two access levels: caregivers or doctors can monitor multiple patients, while patients can view their own records. Instant alerts notify caregivers of critical changes ensuring timely intervention. Two IoT medical devices are implemented within this framework. The first device is an automatic hospital bed equipped with an inertial measurement unit and radar sensors to track patient activities, and head of bed elevation. The second device is a blood pressure and heart rate monitoring device that measures vital signs in intervals. Enabling IoT functionality increases the power consumption of both tested devices compared to their non-IoT versions. This power increase is observed in idle states and is also evident during active operational modes of the second device due to the demands of active components.

Keywords: IoT-based Healthcare Integration, Caregiver Alert System, Real-time Health Monitoring

Herbal Sheet-Free Peel-off Facial Mask Development from Cissampelos spp. Leaf Powder

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Abstract

This study aimed to determine the optimal formulation ratio of an herbal facial mask powder derived from *Cissampelos* spp. leaves, eliminating the necessity for a sheet mask. The formulation incorporated turmeric (*Curcuma longa*), mulberry twigs (*Morus alba*), and silk cocoon extracts as active ingredients, with an additional objective of evaluating the cosmeceutical properties of the mask. The findings indicated that the most suitable ratio for mask formation was 1:15 (powder to water). Antioxidant activity was assessed using the ABTS and FRAP assays. Turmeric extract at concentrations of 50 and 100 mg/mL exhibited the highest antioxidant capacity, yielding values of 2,733.79 ± 10.97 and 2,764.09 ± 16.97 Trolox mM eq./g extract for ABTS, while FRAP activity was recorded at 331.65 ± 0.02 and 386.50 ± 0.01 Trolox mM eq./g extract, respectively. Regarding tyrosinase inhibition, crude mulberry twig extract at 25 mg/mL demonstrated the highest inhibitory effect, with 51.96 ± 0.01% inhibition. A comparative evaluation of four mask formulations, based on moisture content analysis, revealed that the F4 (control) exhibited the highest moisture percentage at 26.67 ± 0.05%. Additionally, the F1 (turmeric extract) demonstrated the strongest antioxidant properties, yielding ABTS and FRAP values of 4,777.12 ± 0.03 and 3,633.75 ± 0.22 Trolox mM eq./g extract, respectively. Conversely, the F2 (mulberry twig extract) exhibited the highest tyrosinase inhibition at 58.87 ± 0.45% inhibition. Sensory evaluation of cosmeceutical attributes indicated no significant differences among the herbal mask formulations. Clinical testing further revealed that the F1 (turmeric extract) effectively reduced the number of fine lines by 11.00 ± 0.20 lines.

Keywords: Cissampelos spp, Facial Mask, Gelling agent, Pectin

Enhancement of Allura Red Removal by Using Semi-IPN Hydrogels Based on Natural Rubber and Poly (Ethylene Glycol) Methyl Ether Methacrylate

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Abstract

This work presents the design and assessment of an elastomeric hydrogel based on a semi-interpenetrating polymer network (semi-IPN), formed from natural rubber (NR) and poly (ethylene glycol) methyl ether methacrylate (PEGMA), aimed at the removal of Allura red (AR) dye from aqueous environments. A range of PEGMA-to-NR ratios was explored to understand the effect of composition on material behavior. Surface morphology, examined through SEM, indicated a homogeneously porous structure with interconnected pores of varied sizes. FTIR spectra provided evidence for the formation of the semi-IPN system, showing functional groups characteristic of both NR and PEGMA components. Adsorption efficiency studies revealed that the hydrogel could effectively capture AR dye, with a maximum adsorption capacity of 223 mg/g observed at a PEGMA/NR ratio of 90:10. Furthermore, UV–visible spectroscopy confirmed the substantial decrease in AR concentration after interaction with the hydrogel. These results support the application of PEGMA/NR semi-IPN hydrogels—owing to their ionic interaction capabilities—as promising candidates for dye removal in wastewater treatment processes, especially within industrial effluent management.

Keywords: Elastomer, Hydrogel, Natural Rubber, Poly (Ethylene Glycol) Methyl Ether Methacrylate, Allura Red

Analysis of the Advancement Technologies and Development Trends of Photovoltaic Module

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Abstract

Photovoltaic (PV) systems are continually growing and increasingly recognised as one of the crucial keys to clean and resilient energy infrastructures. Therefore, the technology of PV has undergone significant advancements that aim to improve energy conversion efficiency, reduce production costs, and develop system integration into residential and industrial areas. This research provides a comprehensive analysis of the evolution of solar cell technologies from traditional conventional, such as silicon-based cells, to emerging innovations, such as perovskite. The research also explores future trends, including developing highly flexible modules capable of operating under low-light conditions and integrating with modern technologies such as the Internet of Things (IoT) and advanced electric vehicle charging station systems. In addition to practical applications, mathematical models play essential parts in this research and analysis, where they are used to evaluate new materials, cell architectures, and emerging technologies. The typical mathematical modelling approaches include the single-diode and double-diode models, which offer varying degrees of accuracy and complexity, as well as empirical models derived from experimental data, as these models are indispensable tools for understanding, predicting, and optimising the electrical behaviour of PV devices under varying environmental and operational conditions. This paper explains the critical role of mathematical modelling in designing, analysing, and evaluating PV systems before physical deployment to minimise financial risk and accelerate innovation in PV technology.

Keywords: Photovoltaic (PV) Systems, Mathematical Modelling, Solar Cell Technologies, Technological Innovation

Uncovering the Role of Fe in Geopolymers via Synchrotron XANES and EXAFS: Insights from Fly Ash, Bagasse Ash, and Calcium Carbide Residue Systems

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Abstract

Geopolymers made from industrial waste like fly ash (FA), bagasse ash (BA), and calcium carbide residue (CR) are being explored as sustainable alternatives to Portland cement. This study focuses on how adding 5 wt% of iron oxide (Fe_2O_3) affects the internal structure of these geopolymers. We used advanced synchrotron techniques—X-ray absorption near-edge structure (XANES) and extended X-ray absorption fine structure (EXAFS)—to understand how iron behaves inside the material. All samples with added iron showed an absorption edge around 7120 eV, confirming that iron mainly exists in the +3 oxidation state (Fe^{3+}). It can be noticed that the way iron atoms were arranged depended on the type of raw materials. In samples with high fly ash, iron seemed to bond more neatly inside the structure. In contrast, samples with more calcium carbide residue had more disorder and signs of separate iron oxide phases. These changes were supported by XRD and compressive strength results, which showed that better iron incorporation led to better structure and performance. Our findings suggest that the raw material composition strongly affects how iron fits into the geopolymer and influences the material's strength. This study highlights the value of synchrotron techniques in designing better geopolymers and deepens our understanding of how iron interacts in different systems.

Keywords: Geopolymer, Iron Incorporation, XANES, EXAFS

Influence of Pozzolanic Materials in Ternary Blend Systems on Strength and Chloride Resistance of Concrete

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Abstract

Pozzolanic materials (fly ash, meta kaolin, and silica powder) were investigated to partially replace cement based on their impact on the strength and chloride resistance of the concrete. The compressive strength was investigated in the range 240–350 kg/cm^2 with a water-to-binder ratio (w/b) of 0.40 for the best performance, while varying the amount of cement replaced by ternary blended systems using cement with the main quantities by weight of cement being fly ash (65%), kaolin (10–15%), and silica powder (2.5 or 5%) compared to the controlled sample and cementitious mixtures. The concrete mix included high volume water-reducing agent (superplasticizer Type F) of a special water-reducing type. Along with tests of the mechanical properties of compressive strength, splitting tensile strength, flexural strength, and also chloride ion movement test electrolysis using the chloride migration test. The test results showed that the ternary blended systems of the concrete containing the pozzolanic materials at w/b equal to 0.40 had the best mechanical properties. The concrete mixture with replacement of cement with fly ash and metakaolin with alumina oxide had a greater effect on compressive strength than adding silica. The tensile strength and flexural strength were better in the mixture of fly ash and silica powder, as was the electrophoretic movement of chloride ions in the concrete, with better binding of chlorine. However, the physical properties of the metakaolin and silica powder, such as their particle distribution and high specific surface area, resulted in a more rapid pozzolanic reaction that increased the CSH and CAH, and increased the opacity of the concrete, resulting in overall improved mechanical properties of the concrete.

Keywords: Pozzolans, Compressive Strength, Flexural Strength, splitting Tensile Strength, Chloride Migration

Gamma Shielding Efficiency of Sedimentary Rock-Based Bricks for Low-Energy Applications

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Abstract

Ensuring human safety requires understanding the radiation shielding capabilities of building materials alongside their strength and durability. This study investigates the potential of concrete made from two types of sedimentary rocks, shale and calcareous, for shielding against Co-60 gamma rays at energy levels of 960 keV and 1180 keV. The sedimentary rocks were sourced from the Global Geopark region in Satun Province, Thailand. The shielding performance of sedimentary rock-based concrete is compared with standard construction concrete, with both having identical dimensions of 15 cm × 15 cm × 15 cm and a cement-to-sand-to-stone ratio of 1:2:4. Engineering properties such as density and compressive strength are analyzed. Gamma shielding efficiency is assessed using the linear attenuation coefficient (μ_l), mass attenuation coefficient (μ_m), mean free path (MFP), half-value layer (HVL), and tenth-value layer (TVL). The results indicate that standard concrete exhibits the highest compressive strength, while shale-based concrete provides superior attenuation of gamma rays at the studied energy levels. The effectiveness of gamma radiation shielding in construction materials is influenced by the internal composition of the stone or concrete mixture.

Keywords: Gamma Radiation Shielding, Sedimentary Rocks, Concrete Against Radiation

Electrochemical Behavior and Characterization of Nanochitosan-2, 4-dihydroxybenzaldehyde as a Sensor for the determination of Copper (II) ion

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Abstract

Chitosan nanoparticle-2,4-dihydroxybenzaldehyde was synthesized via the reaction between the 2-amino groups of nanochitosan and 2,4-dihydroxybenzaldehyde, yielding 75%. Chemically modified rotating gold disk electrodes incorporating chitosan nanoparticle-2,4-dihydroxybenzaldehyde were prepared and employed as sensors for the detection of copper (II) ions. The electrochemical characterization of copper (II) at the modified electrodes was investigated using cyclic voltammetry. Optimal performance was achieved with a paste composition of 74% (w/w) graphite powder, 5% (w/w) chitosan, and 21% (w/w) paraffin oil in a 0.2 M sodium acetate solution at pH 7, using a scan rate of 0.8 V/s, a deposition time of 40 s, and an equilibration time of 25 s. A linear response was observed in the range of 1 to 10 mg/L, with a correlation coefficient of 0.98 and a detection limit of 0.176 mg/L.

Keywords: Copper, Sensor, Nanochitosan, Modified Electrode

Enhancement of Electrical Energy Generation using Banana-Based Electrolytes for Science Education

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Abstract

Renewable energy represents a viable alternative in response to the global decline in fossil fuel resources. Batteries function by storing chemical energy and converting it into electrical energy through electrochemical reactions. In this study, a microbial fuel cell kit was designed and developed as an educational tool aligned with STEAM-based learning for upper secondary school students. Banana pseudostem sap (BPS) was investigated as a potential natural electrolyte for constructing a simple biobattery using zinc and copper electrodes. The primary objective of the experiment was to enhance electrical output by optimizing the fermentation time of the BPS electrolyte. The acidity of the fermented electrolyte, indicated by pH levels, was found to play a critical role in electrical performance. Experimental results demonstrated that a seven-day fermentation period produced the highest output, with a maximum voltage of 0.99 V, electric current of 2.74 mA, and power output of 2.71 mW, corresponding to the lowest pH value of approximately 4.86. These findings suggest that banana-based biobatteries can generate measurable electrical energy, offering a cost-effective and environmentally sustainable approach to green energy storage, particularly in educational and low-resource settings.

Keywords: STEAM Learning, Electrical Energy, Banana Pseudostem Sap (BPS), Electrochemical and Renewable Energy

Innovative Facial Serum Products from Ulva Rigida Extract

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Abstract

This study aimed to investigate the phytochemical profiles and biological activities of three types of sea lettuce (Ulva lactuca) extracts obtained through juice extraction (SL-J), ethanol shaking extraction (SL-E), and hot water extraction (SL-H). Phytochemical analysis revealed that all extracts predominantly contained alkaloids and flavonoids. Quantitative analysis using HPLC demonstrated that SL-J contained the highest level of catechin (10,238.20 µg/g), while SL-E showed the presence of rutin, catechin, and quercetin at substantial concentrations. Cytotoxicity testing on human skin cells using the MTT assay showed that all extracts were non-toxic at concentrations up to 1 mg/mL. Antioxidant activities were evaluated through DPPH radical scavenging, lipid peroxidation inhibition, and metal chelation assays. The SL-E extract exhibited the highest DPPH scavenging activity (SC_{50} = 0.11 ± 0.01 mg/mL), while SL-H showed the strongest lipid peroxidation inhibition (LC_{50} = 0.83 ± 0.02 mg/mL), and SL-J had the best metal chelating ability (MC_{50} = 0.21 ± 0.02 mg/mL). Moreover, SL-J demonstrated the most potent tyrosinase inhibitory activity (IC_{50} = 0.09 ± 0.01 mg/mL), comparable to kojic acid. In melanogenesis inhibition assays using B16F10 melanoma cells, SL-E significantly reduced melanin production by 5.98% at 0.01 mg/mL. Additionally, SL-E stimulated collagen biosynthesis in human fibroblasts by 38.43%, approximately three times higher than L-ascorbic acid. Gene expression analysis revealed that SL-E upregulated anti-aging related genes, including Sirt1, FoxO1, TERT, and Klotho, with effects comparable to resveratrol. Finally, stability testing of the prototype serum product showed that it maintained acceptable physical and chemical properties after thermal cycle testing, including consistent pH, viscosity, and phenolic content. These results suggest that ethanol extracts of sea lettuce waste (SL-E) possess strong antioxidant, anti-aging, skin-brightening, and collagen-boosting activities, making them promising candidates for cosmeceutical applications.

Keywords: Ulva Rigida, Bioactivities, Cosmetics, Toxicity

Probiotic-Driven Hair Care Using Combining Herbal Dyes with a Microbiome-Modulating Conditioner

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Abstract

Conventional chemical hair dyes frequently cause adverse effects, including hair damage and scalp irritation, driving consumer interest towards safer, natural alternatives. This study successfully developed an eco-friendly hair care system combining natural herbal dyes (*Clitoria ternatea*, *Curcuma longa*, *Lawsonia inermis*) with a restorative probiotic-enriched conditioner (*Zingiber officinale* prebiotic, *Lactobacillus* spp. probiotics) as a safer alternative to conventional chemical treatments, which often cause hair damage and scalp irritation. Optimized bleaching as the first step prepared and then hair dyeing with butterfly pea achieved the highest initial color intensity (72%), though colorfastness was limited. The ginger-based conditioner supported probiotic viability and improved hair softness and smoothness without observed toxicity. While the green hair care system was refrigerated, its stability was better promising than room temperature, though its long-term preservation (more than 3 months) requires further improvement.

Keywords: Eco-friendly Hair Probiotics, Herbal Hair Dye, Herbal Hair Conditioner Formulation, Scalp Health Improvement.

From Waste to Worth Eco-Friendly Antimicrobial Postbiotics from Fermented Garlic Peels as a New Frontier in Natural Fruit Preservation and Shelf-Life Extension

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Abstract

Postbiotics, bioactive compounds produced during microbial fermentation, offer promising health and food preservation benefits. This study presents a novel postbiotic product developed by fermenting Chinese garlic peel extracts with *Lactobacillus* probiotics, aiming to reduce postharvest spoilage in tomatoes. The fermented garlic peel kombucha solution demonstrated antimicrobial activity against common spoilage and pathogenic bacteria, including *Pseudomonas* sp. and *Escherichia coli*. Safety assessment showed low hemolytic activity at concentrations below 200 mg/mL, with no alteration in red blood cell morphology. Antioxidant properties were significantly enhanced compared to regular kombucha, with total phenolic content (TPC) reaching 90.55 ± 10.1 mg GAE/100 mL and total flavonoid content (TFC) at 55.97 ± 8.5 mg RE/100 mL. Application of the fermented solution via surface spraying effectively reduced tomato weight loss, delayed ripening by lowering titratable acidity (TA), and maintained quality by modulating total soluble solids (TSS). These results suggest that fermented garlic peel postbiotics represent an innovative, safe, and environmentally friendly approach for extending the shelf life of fruits, with potential for broader agricultural applications.

Keywords: Kombucha, Garlic Peel Extract, Shelf-life Extension, Antioxidant Activity, Eco-Friendly

SESSION 4

Architecture and Creative Works

Knowledge Set about Online Media, Gingerbread House Architecture to Promote Tourism

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Abstract

This research aims to study the architecture of Gingerbread houses, Case Study: Bangkok Metropolitan Region and prepare a knowledge set of the media of the architecture of the Gingerbread houses in order to promote tourism among young generation and Thai tourists. The research starts from 1) the collection of data obtained from related documents and research, 2) the surveys of actual locations, 3) the interviews and observations by using questionnaires as a tool for surveying data. The sample group includes 40 second-year students of the Faculty of Engineering and Architecture, Rajamangala University of Technology Suvarnabhumi Nonthaburi Campus and young Thai tourists aged 15-30 years, 4) the photography and video recording of the architecture of the Gingerbread houses, 5) the preparation of the knowledge set of online media of the Gingerbread houses, 6) the collection of data, 7) the analyses of data applying SPSS for qualitative analysis, and 8) the conclusion, discussion and suggestions. The Gingerbread houses in this study are as follows: 1) Gingerbread House Monk Cells, 2) Golden Teak Museum, Thewarat Kunchorn Temple, Bangkok Metropolis, 3) Ekanak Museum, Bangkok Metropolis, 4) Diamond Residence, Bowon Niwet Temple, Bangkok Metropolis, 5) Moon Residence, Bowon Niwet Temple, Bangkok Metropolis, and 6) Ruean Phra Thanesuan. The research result shows that the knowledge set of the architectural media of Gingerbread houses for promoting tourism has a link to the website. https://www.gingerbreadhouseonline.com. Links to YouTube: 1) Gingerbread Houses – Abbot Cell, Monk Cells and Panthawakarn School Building, Suan Phlu Temple, Bangkok Metropolisouses, https://youtu.be/R-_hP4c7RK4, 2) Gingerbread Houses – Moon Residence, Diamond Residence and Boonyarattawet Monk Cell, Bowon Niwet Temple, Bangkok Metropolis, https://youtu.be/T1OshjjB9gs, 3) Gingerbread Houses – Golden Teak Museum, Thewarat Kunchorn Temple, Bangkok Metropolis, https://youtu.be/rS01EcVfFMk, 4) Gingerbread Houses – Ekanak Museum, Bansomdejchaopraya Rajabhat University, https://youtu.be/Ua0BxT2ToJU, 5) Gingerbread Houses - Ruean Phra Thanesuan, Sanam Chan Palace, Nakhon Pathom Province, https://youtu.be/epircwkK_nw. Link to E-Book of Gingerbread Houses: 1) Knowledge Set of Gingerbread Houses, https://my.eboox.cc/JOT/L1/, 2) Abbot Cell, Monk Cells and Panthawakarn School Building, Suan Phlu Temple, Bangkok Metropolis, https://my.eboox.cc/JOT/L2/, 3) Chandra Residence, Diamond Residence and Boonyarattawet Monk Cell, Bowon Niwet Temple, Bangkok Metropolis, https://my.eboox.cc/JOT/L3/, 4) Ekanak Museum, Bansomdejchaopraya Rajabhat University, Bangkok Metropolis, https://my.eboox.cc/JOT/L4/, 5) Golden Teak Museum, Thewarat Kunchorn Temple, Bangkok Metropolis, https://my.eboox.cc/JOT/L5/, and 6) Ruean Phra Thanesuan, Sanam Chan Palace, Nakhon Pathom Province, https://my.eboox.cc/JOT/L6/. The Evaluation of E-Book and Knowledge Set of Gingerbread House Architecture Online Media for Promoting Tourism. For media, the overall quality is at a very good level, the mean of which equals 3.74. Upon considering each area, the qualities of all areas (image, sound, techniques and methods) have been found to be at a very good level. The area with the highest mean is the techniques and methods, equaling 3.93. The second area is the image with the mean of 3.71, and the mean of the sound is 3.56 respectively. When reckoning each area, the results are as follows: Image: The qualities of each area are at a very good level, the mean of which is 3.71. Upon considering the mean of each area, the highest mean has been found to be the interesting still image with the mean of 3.98, and the quality is at a very good level. The second area is the quality of the still image with the mean of 3.89, and the quality is at the very good level. The next area is the appropriateness of the illustration with the mean of 3.69, and the quality is at a very good level. The next area is the clarity of the meaning of the still image with the mean of 3.62, and the quality is at a very good level. In addition, the mean of the appropriateness of the still image is 3.38, and the quality is at a good level respectively. Sound: The overall quality is at a very good level with the mean of 3.56. Upon reckoning the mean of each area, the area with the highest mean has been found to be the clarity of the audio description with the mean of 3.78, and the quality is at a very good level. The second area is the appropriateness of the music with the means of 3.33, and the quality is at a good level respectively. Techniques and Methods: The qualities of the overall areas are at a very good level with the mean of 3.93. Upon considering the mean of each area, the qualities of all areas have been found to be at a very good level, and the highest mean is the creation of knowledge and direct experience with the mean of 3.93. The next area is the appropriateness of visual and audio sequences with the mean of 3.89 respectively. According to students' responses, more students are interested in visiting the Gingerbread houses. The students have seen the splendid and magnificence of the Gingerbread houses, as the Gingerbread houses are the heritage of Thailand.

Keywords: Knowledge Set, Online Media, Gingerbread House, Promote Tourism

SESSION 5

Business and Economics

The Inquiry of Knowledge, Skills, and Attitudes Toward Digital Technology for Travel Agency Employees in Bangkok, Thailand

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Abstract

This research aims to examine the knowledge, skills, and attitudes of travel agency employees toward digital technology, with the objective of proposing guidelines to enhance their digital technology capabilities. The research adopts a quantitative approach, gathering data through questionnaires from employees who regularly engage with digital technology. The collected data is analyzed using mean values and standard deviation. The research findings indicate that most of the sample group are male, aged between 20-30 years old, and work in itinerary planning department. Their knowledge, skills, and attitudes are as follows: 1) They possess a high level of understanding of digital technology and equipment maintenance. 2) The most prominent skill is the ability to use online maps, followed by communication skills via smartphones, information searching, equipment maintenance, and proficiency in using Microsoft Office, respectively. 3) The dominant attitude is the practical application of technology, followed by a passion for learning and self-development. Suggestions for developing employees' digital technology skills include enhancing knowledge of Excel formulas, computer equipment maintenance, Microsoft Office programs, applications usage, and peripheral devices operation. Additionally, fostering an attitude of staying updated with new developments and continuous training in digital technology skills is essential.

Keywords: Knowledge, Skills, Attitudes, Digital Technology Capabilities, Travel Agency Employees

SESSION 6

Resource Management

Utilization of Solar Panel Technology in Calbayog City

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Abstract

This study examines the utilization of solar panel technology in Calbayog City, focusing on its environmental, technical, economic, and social dimensions. The research surveyed 50 respondents to analyze their perceptions and experiences with solar panel technology utilization. Results indicate that hybrid solar panel systems are the most commonly used, followed by on-grid and off-grid systems. Respondents strongly agreed that solar panel technology contributes positively to environmental sustainability, reducing reliance on fossil fuels and minimizing pollution. From a technical perspective, respondents acknowledged improvements in solar panel efficiency and integration with existing electrical grids. Economically, solar panels were perceived as cost-effective over time despite high initial investments. Socially, solar energy was seen as a driver for energy independence and community empowerment. Correlation analysis showed no significant relationships between the type of solar panel utilized and respondents' demographic factors such as age, family size, or income. Challenges identified include high initial costs, limited financing options, efficiency limitations, and knowledge gaps about solar technology. Despite these barriers, the study highlights strong support for solar panel adoption and its benefits for sustainable energy development. The findings suggest that increased government incentives, better financing schemes, and educational initiatives can further enhance solar energy utilization in Calbayog City.

Keywords: Solar Panel, Environmental Aspect, Technical Aspect, Economic Aspect, Social Aspect

Water Analysis of Drinking Water in San Antionio, Northern Samar

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Abstract

Water is arguably the most basic and most important part of everyday life. Yet, clean and safe drinking water is still a dream for billions of people worldwide. The "Philippine Clean Water Act of 2004" envisions providing safe and accessible drinking water. The study aimed to analyze the drinking water in San Antonio, Northern Samar. In analyzing drinking water, the following parameters were used: physical, chemical, and microbiological parameters of the source of drinking water. It employed descriptive-assessment research with the laboratory analysis of the water samples. Three Barangays from San Antonio, Northern Samar, Brgy. Vinisitahan, Brgy. Pilar and Brgy. Manraya was the identified barangay that passed the criteria, as its main source of drinking water is from a publicly owned Jet Matic pump. It was discovered that a high concentration of suspended particles does not affect water quality. Samples of water from Brgy. Manraya and Brgy. Pilar has an acidic pH level, making it unfit for human consumption. The same barangay was revealed to have a high total alkalinity level that indicates water contamination, while other parameters were undetectable and show nonsignificant factors to any water-related issues. All water samples from the identified Barangay submitted for microbiological components show that all water sources are contaminated with coliform and bacteria, suggesting a potential risk for waterborne diseases. The environmental structure of the Jet Matic pump also affects the quality of drinking water sources. Most of them are not in good shape, and the surrounding area also affects water quality.

Keywords: Water Analysis, Drinking Water, Physical Property of Water, Chemical Property of Water, Microbial Property

Exploring Blockchain Technology for Enhancing Waste Source Tracking and Data Transparency in the Philippines

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Abstract

The Philippines faces increasing challenges in waste management due to rapid urbanization, industrialization, and population growth. One major issue is the lack of accurate, real-time data on garbage sources, which limits the effectiveness of policies and programs. Existing waste monitoring systems are often outdated, fragmented, and poorly integrated across government units and industries. This review explores the feasibility of using blockchain technology to enhance waste source tracking and improve data transparency in the country. The study aims to analyze trends in waste generation and identify key sources, evaluate limitations in current data collection systems, and assess how blockchain can be applied to address these challenges. Methods used include documentary analysis, trend and gap analysis, and a literature review of global and local studies on blockchain in environmental management. Findings reveal that regions such as CALBARZON and Metro Manila generate the most waste, especially from industrial activities. However, critical gaps exist in how waste data is recorded, shared, and verified. Blockchain technology offers potential benefits such as data security, real-time tracking, and decentralization, which could significantly improve waste management systems. The study concludes that a blockchain-based web application is a feasible solution for improving transparency and coordination among stakeholders. It recommends piloting such systems in high-waste urban areas and integrating them into national waste reporting frameworks to support Sustainable Development Goals on sustainable cities and communities, responsible consumption, and climate action.

Keywords: Blockchain Technology, Data Transparency, Web Application, Solid Waste Monitoring, Digital Waste Solutions

Harmonizing Sustainable Leadership Practices in Schools with Department of Education's Long-Term Goals

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Abstract

This transformative study examines how sustainable leadership can be effectively aligned with the Department of Education's long-term goals, offering a compelling vision for building inclusive, resilient, and future-ready schools in the Philippines. Using a robust mixed-methods approach, it draws insights from school leaders, teachers, and DepEd officials in Bayawan City—uncovering how visionary planning, inclusive education, and strong stakeholder partnerships are already driving meaningful change on the ground. Despite persistent challenges such as limited resources and resistance to innovation, the study highlights how school leaders are adapting through collaboration, environmental stewardship, and ongoing professional development. At the heart of this work is the creation of the SCHOOL Leadership Framework—a practical, evidence-based model that empowers schools to institutionalize sustainable practices aligned with DepEd's Basic Education Development Plan 2030. More than just academic inquiry, this research is a call to action for policymakers, educators, and communities. It urges strategic investment in leadership development, cross-sector collaboration, and policy reforms that support long-term educational sustainability. By turning challenges into opportunities, the SCHOOL Framework offers a clear and actionable roadmap to ensure that Philippine education remains equitable, high-quality, and responsive to the demands of the 21st century.

Keywords: Sustainable Leadership, Educational Goals, Educational Transformations, Inclusive Education, SCHOOL Framework

Living, Learning, and Leading: Lived Experiences of Students with Sensory and Physical Impairments

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Abstract

College life is demanding due to its academic challenges; however, it poses even greater difficulties for students with sensory and physical impairments due to the additional barriers they face in accessing resources and participating fully in classroom activities. This study explored the lived experiences of these students through a descriptive phenomenological qualitative approach. Data were collected via interviews and analyzed using thematic analysis with three coding systems. Four key themes emerged from the analysis: Adapting and Thriving Academically, Fostering Inclusivity, Empowering Self-Advocacy, and Valuing Individuality. These findings highlight the strategies and support systems that enable students with impairments to navigate and succeed in the college environment. It is concluded that fostering inclusive educational practices and empowering self-advocacy are essential to enhancing academic success and well-being for students with sensory and physical impairments. Thus, educational institutions may consider implementing comprehensive accessibility policies, and promoting awareness programs to create a more inclusive and supportive learning environment for students with sensory and physical impairments.

Keywords: Sensory Impairment, Physical Impairment, Inclusivity, Phenomenology

The Effects of Destination Antecedents and Tourist Judgments and Feelings on Destination Tourist Resonance: A Mediation and Moderation Analyses

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Abstract

This study investigated the effects of destination antecedents, tourist judgments, and feelings on destination tourist resonance, focusing on Coron, Palawan. Anchored in the Tourist-based Brand Equity model, the research examined how destination salience, performance, and imagery influence tourist loyalty and emotional connections, with tourist judgments and feelings serving as mediators. The study also evaluated the moderating role of destination branding in these relationships. Employing a predictive-causal research design, data were collected through structured surveys administered to tourists who visited Coron. Partial Least Squares Structural Equation Modeling (PLS-SEM) was used to analyze the causal relationships between the constructs. The findings indicate that destination salience significantly affects destination performance, imagery, and tourist resonance. Destination performance and imagery, along with tourist judgments and feelings, were found to mediate the relationship between destination salience and tourist resonance, highlighting the importance of both cognitive and emotional evaluations. However, the moderating role of destination branding showed no significant impact on these relationships, suggesting the need for more cohesive branding strategies. This research addressed gaps in the application of brand equity models to emerging destinations and provided insights for enhancing localized branding strategies. Practical recommendations include the formulation of a Municipal Tourism Marketing and Promotions Plan (MTMPP) to improve Coron's branding and marketing efforts.

Keywords: Destination Branding, Sustainable Tourism, Destination Management, Tourist-based Brand Equity Model, Palawan Philippines

Factors Influencing the Use of Freelance Platforms in Medical Labor Markets

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Abstract

This study examines the factors influencing Thai medical professionals' intention to utilize freelance platforms. Through a survey of 118 respondents, we assessed the effects of Job Characteristics (JC), Technology-Related Factors (TRF), Social Factors (SF), and Personal Factors (PF) using regression analysis. JC was the strongest predictor, followed by TRF and SF, while PF was not statistically significant. The model explained 88.3% of the variance in intention. This suggests that platforms should emphasize job flexibility, usability, and social influence in their designs.

Keywords: Freelance Platforms, Medical Labor Market, Job Characteristics, Technology Adoption, Thailand

Administrators' Best Practices in Resource Management and Their Performance in the Department of Information and Communications Technology in the National Capital Region

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Abstract

This study aimed to assess administrators' best practices in resource management and their performance in the Department of Information and Communications Technology (DICT) in the National Capital Region (NCR). Utilizing a descriptive-correlational research design, the study involved 56 respondents, composed of 11 administrators and 45 employees. Data were collected through a researcher-made questionnaire, validated by three research experts, and rated using a four-point Likert scale. Statistical tools employed included frequency, percentage, weighted mean, Pearson product-moment correlation, and independent samples t-test. Findings revealed that DICT-NCR administrators consistently implement resource management practices, particularly in planning, budgeting, and human resource development. However, areas such as stakeholder participation, supplier evaluation, equitable training opportunities, feedback mechanisms, and ICT training and maintenance require improvement. Administrators also demonstrated generally favorable performance in goal setting, task execution, compliance, leadership, and stakeholder engagement. Nevertheless, aspects such as participatory decision-making, transparency in fund usage, and responsiveness to delays need further enhancement. Statistical analysis showed no significant correlation between administrators' resource management practices and their performance ($r = –0.018$, $p = 0.957$), suggesting that effective resource use does not necessarily result in higher performance. A significant difference was found between the self-assessments of administrators and the assessments made by employees in both domains, indicating a perception gap that may impact internal trust and organizational communication. Based on the findings, an Administrative Improvement Framework is recommended, emphasizing participatory planning, performance-based resource management, equitable professional development, inclusive evaluation systems, and strengthened ICT infrastructure to promote transparency, efficiency, and digital governance within DICT-NCR.

Keywords: Resource Management, Administrator Performance, DICT, Digital Governance

The Administrative and Supervisory Practices of Punong Barangays in Quezon City: Implications for Good Governance

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Abstract

This study assessed the administrative and supervisory practices of Punong Barangays in Quezon City and their implications for good governance. Utilizing a descriptive-correlational research design, data were gathered from 1,136 respondents, consisting of 142 Punong Barangays and 994 constituents. A researcher-made questionnaire based on a four-point Likert scale was employed, and data were analyzed using frequency, percentage, weighted mean, and Pearson's r. Findings revealed that administrative practices among Punong Barangays are generally effective, particularly in planning and goal-setting, where objectives are clearly defined and aligned with community needs. However, challenges persist in integrating barangay initiatives with city-wide programs, maintaining transparent documentation, and ensuring consistent implementation of participatory policies. Supervisory practices were also rated effective, especially in areas such as personnel management, conflict resolution, and oversight. Nonetheless, inconsistencies were observed in performance evaluation, participatory supervision, and equitable access to information. While fairness and teamwork emerged as strengths, inclusive decision-making remains an area for improvement. A statistically significant positive correlation was found between administrative and supervisory practices and the principles of good governance—namely, transparency, accountability, participation, responsiveness, and efficiency. However, a notable perception gap was identified between Punong Barangays and their constituents, with barangay officials consistently rating themselves more favorably. This suggests a need for citizen-inclusive evaluation mechanisms. The study concludes that although Punong Barangays demonstrate competence in key areas of governance, improvements are needed in transparency, stakeholder engagement, and the consistent implementation of policies. A Barangay Governance Enhancement Program (BGEP) is recommended to strengthen planning, reporting, performance evaluation, and participatory feedback. Capacity-building initiatives that emphasize accountability and citizen participation are essential to fostering effective, inclusive, and responsive barangay leadership in Quezon City.

Keywords: Administrative Practices, Supervisory Practices, Good Governance, Punong Barangay

Exploring Artificial Intelligence in Higher Education: Faculty Perspectives on Equity and Accessibility

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Abstract

This study explored faculty perspectives on artificial intelligence in higher education, with particular focus on equity and accessibility at Northwest Samar State University during 2024-2025. Using descriptive phenomenology, the research examined how six purposively selected faculty members perceive, experience, and navigate AI implementation in teaching. Data collected through in-depth interviews revealed that faculty recognize AI as potentially transformative for democratizing learning resources, personalizing education, and overcoming traditional barriers. However, significant challenges persist, including limited internet connectivity, device access, financial barriers to premium features, and technical literacy gaps. Faculty identified implementation opportunities through personalized learning support, expanded information access, and strategic integration approaches that prioritize equity. The absence of clear institutional policies created inconsistent adoption patterns, with some faculty developing independent guidelines while others await formal direction. Limited training opportunities led to reliance on self-directed learning and peer collaboration. Based on these findings, an AI Integration Framework for Ethical and Inclusive Teaching was developed, featuring phased implementation approaches, infrastructure development strategies, pedagogical integration methods, and continuous evaluation mechanisms. This framework addresses x both immediate tactical adaptations and longer-term strategic initiatives to ensure AI implementation enhances rather than undermines educational equity across diverse student populations.

Keywords: Artificial Intelligence, Education, Perspectives, Equity, Accessibility, Inclusivity

Development of Client Feedback system for Frontline Services of NwSSU

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Abstract

Frontline services are critical touchpoints for organizations, yet many institutions lack systematic feedback mechanisms to evaluate and improve service quality. This study developed a client feedback system for Northwest Samar State University's frontline services to enhance service delivery and organizational effectiveness. A descriptive development research design was employed during the 2022-2023 academic year. The system was evaluated using ISO 25010:2011 standards by 13 IT experts (Software Quality Product Model) and 200 frontline service providers and students (Quality in Use Model). Simple random sampling and purposive sampling techniques were utilized for participant selection. IT experts rated the system "Excellent" across all criteria with an overall weighted mean of 4.56, including functional suitability (4.59), performance efficiency (4.56), usability (4.56), reliability (4.60), security (4.58), maintainability (4.54), and portability (4.49). Users evaluated the system as "Excellent" overall (4.24), rating effectiveness (4.07), efficiency (4.28), satisfaction (4.29), freedom from risk (4.23), and context coverage (4.31) highly. The system successfully met university requirements by providing a robust, user-friendly, and secure platform for collecting client feedback. High ratings across technical and user experience dimensions validate the system's alignment with organizational needs and ISO quality standards.

Keywords: Client Feedback System, Frontline Services, ISO 25010:2011, Software Quality Evaluation, Higher Education

Enhancing Public Service Efficiency Through Strategic Management in the National Transmission Corporation

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Abstract

This study aimed to examine how strategic management practices enhance public service efficiency within the National Transmission Corporation (TransCo). Employing a descriptive-correlational research design, the study utilized a researcher-made questionnaire, validated by field experts and pilot-tested for reliability. The instrument used a four-point Likert scale and was administered to 170 stratified randomly selected employees from various departments, composed of technical staff, administrative personnel, supervisors, and department managers. Statistical tools such as frequency and percentage, weighted mean, Pearson product-moment correlation coefficient, and one-way analysis of variance (ANOVA) were used to analyze the data. The findings revealed that the respondents represent a diverse and experienced workforce—primarily male, married, highly educated, and mostly serving in administrative or support roles. The implementation of strategic management practices in TransCo was rated positively, especially in aligning goals with national energy priorities and adopting digital innovations. However, gaps were identified in employee training, resource tracking, and stakeholder engagement. Public service efficiency was also perceived favorably in terms of timeliness, operational productivity, and customer satisfaction, although issues such as limited feedback utilization and procedural inefficiencies were noted. A strong and significant positive correlation ($r = 0.71$, $p = 0.018$) was found between strategic management practices and public service efficiency, highlighting the critical role of effective planning, performance monitoring, stakeholder collaboration, and innovation. Significant differences in efficiency ratings were observed when respondents were grouped according to age, civil status, educational attainment, length of service, and position—but not gender. The study recommends enhancing TransCo's strategic management systems through inclusive planning, performance-based decision-making, digital integration, employee development, and stakeholder participation to promote transparency, accountability, and service excellence in the public sector.

Keywords: Strategic Management, Public Service Efficiency, Operational Productivity, Stakeholder

Administrators' Best Practices in the Management of Resources and the Performance of Chiefs of Public Hospitals in Quezon City

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Abstract

This qualitative study explored the best practices of hospital administrators in managing resources and enhancing the performance of hospital chiefs in public hospitals in Quezon City. Anchored in a phenomenological research design, the study sought to understand the lived experiences, perspectives, and strategies of healthcare leaders within the constraints of the public health system. A total of 38 participants—comprising 19 hospital administrators and 19 hospital chiefs—were selected through purposive sampling. Data were collected using a researcher-developed interview guide validated by three subject matter experts. The study utilized in-depth interviews, focus group discussions (FGDs), observations, and document analysis. Thematic analysis was employed to interpret the data and identify emerging patterns. Findings revealed that effective resource management is primarily influenced by a collaborative leadership dynamic. Administrators adopt strategic and facilitative roles, while hospital chiefs provide operational leadership. This complementary relationship fosters efficiency, mutual trust, and professional development. Despite ongoing challenges such as financial constraints, bureaucratic delays, infrastructure limitations, and staff shortages, both groups demonstrated resilience through transparent communication, inclusive planning, and creative problem-solving. Administrators were found to significantly support chiefs by offering data-driven tools, promoting participatory planning, conducting performance evaluations, and encouraging leadership development. Key governance issues—such as overlapping mandates, red tape, and leadership capacity gaps—were acknowledged yet addressed through mutual respect and continuous collaboration. Recommendations include strengthening administrator–chief partnerships through inclusive planning and shared decision-making structures; adopting unified digital systems for inventory and performance monitoring; institutionalizing leadership coaching and cross-training; and streamlining bureaucratic processes. Wellness initiatives, recognition systems, and shared learning platforms were also emphasized as essential for sustaining morale and fostering innovation.

Keywords: Hospital Leadership, Resource Management, Hospital Administrators, Public Health Bovernance

Administrators' Best Practices in the Management of Resources and Performance of Heads of Office in the National Commission for Indigenous Peoples in North Cotabato

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Abstract

This study explored the administrators' best practices in the management of resources and the performance of heads of office in the National Commission for Indigenous Peoples (NCIP) in North Cotabato. A qualitative phenomenological research design was employed to gain in-depth insights into the lived experiences of nine administrators and thirteen heads of office. The study aimed to identify leadership and supervisory practices; determine how administrative strategies, such as planning and decision-making, affect service delivery to Indigenous communities; assess the impact of collaboration and communication between NCIP administrators and heads of office; and explore which best practices in resource management and leadership should be sustained, improved, or institutionalized. Data were collected through key informant interviews (KIIs) using a researcher-made, open-ended questionnaire validated by three experts. In-depth interviews and focus group discussions were conducted, and the data were analyzed thematically. Ethical standards were strictly observed throughout the research process. Findings revealed that NCIP administrators and heads of office employ joint planning and resource-sharing strategies. However, persistent challenges such as delayed funding and limited logistics—particularly in geographically isolated areas—hinder timely and effective service delivery. Leadership and supervisory approaches emphasizing collaboration, transparency, and empowerment were found to positively influence office performance. Participatory planning and community-informed decision-making contribute to culturally sensitive and responsive programs, while top-down strategies often lead to inefficiencies. Strong collaboration and consistent communication between administrators and heads of office are essential for successful program implementation. Supportive practices, including consultation, logistical assistance, and emotional encouragement, promote resilience and improved outcomes. This study recommends streamlining financial disbursements, adopting bottom-up planning strategies, strengthening internal communication, and developing standardized policy frameworks to support continuous improvement and institutional sustainability.

Keywords: Administrative Best Practices, Resource Management, Indigenous Communities, NCIP, Leadership Performance

Administrators' Best Practices in the Management of Resources and Performance of Heads of Office in the National Commission for Indigenous Peoples in Selected Cities in Metro Manila

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Abstract

This study assessed the administrators' best practices in the management of resources and the performance of heads of office in the National Commission for Indigenous Peoples (NCIP) in selected cities in Metro Manila. Utilizing a descriptive-correlational research design, the study employed a researcher-made questionnaire validated by three experts and administered through Google Forms. A four-point Likert scale was used to measure responses from a total of 64 participants, including 16 administrators and 48 heads of office (division chiefs, unit heads, and section heads). Data were analyzed using frequency and percentage, weighted mean, Pearson's r correlation, and independent samples t-test. Findings revealed that NCIP administrators demonstrate strong and consistent best practices in resource management, particularly in the areas of financial and human resource administration, critical components of institutional effectiveness and public service delivery. Likewise, heads of office were perceived as competent and effective in achieving goals, engaging stakeholders, and ensuring accountability, reflecting their alignment with the NCIP's strategic direction. A statistically significant and strong positive correlation ($r = 0.68$, $p < .05$) was found between administrators' best practices and the performance of heads of office, indicating that effective resource management directly contributes to leadership performance. A statistically significant difference ($p = .024$) emerged in how the two groups assessed best practices, with administrators rating their implementation more favorably. However, no significant difference was found in their assessments of performance ($p = .152$), suggesting a shared understanding of leadership expectations and outcomes. The study recommends enhancing reward and recognition systems, institutionalizing participatory feedback mechanisms, improving outreach to geographically isolated Indigenous Cultural Communities/Indigenous Peoples (ICCs/IPs), investing in digital infrastructure, and developing a Performance Enhancement Program (PEP) tailored to the NCIP's administrative and cultural context.

Keywords: Best Practices, Resource Management, Performance, NCIP, Administrative Leadership, Indigenous Peoples

Proposed Design of Portable Emergency Shelter in Tacloban City, Leyte

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Abstract

The Philippines, situated along the Pacific Ring of Fire and typhoon belt, frequently suffers from natural disasters that displace millions and expose gaps in emergency shelter infrastructure. This study addresses the urgent need for resilient, humane, and rapidly deployable emergency housing by proposing Sirongan, a portable emergency shelter designed for post-disaster use in highly vulnerable areas like Tacloban City, Leyte. The objectives include assessing structural, environmental, and logistical needs; exploring sustainable materials; and developing a shelter model incorporating renewable energy. Utilizing the ADDIE methodology—Analysis, Design, Development, Implementation, and Evaluation—the research gathered survivor feedback, reviewed disaster literature and case studies, and consulted technical experts. The resulting design features interlocking modular panels, solar energy integration, passive ventilation, and a collapsible structure for rapid deployment. Evaluation by disaster response professionals affirmed its practicality and adaptability. The study concludes that the Sirongan shelter is a scalable, community-centered solution addressing both immediate and long-term needs of disaster survivors. It is recommended for adoption by government agencies and humanitarian organizations to enhance national disaster resilience efforts.

Keywords: Emergency Shelter Design, Disaster Resilience, Modular Construction, Renewable Energy, Architecture in Humanitarian Crises

Administrators' Best Practices in the Management of Resources and Performance of Chiefs of Public Hospitals in Manila

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Abstract

This qualitative phenomenological study explored the best practices of administrators in managing resources and enhancing the performance of hospital chiefs in 11 public hospitals in Manila. A total of 22 key informants—comprising 11 administrators and 11 chiefs—were interviewed using a researcher-developed instrument. The tool was validated by three research experts and pilot-tested with three individuals not included in the main study to ensure clarity, reliability, and validity. Data were collected through Key Informant Interviews (KIIs) and complemented by observational techniques to capture natural behaviors, interactions, and leadership practices. Thematic analysis revealed key leadership strategies that contributed to effective hospital management. Administrators and chiefs consistently exhibited collaborative, adaptive, and empowering leadership styles that improved operational efficiency and resilience. Strategic communication, shared governance, data-informed planning, and emotional support emerged as essential themes. Transparent and participatory approaches to budgeting, staffing, and procurement allowed for the optimal use of limited financial, human, and material resources. Mentorship, emotional intelligence, and professional development further strengthened leadership capacity and fostered trust among stakeholders. Participants also described agile responses to resource limitations, including real-time resource reallocation, cross-functional teamwork, and community partnerships. Best practices such as performance-based incentives, digital communication tools, and decentralized leadership structures were associated with enhanced service delivery and organizational effectiveness. Looking ahead, participants emphasized the importance of digital transformation, policy reform, and investments in human capital to sustain leadership gains and institutional improvements. Based on these findings, the study recommends formalizing inclusive leadership systems, expanding mentorship and training programs, strengthening crisis-preparedness mechanisms, and supporting decentralized governance. These insights contribute to the growing body of knowledge on effective hospital leadership and offer practical implications for improving public healthcare delivery through strategic resource management.

Keywords: Hospital Administration, Resource Management, Leadership Practices, Healthcare Governance

Student Services Programs of NwSSU

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Abstract

The International Association of Student Affairs and Services (IASAS) continues to play a pivotal role in consolidating and professionalizing student affairs globally. Recent publications highlight IASAS's commitment to improving communication and sharing of professional development experiences, such as best practices, internships, exchanges, conferences, colloquia, and symposia. For example, the 2023 monograph Towards Professionalization of Student Affairs Across the Globe (Bardill Moscaritolo & Schreiber, 2023) delves into how student affairs are professionalizing worldwide, emphasizing the sharing of global knowledge, theory, and practice to advance the field1. Additionally, Global Perspectives on Student Affairs and Services (Schreiber, Ludeman, Glass, & Blanco, 2020) provides comprehensive coverage of foundational issues and best practices in student affairs, reinforcing the importance of international collaboration and knowledge exchange facilitated by IASAS The status of implementation of student services programs of NwSSU on terms of student welfare, student development, and institutional student services programs was very satisfactory. There is no significant difference in the status of implementation of student services programs of NwSSU in terms of student welfare, student development, and institutional student services programs with the different program components such as objectives, personnel, projects/activities, budget, facilities/equipment and monitoring and evaluation. The primary problems in the implementation of student services programs of NwSSU includes lack of qualified personnel, lack of facilities and equipment and lack of cooperation among partner agencies. Recommendations such as seminars / sessions on Personality Development Program and Proper Handling of Student Services Clients be conducted by the SAS Personnel; increase the number of personnel in the Registrar's Office, Guidance Office and Medical – Dental Clinic; hire licensed, educationally qualified librarians and guidance counselors; increase the budget allocation for the purchase of medicines; have a separate room for testing and group counseling purposes; procure additional copies of test materials; update the facilities and equipment in every SAS Unit, especially, the units with fiduciary fund.

Keywords: Student Welfare, Student Development, Monitoring, Student Services, Implementation

Gazing at the Efficacy and Management Strategies of Vice Presidents for Administration in State Universities in Eastern Visayas

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Abstract

This study examined the efficacy and management strategies of Vice Presidents for Administration (VPAs) in state universities across Eastern Visayas, Philippines, addressing critical gaps in understanding administrative leadership effectiveness in higher education institutions. A quantitative descriptive-analytical design was employed with 220 respondents comprising 10 university presidents, 10 VPAs, 100 faculty members, and 100 non-teaching personnel from ten state universities. Data were collected using validated questionnaires measuring efficacy levels and management practices, analyzed through descriptive statistics and Pearson correlation. VPAs demonstrated high efficacy overall (M=3.41), excelling particularly in Human Resource Management (M=4.13) and Strategic Leadership (M=3.43). Management practices showed moderate effectiveness (M=3.25), with Resource Allocation scoring highest (M=3.43). Strong positive correlations emerged between age, educational attainment, years of service, and leadership efficacy. Budget constraints (90%) and bureaucratic processes (90%) were identified as primary barriers. While VPAs exhibit strong leadership capabilities, opportunities exist for improvement in stakeholder relations, research innovation, and policy development. Experience and education significantly influence administrative effectiveness, suggesting the importance of continuous professional development in enhancing institutional governance.

Keywords: Vice Presidents for Administration, Higher Education Leadership, Administrative Efficacy, Management Practices, Eastern Visayas

Status of Science Teaching Laboratories of State Universities and Colleges in One Region of the Philippines: Basis for Plan of Action

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Abstract

The laboratory has been given a prominent place in science instruction. A five-year laboratory development plan was created using the descriptive-assessment research approach to determine the current state of science teaching laboratories in Region VIII's public higher education establishments. The facilities, equipment and supplies, and upkeep of science teaching laboratories in state universities and colleges were deemed of the highest quality. However, attitudes about the state of science teaching laboratories varied widely across the three groups of respondents. Using Scheffe's test, the data was submitted for numerous comparisons, revealing significant discrepancies between participants' perceptions of the situation. According to the Study, students and science instructors had very different views on the adequacy and sufficiency of present facilities, equipment, and supplies and the preservation of SUC scientific teaching laboratories. The laboratory procedures in charge were established regarding purchasing laboratory facilities and equipment, laboratory organization, utilization, and control. The laboratory director was only "often" involved in such activities, according to the findings. The null hypothesis is rejected due to considerable disparities in perceptions among the three groups of respondents. Students' and scientific professors' opinions differed significantly when data were subjected to multiple comparisons using Scheffe's test. So, according to these data, students who were charged with failing to carry out their responsibilities and obligations in scientific labs had a substantial impact. Sticking to the lab's current development strategy could be a reasonable alternative.

Keywords: Science Teaching, Laboratories, College Students, Schef e's Test, Science Courses

School Safety and Security Among Selected Schools: Basis for Safety Protocols

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Abstract

This study investigated the level of awareness of the school personnel in terms of school building safety protocols, basic first aid, school hazard drills, and child protection policies in the different schools in Department of Education – Division of Taguig City and Pateros, Philippines. Specifically, this study aimed to answer the research question: What is the level of awareness of the school in terms of (a) School Building Safety, (b) School Hazard Drills, (c) Basic First Aid, and (d) Child Protection Policy. Utilizing a descriptive-survey research design, data were collected from 273 respondents from six (6) schools covered by the DepEd Taguig and Pateros. The results indicated that that there are several areas where school personnel exhibit strong awareness and participation, but also areas of concern and potential improvement. In terms of personnel profiles, the data highlights the diverse demographic distribution among school personnel and the varying levels of training received in school safety and health protocols. While most teaching personnel seem engaged in DepEd-initiated programs, there are still significant portions of teaching, non-teaching, and watchman/security personnel lacking relevant training. In terms of the Child Protection Policy, the findings emphasize the importance of ensuring all school personnel are properly trained and aware of the policy's guidelines. Despite the recognition of its significance, there are still notable gaps in training and awareness, particularly among watchman/security personnel. In the area of school construction safety, while there seems to be a good understanding among teaching and non-teaching personnel, there are discrepancies in ratings from watchman/security personnel, indicating potential areas for improvement in training and communication. The high participation rates in drills and exercises among all school personnel demonstrate a proactive approach to disaster preparedness, yet there are still gaps in certain areas such as armed conflict preparedness and familiarity with incident command areas. In terms of basic first aid, while there is generally good theoretical knowledge across all school personnel, practical application and specific skills such as CPR and bandaging techniques appear lacking. Generally, the data highlight both strengths and areas for improvement in school safety protocols, emphasizing the importance of ongoing training and education for all school personnel to ensure the safety and well-being of students and staff alike. The implications of this research were far-reaching, providing actionable insights for persons involved such as school head and administrators This study suggests the need for more comprehensive training initiatives to ensure all school personnel members are equipped with the necessary skills to ensure school safety.

Keywords: School Safety, Security, First Aid, Hazard Drills, Child Protection

Exploring Transformational Leadership Practices and Their Influence on Employee Motivation: Basis for Developing a Model of Effective Leadership Behaviors

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Abstract

This qualitative study explored the transformational leadership practices within a mid-sized organization and examined their influence on employee motivation, serving as a basis for developing a model of effective leadership behaviors. Using a phenomenological approach, in-depth semi-structured interviews were conducted with ten participants, including a Director, Department Head, Supervisor, Human Resource Manager, and six employees. Data collection was supported by audio recordings and document analysis, with thematic analysis employed to interpret the data. Ethical protocols, including informed consent and confidentiality, were strictly observed throughout the research process. The findings revealed that transformational leadership significantly enhances employee motivation, engagement, and organizational commitment. Leaders demonstrated behaviors such as visionary influence, empowerment, emotional support, role modeling, and open communication. Employees consistently expressed feeling valued, heard, and trusted, which contributed to a stronger sense of purpose, increased confidence, and a deeper commitment to their work. Leadership was perceived not merely as directive but as relational and emotionally intelligent, focused on developing meaningful connections and aligning personal and organizational goals. Both leaders and employees emphasized the importance of ethical consistency, recognition, transparency, and daily acts of encouragement as foundational elements of effective leadership. These behaviors contributed to a culture where motivation is cultivated through trust, inclusion, and shared purpose rather than through authority alone. The convergence of perspectives between leaders and employees underscored the value of modeling integrity, empowering teams, and communicating a clear vision. Based on these insights, the study proposes a leadership behavior model grounded in transformational principles, highlighting five essential dimensions: leading by example, empowering with trust, providing emotional and professional support, recognizing contributions, and fostering purposeful communication. This model offers practical guidance for organizations seeking to develop people-centered leaders who can inspire, engage, and retain talent in dynamic workplace environments.

Keywords: Transformational Leadership, Employee Motivation, Leadership Behaviors

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