



**UNIVERSITAS
AN NUUR**
PURWODADI

BOOK OF ABSTRACT

THE 2nd AN NUUR INTERNATIONAL CONFERENCE

on Health, Education, Business,
Science and Technology

(AICHEBEST)

**From Digital Transformation
to Sustainable Development :**

*Advancing Multidisciplinary Innovation
for Creating Impact and
Shaping the Future*



HEALTH



EDUCATION



BUSINESS



SCIENCE



TECHNOLOGY



17 – 18 June 2026



**Universitas An Nuur
Purwodadi, Indonesia**



BOOK ABSTRACT
THE 2ND AN NUUR INTERNATIONAL CONFERENCE
on HEALTH, EDUCATION, BUSINESS, SCIENCE AND TECHNOLOGY
(AICHEBEST)

**FROM DIGITAL TRANSFORMATION TO SUSTAINABLE
DEVELOPMENT : ADVANCING MULTIDISCIPLINARY
INNOVATION FOR CREATING IMPACT AND SHAPING THE
FUTURE**



AN NUUR UNIVERSITY
2026

**BOOK ABSTRACT AICHEBEST 2 (AN NUUR INTERNATIONAL CONFERENCE ON
HEALTH, ECONOMICS, BUSINESS, EDUCATION, SCIENCE AND TECHNOLOGY)**

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BOOK ABSTRACT INTERNATIONAL CONFERENCE

Book Abstract of AICHEBEST 2 (AN NUUR International Conference on Health, Economics, Business, Education, Science, and Technology), with the theme "From Digital Transformation to Sustainable Development: Advancing Multidisciplinary Innovation for Creating Impact and Shaping the Future."

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ABSTRACT

The **2nd An Nuur International Conference on Health, Education, Business, Science and Technology (AICHEBEST 2026)** serves as an international scientific forum that brings together researchers, academics, practitioners, and students to disseminate multidisciplinary research addressing contemporary global challenges through digital transformation and sustainable innovation. This Book of Abstract compiles **52 peer-reviewed research abstracts** representing diverse disciplines, including health sciences, nursing, midwifery, pharmacy, education, business, economics, computer science, environmental science, and information technology.

The contributions highlight recent advances in digital health interventions, artificial intelligence, machine learning, educational technology, sustainable materials, public health, digital business transformation, and community empowerment. Several studies focus on technology-enabled healthcare solutions such as telehealth, health coaching applications, AI-based pregnancy education chatbots, and health literacy platforms. Other contributions explore data science applications, cybersecurity, natural language processing, ensemble machine learning, digital tourism, circular economy models, and educational innovations designed to improve learning outcomes and societal well-being.

Reflecting the conference theme, the collected works emphasize interdisciplinary collaboration as a catalyst for creating practical, evidence-based solutions that support the Sustainable Development Goals (SDGs). The proceedings demonstrate how emerging technologies can be integrated with scientific research and community engagement to address challenges in healthcare, education, industry, governance, and environmental sustainability. It is expected that this Book of Abstract will serve as a valuable academic reference, stimulate future international collaborations, and inspire innovative research that contributes to sustainable development and positive societal impact.

INTRODUCTION

Praise be to God Almighty for the successful holding of the Proceedings of AICHEBEST 2 (AN NUUR International Conference on Health, Economics, Business, Education, Science, and Technology), with the theme "From Digital Transformation to Sustainable Development: Advancing Multidisciplinary Innovation for Creating Impact and Shaping the Future."

These proceedings are a scientific forum that brings together various research results, studies, innovations, and ideas from scientists, researchers, practitioners, students, and stakeholders from various disciplines. Amidst the dynamics of technological development and increasingly complex global challenges, digital transformation has become a major factor driving change in various sectors of life. However, this development needs to be directed to support sustainable development that can have a real impact on society and the environment.

Through this theme, AICHEBEST 2 emphasizes the importance of multidisciplinary collaboration in creating innovative solutions that not only focus on technological advancement but also consider aspects of diversity, social welfare, economic growth, education quality, health, and strengthening governance that is adaptive to changing times.

These proceedings present various scientific contributions in the fields of health, economics and business, education, science, and technology. They are expected to serve as academic references and sources of inspiration for the development of scientific knowledge and the implementation of evidence-based policies. Each work produced is the result of thought and research that reflects the spirit of innovation aimed at creating a positive impact and shaping a better future.

Thanks are extended to all editors, reviewers, authors, committee members, and partners who contributed to the organization of the conference and the preparation of these proceedings. Our deepest appreciation is also extended to all participants who shared their knowledge and experiences, ensuring the success of this event.

We hope that the 2nd AICHEBEST will provide broad benefits, strengthen international collaborative networks, and become a concrete step in encouraging multidisciplinary innovation towards sustainable and impactful development for the future.

Purwodadi, 2026

Daftar Isi

BOOK ABSTRACT AICHEBEST 2 (AN NUUR INTERNATIONAL CONFERENCE ON HEALTH, ECONOMICS, BUSINESS, EDUCATION, SCIENCE AND TECHNOLOGY).....	3
BOOK ABSTRACT INTERNATIONAL CONFERENCE	4
ABSTRACT.....	5
INTRODUCTION	6
EFFECTIVENESS OF A WEBSITE AND BOOKLET-BASED HEALTH LITERACY MODEL ON METABOLIC SYNDROME MARKERS AMONG CIVIL SERVANTS: A QUASI-EXPERIMENTAL STUDY	19
THE RELATIONSHIP BETWEEN PERCEIVED VULNERABILITY AND SEVERITY OF MODERN AND HEALTHY CIRCUMCISION BEHAVIORS FROM A HEALTH BELIEF MODEL PERSPECTIVE.....	20
TECH-ENABLED INTERACTIVE HEALTH COACHING ON SELF-MANAGEMENT MOTIVATION IN TYPE 2 DIABETES MELLITUS: A QUASI-EXPERIMENTAL STUDY	21
EFFECTIVENESS OF EFFLEURAGE MASSAGE ON PAIN ADAPTATION ACTIVE PHASE OF FIRST STAGE LABOR	22
THE ROLE OF TELEHEALTH IN IMPROVING FOLLOW-UP VISIT ADHERENCE AMONG PATIENTS WITH HYPERTENSION	23
MUROTTAL AL-QUR'AN AUDIO THERAPY COMBINED WITH AMBIENT NATURE SOUNDS IMPROVES SLEEP QUALITY IN HOSPITALIZED STROKE PATIENTS: A PRE-EXPERIMENTAL STUDY	24
THE EFFECT OF CAREGIVER PSYCHOEDUCATION ON STRESS AND FAMILY ADAPTATION OF ELDERLY DEMENTIA CAREGIVERS	25
FAMILY ROLES AND KNOWLEDGE AS DETERMINANTS OF HEALTHY LIFESTYLE PRACTICES AMONG PATIENTS WITH HYPERTENSION IN PRIMARY HEALTH CARE.....	26
THE EFFECT OF WORK ENGAGEMENT, WORK MOTIVATION, AND JOB SATISFACTION ON TURNOVER INTENTION WITH ORGANIZATIONAL COMMITMENT AS AN INTERVENING VARIABLE ON NURSES AT GRETELINA HOSPITAL MAKASSAR.....	27
THE EFFECT OF PMR THERAPY ON PAIN LEVELS IN ELDERLY INDIVIDUALS WITH RHEUMATOID ARTHRITIS (RA)	28
THE RELATIONSHIP BETWEEN <i>HEALTH LITERACY</i> AND QUALITY OF LIFE AMONG OLDER ADULTS WITH HYPERTENSION AT BONTOMARANNU COMMUNITY HEALTH CENTER, SOUTH SULAWESI	29
EFFECTIVENESS OF DIAPHRAGMATIC BREATHING RELAXATION THERAPY IN REDUCING PAIN LEVELS AMONG PATIENTS WITH STROKE: A QUASI-	

EXPERIMENTAL STUDY	30
MEASURING SOCIAL SKILLS IN SCHOOL-AGE CHILDREN: A SCOPING REVIEW OF EXISTING ASSESSMENT INSTRUMENTS	31
THE RELATIONSHIP OF HB LEVELS AND NUTRITIONAL STATUS OF PREGNANT WOMEN TO THE INCIDENT OF LBW AT THE TAWANGHARJO HEALTH CENTER IN 2025	32
THE INFLUENCE OF QUALITY OF WORK LIFE AND WORK MOTIVATION ON JOB SATISFACTION OF NURSES IN THE INPATIENT INSTALLATION AT RSUP. TADJUDDIN CHALID MAKASSAR	33
THE RELATIONSHIP BETWEEN KNOWLEDGE AND ATTITUDE OF PREGNANT WOMEN TOWARDS THE INACCURACY OF INTEGRATED ANTENATAL CARE VISITS AT GABUS 2 PUBLIC HEALTH CENTER IN 2024	34
THE EFFECT OF A PREGNANCY EDUCATION CHATBOT ON THE ANXIETY LEVEL OF PREGNANT WOMEN WITH EMESIS GRAVIDARUM AT PURWODADI 1 PUBLIC HEALTH CENTER.....	35
THE EFFECTIVENESS OF MUNG BEAN PUDDING SUPPLEMENTATION ON THE NUTRITIONAL STATUS OF CHILDREN AGED 24–59 MONTHS IN POJOK VILLAGE, TAWANGHARJO COMMUNITY HEALTH CENTER WORKING AREA.....	36
TEA CONSUMPTION HABITS AND DIETARY PATTERNS AS RISK FACTORS FOR ANEMIA AMONG ADOLESCENT GIRLS: A CROSS-SECTIONAL STUDY	37
BLENDED LEARNING-BASED EARLY DETECTION STRATEGY TO REDUCE MATERNAL, INFANT MORTALITY, AND STUNTING IN CENTRAL JAVA	38
SPECTROSCOPIC CHARACTERIZATION AND CHEMOTAXONOMY OF VOLATILE COMPOUNDS FROM LOWLAND PAPUAN GOGAUKE (<i>CENTELLA ASIATICA</i> L. URBAN) EXTRACT AS AN ECO-FRIENDLY BIO-EXCELLENT PRODUCT.....	39
EFFECT OF SOLVENT POLARITY ON TOTAL FLAVONOID CONTENT OF OCIMUM BASILICUM LEAF EXTRACTS MEASURED AT 415 NM USING UV-VIS SPECTROPHOTOMETRY.....	40
DEVELOPMENT OF CHITOSAN ADSORBENT FROM RED KURISI FISH SCALES (<i>NEMIPTERUS VIRGATUS</i>)–TiO ₂ FOR LEAD (PB) ADSORPTION IN LEACHATE FROM BATU TERANG LANDFILL, BANTAENG REGENCY.....	41
GREEN-SYNTHESIS AND CHARACTERIZATIO OF COPPER NANOPARTICLES USING BASIL (<i>OCIMUM SANCTUM LINN</i>) LEAF EXTRACT AS A SUSTAINABLE BIOREDUCTANT	42
DIGITAL TRANSFORMATION AND SALES PERFORMANCE IMPROVEMENT OF SAMBELONO EATERY: EVIDENCE FROM A CULINARY SME IN SIDOARJO, INDONESIA.....	43
TALLENTBOOST GAMES PENGEMBANGAN PLATFORM GAMIFIED CAREER REDINESS ASSESMENT SEBAGAI STRATEGI INOVATIF DALAM MENINGKATKAN KESIAPAN KERJA SISWA SMA DAN MAHASISWA MELALUI SMART JOB RECOMMENDATION SYSTEM	44

GROBOGAN KULTURA: AN INTEGRATED DIGITAL PLATFORM FOR THE ADVANCEMENT OF CULTURAL TOURISM AND LOCAL MSMEs.....	45
IMPLEMENTATION OF ACCOUNTING INFORMATION SYSTEMS IN THE HUMAN RESOURCE MANAGEMENT CYCLE AND PAYROLL CYCLE OF CULINARY MSMES: A CASE STUDY AT YOLAND'S KITCHEN, GROBOGAN REGENCY.....	46
ANALYSIS OF THE DISPARITY BETWEEN REGULATION AND REALITY: EVALUATING THE IMPACT OF THE FREE NUTRITIOUS MEAL (MBG) PROGRAM ON THE INCOME AND PROFIT MARGINS OF TRADITIONAL MARKET TRADERS IN ARSO DISTRICT, KEEROM REGENCY, PAPUA.....	47
BEYOND HUMAN RESOURCE PRACTICES: A RESOURCE-BASED VIEW OF STRATEGIC HUMAN RESOURCE MANAGEMENT AND ORGANIZATIONAL PERFORMANCE IN ISLAMIC BANKING	48
EMPOWERING FARMER COMMUNITIES THROUGH CORN COB WASTE-BASED BIONEST FIBER INNOVATION FOR SUSTAINABLE CHILI CULTIVATION AND RURAL ECONOMIC GROWTH	49
TRANSFORMING WASTE INTO VALUE: A COMMUNITY-BASED CIRCULAR ECONOMY EMPOWERMENT MODEL IN GROBOGAN REGENCY	50
INTEGRATING THE SAVAR FRAMEWORK AND METAVERSE TECHNOLOGIES TO OPTIMIZE EDUCATIONAL MEDIA PRACTICALITY	51
CARBON DOTS (CDS) BASED ON KLUWAK SHELLS (<i>PANGIUM EDULE</i>) USING A MICROWAVE-ASSISTED TECHNIQUE FOR DETECTION OF HEAVY METAL LEAD (PB)	52
RANDOM FOREST-XGBOOST STACKING ENSEMBLE FOR TOXIC COMMENT DETECTION ON ROBLOX	53
COMPARISON OF RESAMPLING TECHNIQUES & MACHINE LEARNING ALGORITHM ON MATERNAL HEALTH RISK	54
LIMITATIONS AND ADVANCES OF ASSOCIATION RULE MINING AND FP- GROWTH ALGORITHMS FOR TIME-VARIANT TRANSACTION DATA IN THE FOOD & BEVERAGE INDUSTRY	55
MODEL HIBRID KEAMANAN KOMUNIKASI DATA MENGGUNAKAN FEDERATED LATTICE-BASED CRYPTOGRAPHY DAN HOMOMORPHIC STEGNOGRAPHY DENGAN OPTIMASI QUANTUM-RESISTANT PROTOCOL	56
ANALYSIS OF ALOE VERA AND LEAD (II) ACETATE ($\text{Pb}(\text{CH}_3\text{COO})_2$) COMPOSITE SYNTHESIS AS A CANDIDATE APRON MATERIAL.....	57
ENGLISH AS A GATEWAY TO GLOBAL MARKETS: A QUALITATIVE STUDY OF VANILLA BUYER OUTREACH	58
BRINGING BIOLOGY TO LIFE: DEVELOPING CANVA-ASSISTED ANIMATED COMICS FOR HUMAN SYSTEM LEARNING	59
STUDENT ENGAGEMENT IN BLENDED LEARNING ENVIRONMENTS: A SYSTEMATIC REVIEW OF EFFECTIVE DESIGN STRATEGIES AND PEDAGOGICAL IMPLICATIONS	60

THE BENEFIT OF ARTIFICIAL INTELLIGENCE (AI) IN ENGLISH LANGUAGE TEACHING	61
THE TRANSFORMATION OF PEDAGOGICAL COMPETENCE FROM THE DIGITAL ERA TO THE AI ERA	62
A SYSTEMATIC REVIEW: THE IMPACT OF DIGITAL PROFICIENCY ON TEACHER PROFESSIONAL DEVELOPMENT	63
A SYSTEMIC REVIEW ON THE ROLE OF AI IN TPACK'S IMPLEMENTATION	64
DIVIDEND POLICY, LEVERAGE, LIQUIDITY, AND FIRM VALUE: THE MEDIATING ROLE OF PROFITABILITY	65
MAPPING INDONESIAN HOAX NARRATIVES ACROSS SENTIMENT, TOPICS, TIME, ENTITIES, AND LANGUAGE PATTERNS	66



AN NUUR INTERNATIONAL CONFERENCE ON HEALTH, EDUCATION, BUSINESS, SCIENCE AND TECHNOLOGY **AICHEBEST**



THE ^{2nd} AN NUUR INTERNATIONAL CONFERENCE ON HEALTH, EDUCATION, BUSINESS, SCIENCE AND TECHNOLOGY

AICHEBEST

THEME

From Digital Transformation to
Sustainable Development :

*Advancing Multidisciplinary Innovation for
Creating Impact and Shaping the Future*

17 JUNE
2026

LIVE ON
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WELCOMING SPEECH



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Time	Activity	Person in Charge (PIC)
Opening		
08.00 – 08.15	Opening Ceremony: Opening by MC and singing the National Anthem Indonesia Raya	MC
08.15 – 08.25	Welcoming speech from the Rector of Universitas An Nuur	The Rector of Universitas An Nuur (Dr. Rosdiana, SKM., M.Kes.)
08.25 – 08.30	Prayer	
Keynote Speakers		
08.30 – 09.00	1 st Keynote Speaker's Presentation (Prof. Dr. Deshinta Arrova Dewi) INTI International University, Malaysia	Moderator 1
09.00 – 09.15	Q&A Session	
09.15 – 09.45	2 nd Keynote Speaker's Presentation (Prof. Muhammad Roil Bilad) Universitas Brunei Darussalam	
09.45 – 10.00	Q&A Session	
10.00 – 10.10	Short Break	
10.15 – 10.45	3 rd Keynote Speaker's Presentation (dr. Azzaky, Sp.PD., FINASIM.) Association of Indonesian Health Higher Education Institutions	Moderator 2
10.45 – 11.00	Q&A Session	
11.00 – 11.30	4 th Keynote Speaker's Presentation (Ns. Anita Lufianti, M.Kes., M.Kep.) Universitas An Nuur	
11.30 – 11.45	Q&A Session	
11.45 – 12.00	Closing & Documentation	MC
12.00 – 13.00	Break	
13.00 – 15.30	Parallel Sessions	Moderator
15.30 – 15.45	Closing speech	MC


 Rector of Universitas An Nuur
Dr. Rosdiana, SKM., M.Kes.



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No	Room	PIC	Peserta
1	Room Nursing 1	(pic: Malik)(mod : Gita)	1. Dr. Samsiana,SKM., M.Kes. 2. Ns. Purhadi S.Kep., M.Kep 3. Dr. Zainudin, S.Kep., M.Kep 4. Ns. Yusrah Taqiyah, S.Kep., M.Kes., M.Kep 5. St. Munawwarah. M.S.Kep.,Ns.,M.Kep 6. Dr.Musaidah.,S.Kep.,Ns.,S.KM.,M.Kes 7. Ns. Nurun Salaman Alhidayat, S.Kep., M.Kep., Sp.Kep.MB.
2	Room Nursing 2	(pic:Basidt)(mod : Puji Lestari)	1. Rahmawati Ramli.S.Kep.Ns.M.Kes.M.Kep 2. Ns. Hijrah S.Kep., M.Kes 3. Hj. Afriyana Amelia Nuryadin, SKM,. M.Kes 4. Sri Yulian H.S.Kep.,Ns.,M.Kep 5. Sri Ayu Rahayu Paneo 6. Normalia,S.Kep.Ns.M.kep 7. Ns. Evi Kusmayanti, S.Kep., M.Kep 8. Dr.Andi yaumil Bay R Thaifur, SKM.,M.Kes
3	Room Midwifery (Kebidanan)	(pic:desi)(mod :bintang)	1. Sri Wahyuni Bahrum,S.ST.,Bdn.,M.Keb 2. Bdn. Sehmawati,S.Sit., M.Keb 3. Anisatul Afidah 4. Wulan Yuniana Putri 5. PINTAM AYU YASTIRIN S.ST., M.Kes 6. Bdn. ROSMALA KURNIA DEWI, S.ST., M.Kes 7. Dr. Festy Mahanani, S.Keb., MPH
4	Room Pharmacy	(pic:adinda)(mod :anastsya kumasari)	1. Dr. Mingle A Pistanty, M.Pd 2. Apt. GIGIH KENANGA SARI,S.Farm,. M.Farm 3. Rahmaniah 4. Kurnia Ramadanani Karim.S.Si.M. Pd 5. Aruma Dini Asiandaru 6. Dhiva Mariska 7. Risky Eka Saputra
5	Room Management & Business 1	(pic:tisya)(mod :khoirul)	1. Dra.Wahyu Rochana, MBA,MM. 2. Adrian Surya Ibka Putra 3. Wahyu Setyowati 4. Zanuba Isna Aulia
6	Room Management & Business 2	(pic:essti)(mod : meta)	1. Leon Mitra Harju, SE., MM 2. Satria Avianda Nurcahyo, S.E., S.Hum.,M.M 3. Muhammad Hilal 4. Ana Widyaningsih
7	Room Computer Science (Ilkom)	(pic:aqlya)(mod : anjar asmara)	1. Dr.Ir.A.Muhammad Syafar.,A.Md.,S.T.,M.T.,IPM 2. Iqbal Sabilirasyad, S.ST., M.Tr.Kom 3. Nurul Fuadi, S.Si., M.Si 4. Kartika Imam Santoso, S.E., S.Kom.,M.Kom 5. Dhika Malita Puspita Arum, S.Kom., M.Kom 6. Andri Tryono S.T., M.T 7. Erika Dwi Saputra 8. Sri Zelviani, S.Si., M.Sc
8	Room Education (PBI)	(pic:muttia)(mod :azzalea)	1. Rahmatul khasanah. S. Pd., M. Pd 2. Suriyah Satar, M.Pd 3. Etika Dewi Kusumaningtyas, M.Pd 4. Roisa Nur Wakhidah



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			5. Dian Oktaviani 6. Khoirotun Nisa 7. Putri Isna Fatmawati
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Backgroun Zoom





No	Nama	Judul	Afiliasi
1	Dr. Samsiana,SKM., M.Kes.	Efektivitas Model Health Literacy Berbasis Website dan Booklet terhadap Penanda Sindrom Metabolik pada Aparatur Sipil Negara: Studi Kuasi-Eksperimen	Universitas Negeri Makassar
2	Ns. Purhadi S.Kep., M.Kep	Connection Perceptions of Vulnerability and Severity of Modern and Healthy Circumcision Behaviors from the Perspective of the Health Belief Model	Universitas An Nuur
3	Dr. Zainudin, S.Kep., M.Kep	Tech-enabled interactive health coaching on self-management motivation in type 2 diabetes mellitus: A quasi-experimental study	Universitas Negeri Gorontalo
4	Ns. Yusrah Taqiyah, S.Kep., M.Kes., M.Kep	Effectiveness Of Effleurage Massage On Pain Adaptation Active Phase Of First Stage Labor	Universitas Muslim Indonesia
5	St. Munawwarah. M.S.Kep.,Ns.,M.Kep		Institut Ilmu Kesehatan Pelamonia Makassar
6	Dr.Musaidah.,S.Kep.,Ns.,S.KM.,M.Kes	The Role Of Telehealth In Improving Follow-Up Visit Adherence Among Patients With Hypertension	STIKES GUNUNG SARI
7	Ns. Nurun Salaman Alhidayat, S.Kep., M.Kep., Sp.Kep.MB.	Murottal Al-Quran Audio Therapy Combined with Ambient Nature Sounds Improves Sleep Quality in Hospitalized Stroke Patients: A Pre-Experimental Study	Institut Ilmu Kesehatan Pelamonia
8	Rahmawati Ramli.S.Kep.Ns.M.Kes.M.Kep	The Effect of Caregiver Psychoeducation on Stress and Family Adaptation of Elderly Dementia Caregivers	Universitas Muslim Indonesia
9	Ns. Hijrah S.Kep., M.Kes	Family Roles and Knowledge as Determinants of Healthy Lifestyle Practices among Patients with Hypertension in Primary Health Care	Institut Ilmu Kesehatan Pelamonia
10	Hj. Afriyana Amelia Nuryadin, SKM., M.Kes	The Effect Of Work Engagement, Work Motivation, And Job Satisfaction On Turnover	Institut Ilmu Kesehatan Pelamonia



		Intention With Organizational Commitment As An Intervening Variable On Nurses At Grestelina Hospital Makassar	
11	Sri Yulian H.S.Kep.,Ns.,M.Kep	The Effect Of Pmr Therapy On Pain Levels In Elderly Individuals With Rheumatoid Arthritis (Ra)	Universitas Negeri Gorontalo
12	Sri Ayu Rahayu Paneo	The Relationship Between Health Literacy and Quality of Life Among Older Adults with Hypertension at Bontomarannu Community Health Center, South Sulawesi	Institut Ilmu Kesehatan Pelamonia
13	Normalia,S.Kep.Ns.M.kep	Effectiveness Of Diaphragmatic Breathing Relaxation Therapy In Reducing Pain Levels Among Patients With Stroke: A Quasi-Experimental Study	Sekolah Tinggi Ilmu Kesehtan Gunung Sari
14	Dr.Andi yaumil Bay R Thaifur, SKM.,M.Kes	The Influence of Quality of Work Life and Work Motivation on Job Satisfaction of Nurses in the Inpatient Installation at RSUP. Tadjuddin Chalid Makassar	Institut Ilmu Kesehatan Pelamonia
15	Sri Wahyuni Bahrum,S.ST., Bdn.,M.Keb	Effectiveness of P6 (Nei Guan) Acupressure Therapy as a Socio-Culturally Based Complementary Approach to Nausea and Vomiting in First-Trimester Pregnant Women in the Working Area of Kassi-Kassi Public Health Center, Makassar City	Stikes Gunung Sari
16	Bdn. Sehmawati,S.Sit., M.Keb	The Relationship Between Knowledge And Attitude Of Pregnant Women Towards The Inaccuracy Of Integrated Antenatal Care Visits At Gabus 2 Public Health Center	Universitas An Nuur
17	Anisatul Afidah	The Effect Of A Pregnancy Education Chatbot On The Anxiety Level Of Pregnant Women With Emesis Gravidarum At Purwodadi 1 Public Health Center	Universitas An Nuur
18	Wulan Yuniana Putri	Efektivitas Pemberian Pudding Kacang Hijau Terhadap Status Gizi Balita Usia 24-59 Bulan Di Desa Pojok Wilayah Kerja Puskesmas Tawangharjo	Universitas An Nuur



19	Pintam Ayu Yastirin S.ST., M.Kes	Tea Consumption Habits And Dietary Patterns As Risk Factors For Anemia Among Adolescent Girls: A Cross-Sectional Study	Universitas An Nuur
20	Bdn. Rosmala Kurnia Dewi, S.ST., M.Kes	The Relationship Of Hb Levels And Nutritional Status Of Pregnant Women To The Incident Of Lbw At The Tawangharjo Health Center In 2025	Universitas An Nuur
21	Dr. Festy Mahanani, S.Keb., MPH	Blended Learning-Based Early Detection Strategy to Reduce Maternal, Infant Mortality, and Stunting in Central Java	UIN Yogyakarta
22	Dr. Mingle A Pistanty, M.Pd	Spectroscopic Characterization and Chemotaxonomy of Volatile Compounds from Lowland Papuan Gogauke (Centella asiatica L. Urban) Extract as an Eco-Friendly Bio-Excellent Product	Universitas Negeri Cenderawasih
23	Apt. Gigih Kenanga Sari, S.Farm., M.Farm	Effect of Solvent Polarity on Total Flavonoid Content of Ocimum basilicum Leaf Extracts Measured at 415 nm Using UV-Vis Spectrophotometry	Universitas An Nuur
24	Rahmaniah	Development Of Chitosan Adsorbent From Red Kurisi Fish Scales (Nemipterus Virgatus)-TiO ₂ For Lead (Pb) Adsorption In Leachate From Batu Terang Landfill, Bantaeng Regency	UIN Alauddin Makassar
25	Kurnia Ramadani Karim, S.Si.M. Pd	Green-Synthesis and Characterization of Copper Nanoparticles Using Basil (Ocimum sanctum Linn) Leaf Extract as a Sustainable Bioreductant	Universitas Islam Negeri Alauddin Makassar
26	Aruma Dini Asiandaru	Qualitative And Quantitative Analysis Of Sibutramine HCl Levels In Herbal Slimming Drugs In Grobogan Regency	Universitas An Nuur
27	Dhiva Mariska	Analysis of Rhodamine B Levels in Lip Tint Products Circulating in Tawangharjo District	Universitas An Nuur
28	Risky Eka Saputra	TRANSDERMAL PATCH FORMULATION OF ETHANOL EXTRACT OF	Universitas An Nuur



		PANDAN WANGI LEAVES (Pandanus amaryllifolius Roxb.) WITH HPMC BASE RATIOS	
29	Dra.Wahyu Rochana, MBA,MM.	Digital Transformation and Sales Performance Improvement of Sambelono Eatery: Evidence from a Culinary SME in Sidoarjo, Indonesia	Universitas Teknologi Surabaya
30	Suriyah Satar, M.Pd	Bringing Biology to Life: Developing Canva-Assisted Animated Comics for Human System Learning	Universitas Cenderawasih
31	Wahyu Setyowati	Grobogan Kultura: An Integrated Digital Platform For the Advancement of Cultural Tourism and Local MSMEs	Universitas An Nuur
32	Zanuba Isna Aulia	Implementation of Accounting Information System (AIS) in HUMAN RESOURCE MANAGEMENT (HRM) & Payroll Cycle of a Culinary MSME: A Case Study of Yoland's Kitchen, Grobogan Regency, Central Java	Universitas An Nuur
33	Leon Mitra Harju, SE., MM	Analysis of the Disparity Between Regulation and Reality: Evaluating the Impact of the Free Nutritious Meal (MBG) Program on the Income and Profit Margins of Traditional Market Traders in Arso District, Keerom Regency, Papua	Universitas Negeri Cenderawasih
34	Satria Avianda Nurcahyo, S.E., S.Hum.,M.M	Beyond Human Resource Practices: A Resource-Based View of Strategic Human Resource Management and Organizational Performance in Islamic Banking	Universitas Ngudi Waluyo
35	Adrian Surya Ibka Putra	Tallentboost Games Developing A Gamified Career Redefinition Assessment Platform As An Innovative Strategy In Improving High School And University Students' Work Readiness Through A Smart Job Recommendation System	Universitas An Nuur
36	Muhammad Hilal	Empowering Farmer Communities Through Corn Cob Waste-Based Bionest Fiber Innovation For	Universitas An Nuur



		Sustainable Chili Cultivation And Rural Economic Growth	
37	Ana Widyaningsih	Transforming Waste into Value: A Community-Based Circular Economy Empowerment Model in Grobogan Regency	Universitas An Nuur
38	Dr.Ir.A.Muhammad Syafar.,A.Md.,S.T.,M.T.,IPM	Integrating the SAVAR Framework and Metaverse Technologies to Optimize Educational Media Practicality	UIN Alauddin Makassar
39	Iqbal Sabilirasyad, S.ST., M.Tr.Kom	Mapping Indonesian Hoax Narratives Across Sentiment, Topics, Time, Entities, and Language Patterns	<u>Institut Teknologi dan Sains Mandala</u>
40	Nurul Fuadi, S.Si., M.Si	Carbon Dots (CDs) Based on Kluwak Shells (Pangium Edule) Using a Microwave-Assisted Technique for Detection of Heavy Metal Lead (Pb)	Universitas Islam Negeri Alauddin Makassar
41	Kartika Imam Santoso, S.E., S.Kom.,M.Kom	Random Forest-Xgboost Stacking Ensemble For Toxic Comment Detection On Roblox	Universitas An Nuur
42	Dhika Malita Puspita Arum, S.Kom., M.Kom	Comparative Analysis of Machine Learning Algorithm with Oversampling Technique for Maternal Health Risk Classification	Universitas An Nuur
43	Andri Tryono S.T., M.T	Limitations and Advances of Association Rule Mining and FP-Growth Algorithms for Time-Variant Transaction Data in the Food & Beverage Industry	Universitas An Nuur
44	Erika Dwi Saputra		Universitas An Nuur
45	Rahmatul khasanah. S. Pd., M. Pd	English As A Gateway To Global Markets: A Qualitative Study Of Vanilla Buyer Outreach	Sekolah Tinggi Ilmu Bahasa dan Sastra (STIBA) Satya Widya
46	Etika Dewi Kusumaningtyas, M.Pd	Student Engagement in Blended Learning Environments: A Systematic Review of Effective Design Strategies and Pedagogical Implications	Universitas An Nuur
47	Roisa Nur Wakhidah	The Benefit of Artificial Intelligence (AI) In English Language Teaching	Universitas An Nuur
48	Dian Oktaviani	The Transformation of Pedagogical Competence from	Universitas An Nuur



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AICHEBEST

		the Digital Era to the AI Era	
49	Khoirotun Nisa	A Systematic Review: The Impact Of Digital Proficiency On Teacher Professional Development	Universitas An Nuur
50	Putri Isna Fatmawat	A Systemic Review on the Role of AI in TPACK's Implementation	Universitas An Nuur
51	Ns. Evi Kusmayanti, S. Kep., M. Kep	Measuring Social Skills in School-Age Children: A Scoping Review of Existing Assessment Instruments	Institut Ilmu Kesehatan Pelamonia Makassar
52	Sri Zelviani, S.Si., M.Sc	Analisis Sintesis Komposit Lidah Buaya (Aloe Vera) Dan Timbal (Ii) Asetat (Pb(Ch3coo)2) Sebagai Kandidat Material Apron	UIN Alauddin Makassar



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EFFECTIVENESS OF A WEBSITE AND BOOKLET-BASED HEALTH LITERACY MODEL ON METABOLIC SYNDROME MARKERS AMONG CIVIL SERVANTS: A QUASI-EXPERIMENTAL STUDY

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Metabolic syndrome increases the risk of cardiovascular disease and type 2 diabetes mellitus. Civil servants are at risk of metabolic syndrome due to sedentary work patterns, unbalanced dietary intake, and low physical activity. Health literacy interventions through appropriate educational media can improve knowledge, motivation, and preventive behavior. This study aimed to analyze differences in metabolic syndrome markers, including waist circumference, systolic blood pressure, diastolic blood pressure, total cholesterol, and fasting blood glucose after a health literacy intervention using a website and booklet. This study used a quasi-experimental design with a pretest-posttest control group. The intervention was conducted for 4 weeks. The intervention group received education through an interactive website and monitoring via a WhatsApp group, while the control group received education through a booklet. Data were analyzed using the Independent Sample t-test, Mann Whitney test, Paired Sample t-test, and Wilcoxon test. The results showed that waist circumference in the intervention group increased by 0.90 cm, but the change was not significant ($p=0.249$). In the control group, waist circumference increased significantly by 3.38 cm ($p=0.000$), although the difference between groups was not significant ($p=0.362$). Systolic and diastolic blood pressure did not change significantly in either group ($p>0.05$). Total cholesterol decreased by 4.13 mg/dL in the intervention group ($p=0.460$), while it increased by 5.44 mg/dL in the control group ($p=0.203$), with no significant difference between groups ($p=0.123$). Fasting blood glucose decreased by 0.40 mg/dL in the intervention group ($p=0.082$), while it increased significantly by 12.50 mg/dL in the control group ($p=0.000$). The difference between groups was significant ($p=0.001$). The website and booklet-based health literacy intervention was effective in preventing an increase in fasting blood glucose and slowing the increase in waist circumference among civil servants. This integrated educational media has potential as a promotive and preventive strategy in the workplace.

Keywords: metabolic syndrome, health literacy, website, booklet, employees.



THE RELATIONSHIP BETWEEN PERCEIVED VULNERABILITY AND SEVERITY OF MODERN AND HEALTHY CIRCUMCISION BEHAVIORS FROM A HEALTH BELIEF MODEL PERSPECTIVE

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Background: Circumcision is a medical procedure performed for health, religious, or cultural reasons. In public health, modern circumcision performed by healthcare professionals using sterile procedures is considered safer and can provide health benefits. Modern and healthy circumcision practices have not been optimally utilized by the public. The behavioral decision to undergo modern and healthy circumcision is influenced by various psychological, social, and cultural factors. The Health Belief Model (HBM) is a frequently used approach to explaining health behavior. This model explains that a person's health behavior is influenced by the individual's perception of disease risk (perceived susceptibility) and disease severity (perceived severity). **Objective:** The purpose of this study was to determine the relationship between perceived susceptibility and severity and modern and healthy circumcision behavior from the perspective of the Health Belief Model. **Method:** This study was a correlational analysis with a cross-sectional approach, which examines the dynamics of the correlation between risk factors and effects through a collaborative approach, observation, or data collection. **Results:** The study obtained a p-value of $0.048 < \alpha$ (0.05), thus concluding that there is a relationship between perceived susceptibility and modern and healthy circumcision behavior. The study obtained a p-value of $0.009 < \alpha$ (0.05), thus concluding that there is a relationship between perceived severity and modern and healthy circumcision behavior. **Conclusion:** There is a relationship between perceived vulnerability and modern and healthy circumcision behavior. There is a relationship between perceived severity and modern and healthy circumcision behavior.

Keywords: Vulnerability, severity, behavior, circumcision

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TECH-ENABLED INTERACTIVE HEALTH COACHING ON SELF-MANAGEMENT MOTIVATION IN TYPE 2 DIABETES MELLITUS: A QUASI-EXPERIMENTAL STUDY

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Type 2 diabetes mellitus (T2DM) is a growing global health burden, including Indonesia, with significant impacts on morbidity, mortality, and quality of life. Effective self-management is essential but often hindered by low motivation and self-efficacy. This study aimed to evaluate the effectiveness of tech-enabled interactive health coaching (TIHC) delivered via the Sweetech-DM application in improving self-management motivation, self-efficacy, and quality of life among patients with T2DM. This quasi-experimental study involved 80 patients with T2DM (40 in the intervention group and 40 in the control group). The intervention consisted of a TIHC program delivered through the Sweetech-DM application. The control group received standard education provided by community health facilities. Data were collected using the treatment self-regulation questionnaire (TSRQ), diabetes management self-efficacy scale (DMSES), and world health organization quality of life scale (WHOQOL-BREF). Data were analyzed using chi-square tests, paired-sample t-tests, independent-sample t-tests, and ANCOVA. The findings revealed significantly greater improvements in self-management motivation, quality of life, and self-efficacy in the intervention group compared to the control group (p value <.0001). There were significant post-intervention differences between the intervention and control groups across all measured variables (p value <.0001). The results indicate that application-based TIHC is effective in enhancing self-management motivation, self-efficacy, and quality of life among patients with T2DM. These findings highlight the potential of TIHC as an innovative educational strategy for primary healthcare settings.

Keywords: Type 2 diabetes mellitus, self-management, motivation, health coaching, peer support



EFFECTIVENESS OF EFFLEURAGE MASSAGE ON PAIN ADAPTATION ACTIVE PHASE OF FIRST STAGE LABOR

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Labor pain is experience physiological that is almost always experienced Mother giving birth , especially during the first phase active . Experience This caused by uterine contractions and dilation cervix . One of the non- pharmacological methods For reduce painful labor is effleurage massage. Research This aim For know effectiveness of effleurage massage on adaptation pain during the first phase of labor active Study This apply design pre experiment with one-group pretest- posttest design . The sample consists of 52 respondents , namely Mother giving birth in the first phase active that meets criteria inclusion and exclusion . Instruments measurement is sheet Numeric Rating Scale (NRS) observation for evaluate level painful before and after intervention Effleurage massage . Data analysis used the Shapiro-Wilk normality test , followed by the Wilcoxon Signed Rank Test. Research result This show that before intervention effleurage massage , part Mother giving birth experience painful heavy with average value of 7.04. After intervention , value the decrease to 5.23, so that happen average decline average of 1.81 points . The Wilcoxon test produced Z value = -6.316 with $p = 0.000$ ($p < 0.05$). Findings This indicates existence effectiveness significant effleurage massage against adaptation pain in the first stage of labor active . Research conclusion This state that technique effective effleurage massage lower intensity painful labor in the first phase active . Therefore that , power health recommended For apply technique the as non- pharmacological interventions in management painful childbirth . In addition , education about technique This need given to Mother giving birth as preparation facing the labor process .

Keywords : Effleurage Massage; Labor Pain ; Active Phase I ; Mother in Labor ; Adaptation



THE ROLE OF TELEHEALTH IN IMPROVING FOLLOW-UP VISIT ADHERENCE AMONG PATIENTS WITH HYPERTENSION

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Background: Hypertension remains a major public health challenge worldwide and is a leading risk factor for cardiovascular disease, stroke, and premature mortality. Effective hypertension management requires regular follow-up visits to monitor blood pressure and treatment outcomes. However, poor adherence to scheduled follow-up visits continues to hinder optimal disease control. Telehealth has emerged as a promising strategy to improve healthcare accessibility, patient engagement, and continuity of care, particularly for individuals with chronic diseases.

Objective: This study aimed to examine the role of telehealth in improving follow-up visit adherence among patients with hypertension. **Methods:** A quasi-experimental study employing a two-group post-test design was conducted among 40 hypertensive patients recruited from a primary healthcare setting. Participants were assigned to either an intervention group (n = 20) or a control group (n = 20). The intervention group received telehealth-based services, including remote health education, follow-up monitoring, and appointment reminders, while the control group received standard care. Follow-up visit adherence was assessed using a validated adherence questionnaire and attendance records. Data were analyzed using an independent t-test with a significance level of $p < 0.05$.

Results: The findings demonstrated a statistically significant difference in follow-up visit adherence between the intervention and control groups ($p = 0.001$). Patients who received telehealth interventions reported higher adherence scores compared with those receiving standard care, indicating improved compliance with scheduled follow-up visits.

Conclusion: Telehealth significantly improved follow-up visit adherence among patients with hypertension. The integration of telehealth into primary healthcare services may represent an effective approach to enhancing patient monitoring, health education, and continuity of care for hypertension management. Further studies with larger sample sizes and longer follow-up periods are recommended to confirm these findings and evaluate long-term clinical outcomes.

Keywords: Telehealth; Hypertension; Follow-up Visit adherence



MUROTTAL AL-QUR'AN AUDIO THERAPY COMBINED WITH AMBIENT NATURE SOUNDS IMPROVES SLEEP QUALITY IN HOSPITALIZED STROKE PATIENTS: A PRE-EXPERIMENTAL STUDY

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Introduction: Stroke is a leading cause of death and long-term disability worldwide, with post-stroke sleep disturbance independently impairing neurological recovery and rehabilitation outcomes. Despite its clinical significance, non-pharmacological sleep interventions for stroke inpatients remain insufficiently studied, particularly in Muslim-majority healthcare settings. **Objective:** This study aimed to determine the effect of Murottal Al-Qur'an audio therapy combined with ambient nature sounds on sleep quality in hospitalized stroke patients. **Method:** A pre-experimental one-group pretest-posttest design was employed with 37 stroke inpatients recruited through purposive sampling at a tertiary neurological referral center in Makassar, Indonesia. The intervention consisted of Murottal Al-Qur'an recitation combined with ambient nature sounds delivered for 10 to 15 minutes per session over three consecutive days. Sleep quality was measured using the validated Indonesian-language Pittsburgh Sleep Quality Index, and data were analyzed using the Wilcoxon signed-rank test ($p < 0.05$). **Result:** Prior to the intervention, all 37 respondents (100%) exhibited poor sleep quality with a mean Pittsburgh Sleep Quality Index score of 8.49. Following the intervention, 86.5% achieved good sleep quality, with mean scores declining to 4.57 — a clinically meaningful reduction of 3.92 points exceeding the recognized minimally important difference threshold. The Wilcoxon signed-rank test confirmed this improvement as statistically significant ($p = 0.000$). **Conclusion:** Murottal Al-Qur'an therapy combined with ambient nature sounds significantly improves sleep quality in hospitalized stroke patients. Its passive delivery, absence of adverse effects, cultural congruence, and minimal resource requirements position it as a promising complementary nursing intervention in stroke rehabilitation. RCTs with objective sleep measurement are warranted to confirm these findings.

Keywords: Murottal Al-Qur'an therapy; stroke; sleep quality; Pittsburgh Sleep Quality Index; complementary nursing intervention; non-pharmacological therapy; post-stroke rehabilitation



THE EFFECT OF CAREGIVER PSYCHOEDUCATION ON STRESS AND FAMILY ADAPTATION OF ELDERLY DEMENTIA CAREGIVERS

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Introduction: elderly people experience physical and cognitive changes as they age which can greatly affect their quality of life. Seniors face a variety of challenges as they age, including physical, psychological, and cognitive problems such as dementia. Caregivers with dementia often experience stress and this can result in negative physical and psychological consequences for the caregiver, a phenomenon known as caregiver burden. High levels of stress can have a negative impact on the caregiver's physical and psychological health, as well as reduce the quality of care provided to the elderly. Psychoeducation is an approach designed to provide knowledge, skills and emotional support to caregivers. The aim of this research is to determine the effect of psychoeducation on the stress of elderly people with dementia. **Method:** quasi-experimental research type with a Non Equivalent Control Group Pretest and Posttest Design. The research population was family caregivers with a total sample of 66 and taken using consecutive sampling technique. The intervention in this study was psychoeducational interventions for caregivers and health education for the control group. The instruments used for stress are the Perceived Stress Scale (PSS-10). **Results:** there is a significant difference after providing caregiver psychoeducation intervention on the stress and adaptation of family caregivers with a p-value of $0.000 < 0.05$, meaning that there is an influence of caregiver psychoeducation on the stress and adaptation of family caregivers of elderly people with dementia. **Conclusion:** caregiver psychoeducation is effective in reducing family caregiver stress levels.

Keywords : Caregiver psychoeducation, family caregiver, dementia



FAMILY ROLES AND KNOWLEDGE AS DETERMINANTS OF HEALTHY LIFESTYLE PRACTICES AMONG PATIENTS WITH HYPERTENSION IN PRIMARY HEALTH CARE

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Hypertension remains a major public health concern due to its long-term complications and the difficulty many patients experience in maintaining consistent lifestyle modification. Although pharmacological treatment is essential, effective hypertension control also depends on patients' knowledge and the supportive role of families in daily self-care practices. This study aimed to examine the association between family roles, patient knowledge, and healthy lifestyle practices among patients with hypertension in the working area of Barombong Public Health Center, Makassar, Indonesia. A quantitative analytic study with a cross-sectional design was conducted in January 2026. The study population consisted of 222 patients with hypertension, from which 157 respondents were selected using the Slovin formula and non-probability sampling based on predetermined inclusion and exclusion criteria. Data were collected using structured questionnaires assessing family roles, knowledge, and healthy lifestyle practices. The data were analyzed using univariate analysis and the Chi-Square test with a significance level of 0.05. The findings showed that 63.7% of respondents had good knowledge, 52.9% reported good family roles, and 58.0% demonstrated good healthy lifestyle practices. Respondents with good knowledge were more likely to practice a healthy lifestyle than those with poor knowledge. The Chi-Square test indicated a significant association between knowledge and healthy lifestyle practices among patients with hypertension ($p = 0.007$). Similarly, respondents with good family roles showed better healthy lifestyle practices than those with poor family roles, with a statistically significant association ($p = 0.004$). These findings suggest that knowledge and family roles are important factors associated with healthy lifestyle practices in hypertension management. Strengthening family-centered education and continuous health promotion in primary health care may improve self-management behavior and support long-term blood pressure control among patients with hypertension.

Keywords : hypertension, family role, knowledge, healthy lifestyle, primary health care



THE EFFECT OF WORK ENGAGEMENT, WORK MOTIVATION, AND JOB SATISFACTION ON TURNOVER INTENTION WITH ORGANIZATIONAL COMMITMENT AS AN INTERVENING VARIABLE ON NURSES AT GRESTELINA HOSPITAL MAKASSAR

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Background: Turnover intention in nurses is an important strategic challenge for hospitals because it has an impact on increasing recruitment and training costs, reducing productivity, disrupting service continuity, and having an effect on patient quality and safety. In line with the regulations of the Ministry of Health and Law No. 44 of 2009 concerning Hospitals which emphasize the importance of providing competent and sustainable health workers, which are required to be able to retain quality nursing staff. Based on previous research, it shows that turnover intention is influenced by psychological and organizational factors, nurses with high engagement, motivation, and job satisfaction tend to have a strong organizational commitment so that the desire to leave the organization is lower. **Objective** this study is to analyze the effect of work engagement, work motivation, and job satisfaction on turnover intention with organizational commitment as an intervening variable. **Method**, this study uses a quantitative approach with a cross-sectional study design by distributing questionnaires to all nurses at Grestelina Hospital Makassar as many as 152 nurses, and analyzed using SEM-PLS. **Results and Conclusions**, the study shows that there is a positive influence on the variables of work engagement, work motivation, and job satisfaction on turnover intention, both directly and indirectly through organizational commitment as an intervening variable with a P-value <0.05. **Suggestions**, so that hospitals can improve work engagement, work motivation, and job satisfaction of nurses, through organizational commitment to develop a supportive work environment, provide work motivation, and increase job satisfaction to suppress turnover intention in a sustainable manner.

Keywords : Turnover Intention, Work Engagement, Work Motivation, Job Satisfaction, Organizational Commitment



THE EFFECT OF PMR THERAPY ON PAIN LEVELS IN ELDERLY INDIVIDUALS WITH RHEUMATOID ARTHRITIS (RA)

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Pain is a common complaint among elderly individuals with Rheumatoid Arthritis (RA) due to joint inflammation, which can disrupt daily activities. One non-pharmacological therapy that can be used to help reduce pain levels is Progressive Muscle Relaxation (PMR) therapy. This study aims to determine the effect of PMR therapy on pain levels in elderly individuals with RA. This research employed a pre-experimental design with a one-group pretest-posttest approach. The variables in this study consisted of the independent variable, Progressive Muscle Relaxation therapy, and the dependent variable, pain levels in elderly individuals with RA. The sampling technique used was purposive sampling, with a total sample of 31 respondents. The research instruments were observation sheets and the Numeric Rating Scale (NRS) for pain measurement, and data analysis was performed using the Wilcoxon Signed Rank Test at the 5% significance level. The results showed that before receiving PMR therapy, the majority of respondents 24 (77, 4%) experienced moderate pain, and 7 respondents (22.6%) experienced severe pain. After receiving PMR therapy, pain levels decreased, with the majority of respondents falling into the moderate pain category 18 respondents (58.1%) and the mild pain category 13 respondents (41.9%). The bivariate analysis results showed a p-value of 0.000 (<0.05), indicating a significant effect of PMR therapy on pain levels in elderly individuals with RA. This study concludes that Progressive Muscle Relaxation therapy is effective as a non-pharmacological intervention for reducing pain levels in elderly individuals with RA at Puskesmas Kota Selatan

Keywords: Elderly, Progressive Muscle Relaxation, Rheumatoid Arthritis, Pain Level



**THE RELATIONSHIP BETWEEN *HEALTH LITERACY* AND QUALITY OF LIFE
AMONG OLDER ADULTS WITH HYPERTENSION AT BONTOMARANNU
COMMUNITY HEALTH CENTER, SOUTH SULAWESI**

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Background: Hypertension is a chronic condition commonly experienced by older adults and can affect their quality of life. Globally, the prevalence of hypertension is estimated to affect approximately 1.28 billion adults worldwide. In Indonesia, according to data from the 2018 Risesdas survey, the prevalence of hypertension reached 34.1% among the population aged 18 years and older. The high prevalence of hypertension indicates that this condition is a serious health issue, particularly among the elderly. The elderly's ability to understand health information (*health literacy*) plays a crucial role in disease management, treatment adherence, and the prevention of complications. Low *health literacy* can lead to poor blood pressure control and a decline in the quality of life for the elderly. **Objective:** To determine the relationship between *health literacy* and quality of life among the elderly with hypertension. **Methods:** This study employed a quantitative approach with a *cross-sectional* design. The sample consisted of 85 older adults with hypertension selected using total *sampling*. Data collection was conducted using a *health literacy* questionnaire that had been validated for validity and reliability, as well as the WHOQOL-BREF questionnaire to measure quality of life. Data analysis was performed using the Kruskal-Wallis test. **Results:** The results showed that the majority of respondents had a *health literacy* level in the *problematic* category. Bivariate analysis indicated a significant association between *health literacy* and quality of life in older adults with hypertension ($p < 0.05$). **Conclusion:** There is a significant association between *health literacy* and quality of life in older adults with hypertension. The higher the level of *health literacy*, the better the quality of life for older adults.

Keywords: *Health Literacy*, Quality of Life, Older Adults, Hypertension



EFFECTIVENESS OF DIAPHRAGMATIC BREATHING RELAXATION THERAPY IN REDUCING PAIN LEVELS AMONG PATIENTS WITH STROKE: A QUASI- EXPERIMENTAL STUDY

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Background: Stroke is one of the leading non-communicable diseases and a major cause of mortality and disability worldwide. In addition to neurological impairments, stroke patients frequently experience pain, which can hinder the rehabilitation process, reduce quality of life, and delay recovery. Non-pharmacological interventions such as diaphragmatic breathing therapy have been developed as complementary approaches to reduce pain perception through relaxation mechanisms and improved body oxygenation. **Objective:** This study aimed to analyze the effect of diaphragmatic breathing therapy on changes in pain levels among stroke patients at Dadi Regional Special Hospital, South Sulawesi Province. **Methods:** This study employed a quasi-experimental design using a one-group pretest–posttest approach. The study was conducted from January to February 2026 and involved 71 stroke patients selected through purposive sampling. The intervention consisted of diaphragmatic breathing therapy administered according to a standardized operating procedure. Pain levels were measured before and after the intervention using an observation sheet. Data analysis was performed to assess differences in pain levels before and after the therapy. **Results:** The results showed that diaphragmatic breathing therapy had a significant effect on reducing pain levels among stroke patients. Statistical analysis revealed a significant difference between pain levels before and after the intervention, with a p-value of 0.001 ($p < 0.05$). **Conclusion:** Diaphragmatic breathing therapy is effective in reducing pain levels among stroke patients. This intervention can be recommended as a simple, safe, and easily applicable non-pharmacological nursing strategy to support pain management in stroke patients.

Keywords: Stroke, diaphragmatic breathing, pain, non-pharmacological therapy, pain management.



MEASURING SOCIAL SKILLS IN SCHOOL-AGE CHILDREN: A SCOPING REVIEW OF EXISTING ASSESSMENT INSTRUMENTS

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Background: Social skills are critical for school-aged children, influencing academic success, emotional well-being, and social functioning. However, many face persistent challenges in social interaction across educational and community settings. Valid and reliable instruments are essential for accurate assessment.

Methods: A scoping review was conducted following PRISMA and the PCC (Population, Concept, Context) framework. Five databases—PubMed, ScienceDirect, Google Scholar, Oxford Academic, and SAGE Journals—were searched for studies published from 2012 to 2022. Ten eligible articles were appraised using the Joanna Briggs Institute (JBI) checklist.

Findings: Ten studies identified seven instruments: SSS, SSRS, SSIS, SSQ, CSSQ, SSBS, and HCSBS. These instruments varied in conceptual basis, domains measured, respondent types, and psychometric quality.

Conclusion and Recommendations: Instrument selection should consider cultural-contextual relevance, psychometric rigor, and application setting. This review provides a foundation for adapting and validating social skills measures in nursing, educational, and community-based practices.

Keywords: School-aged children; Social skills; Measurement instrument; Validity; Reliability



THE RELATIONSHIP OF HB LEVELS AND NUTRITIONAL STATUS OF PREGNANT WOMEN TO THE INCIDENT OF LBW AT THE TAWANGHARJO HEALTH CENTER IN 2025

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Background: LBW is the condition of a baby with a birth weight of less than 2500 grams. The causes of LBW include maternal factors during pregnancy, for example maternal age, maternal nutrition, and socio-economic conditions. Pregnancy factors include pregnancy with hydramnios, nausea, antepartum bleeding, pregnancy complications such as preeclampsia/eclampsia, premature rupture of membranes, and fetal factors such as congenital defects and infections in the uterus. Objective: To determine the relationship between Hb levels and nutritional status of pregnant women on the incidence of LBW at the Tawangharjo Community Health Center. Methods: Quantitative research with an analytical survey design and a retrospective approach was conducted in June 2025. A total of 49 pregnant women used the Total Sampling technique. The data used is secondary data, namely LBW data from the 2024 Maternal and Child Health program report at the Tawangharjo Community Health Center, and analyzed using the Chi Square test. Results: Most of the mothers' Hb levels were normal, there were 47 respondents (95.9%), the nutritional status of the mothers was mostly normal, there were 47 respondents (95.9%), the incidence of LBW was mostly LBW, there were 47 respondents (95.9%). Chi Square analysis produces a value of $p = 0.000$ ($p < 0.05$) for both variables. Conclusion: There is a significant relationship between Hb levels and nutritional status of pregnant women and the incidence of LBW at the Tawangharjo Community Health Center. Awareness of the importance of maintaining nutritional and health status during pregnancy through a healthy lifestyle and adequate nutritional intake.

Keywords: *LBW events; Hb level; Nutritional status; Pregnant mother.*



**THE INFLUENCE OF QUALITY OF WORK LIFE AND WORK MOTIVATION ON JOB
SATISFACTION OF NURSES IN THE INPATIENT INSTALLATION AT RSUP.
TADJUDDIN CHALID MAKASSAR**

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Background: Nurse job satisfaction plays a vital role in enhancing the quality of hospital services, which is influenced by the Quality of Work Life (QWL) and work motivation. At RSUP Dr. Tadjuddin Chalid Makassar, the termination of external medical personnel assistance triggered a sudden surge in workload, human resource limitations, and inadequate work facilities. A research gap exists as most previous studies focused solely on stable hospital conditions rather than the transitional phase of fluctuating workloads post-external crisis, as observed in this phenomenon. **Objective:** To determine the influence of QWL and work motivation on the job satisfaction of nurses in the inpatient installation of RSUP Dr. Tadjuddin Chalid Makassar. **Research Method:** This quantitative study utilized a cross-sectional approach. The population and sample consisted of 151 inpatient nurses selected via total sampling. Data were collected using valid and reliable questionnaires, then analyzed using univariate, bivariate (chi-square), and multivariate (multiple linear regression) analysis via SPSS. **Results and Conclusion:** The results showed a partial influence of QWL on job satisfaction ($p = 0.000$) and work motivation on job satisfaction ($p = 0.000$). Simultaneously, QWL and motivation significantly influenced nurse job satisfaction ($p = 0.021$). The novelty of this research proves that despite being under extreme workload pressure with a low capacity to voice grievances, nurses maintained a high sense of job pride and security. The better the QWL and motivation conditioned during this transitional period, the higher the nurse job satisfaction. **Suggestion:** Hospital management is advised to utilize these unique behavioral findings to design human resource management strategies, retention policies, conducive environments, and fair reward systems post-workload crisis in government referral hospitals.

Keywords: Quality of Work Life, Work Motivation, Nurse, Job Satisfaction, Hospital, Inpatient.



THE RELATIONSHIP BETWEEN KNOWLEDGE AND ATTITUDE OF PREGNANT WOMEN TOWARDS THE INACCURACY OF INTEGRATED ANTENATAL CARE VISITS AT GABUS 2 PUBLIC HEALTH CENTER IN 2024

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Background: Pregnancy is a natural physiological process that requires proper monitoring throughout its course. Inadequate supervision during pregnancy can lead to complications in the antepartum, intrapartum, and postpartum periods, including maternal and neonatal mortality. Integrated Antenatal Care (ANC) based on the 10T standard is a critical public health strategy to reduce maternal and infant mortality rates. **Objective:** To determine the relationship between knowledge and attitude of pregnant women towards the inaccuracy of integrated ANC visits at Gabus 2 Public Health Center in 2024. **Methods:** A quantitative study with a cross-sectional analytical survey design was conducted in August 2025. A total of 45 first-trimester pregnant women were selected using accidental sampling based on the Slovin formula. Data were collected via validated knowledge and attitude questionnaires and maternal health records (KIA books), and analyzed using the Chi Square test. **Results:** The majority of respondents had poor knowledge (37.8%) and moderately positive attitudes (35.6%). A total of 62.2% of respondents had untimely integrated ANC visits. Chi Square analysis yielded p value = 0.000 ($p < 0.05$) for both variables. **Conclusion:** There is a statistically significant relationship between knowledge and attitude of pregnant women and the inaccuracy of integrated ANC visits at Gabus 2 Public Health Center in 2024. Healthcare providers are encouraged to strengthen ANC education programs and family support to promote timely antenatal visits.

Keywords: *Integrated Antenatal Care; Knowledge; Attitude; Visit Timeliness*



THE EFFECT OF A PREGNANCY EDUCATION CHATBOT ON THE ANXIETY LEVEL OF PREGNANT WOMEN WITH EMESIS GRAVIDARUM AT PURWODADI 1 PUBLIC HEALTH CENTER

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Background; Emesis gravidarum is a physiological complaint that often triggers anxiety in first-trimester pregnant women due to the lack of accurate information regarding bodily changes during pregnancy. **Objective;** This study aimed to evaluate the impact of a pregnancy education chatbot on the anxiety levels of pregnant women experiencing emesis gravidarum at Purwodadi I Public Health Center. **Methodology;** This research used a pre-experimental design with a one-group pretest-posttest approach. The study population included all first-trimester pregnant women experiencing emesis gravidarum with 36 respondents selected through random sampling. . The intervention involved the use of a pregnancy education chatbot for 10 days. Anxiety levels were measured using the Hamilton Anxiety Rating Scale (HARS). **Result;** Before the intervention, most respondents experienced moderate anxiety (83.3%), and after the intervention, all respondents (100%) experienced a decrease in anxiety levels. Data analysis using the Wilcoxon Test showed a significance value of $p\text{-value} = 0.000 (< 0.05)$. **Conclusion;** the use of pregnancy education chatbot significantly reduces anxiety levels in pregnant women with emesis gravidarum. This AI based digital tool serves as an effective, independent, non pharmacological intervention to assist mothers in managing anxiety throughout their pregnancy.

Keyword; Educational Chatbot, Anxiety, Pregnant Women, Emesis Gravidarum.



THE EFFECTIVENESS OF MUNG BEAN PUDDING SUPPLEMENTATION ON THE NUTRITIONAL STATUS OF CHILDREN AGED 24–59 MONTHS IN POJOK VILLAGE, TAWANGHARJO COMMUNITY HEALTH CENTER WORKING AREA

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The toddler period (0-5 years) is a golden period that determines a child's growth and development. In Indonesia, toddlers face three nutritional challenges: malnutrition, stunting, and overnutrition. Although the malnutrition rate in Grobogan Regency has been suppressed to 3.26%, the Tawangharjo Community Health Center (Puskesmas) experienced a surge in all nutritional indicators from 2023 to 2025. Stunting increased from 8.34% to 20.14%, underweight from 5.76% to 21.64%, and wasting from 7.14% to 12.42%. In Pojok Village, 65 cases of underweight were reported in 2025. Nutritional improvements can be achieved by utilizing local foods as PMT (Food and Nutritional Supplements). One example is mung beans, which are high in protein and can increase toddler weight. This study aims to analyze the effectiveness of mung bean pudding on the nutritional status of toddlers aged 24-59 months in Pojok Village, and to provide the benefits of local food-based innovations for high-nutrition snacks for toddlers. The study used a pretest-posttest control group design with a quasi-experimental design. The population of 223 toddlers aged 24-59 months was stratified, with a sample size of 66 (33 intervention, 33 control). The study was conducted over 12 days in April 2026. Data normality tests showed that the data were not normally distributed ($p < 0.05$), therefore, the Wilcoxon and Mann-Whitney tests were used. Nutritional status improved significantly in both the intervention ($p = 0.003$) and control ($p = 0.025$) groups. There was a significant difference between the two groups ($p = 0.024$) with a large effect size ($r \geq 0.50$), indicating that mung bean pudding was more effective than PMT. Mung bean pudding was proven to be superior and more effective than PMT in improving the nutritional status of toddlers and is therefore recommended as a more effective alternative nutritional intervention.

Keywords: Toddlers aged 24-59, Mung Bean Pudding, Nutritional Status.



TEA CONSUMPTION HABITS AND DIETARY PATTERNS AS RISK FACTORS FOR ANEMIA AMONG ADOLESCENT GIRLS: A CROSS-SECTIONAL STUDY

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Background: The 2023 Indonesian Health Survey revealed that 54.8% of adolescent girls had never received iron supplementation, while the Grobogan District Health Office recorded 1,234 adolescents at risk for anemia in 2025. These figures are compounded by poor dietary habits including frequent breakfast skipping, inadequate food intake, and the consumption of tea or coffee during meals all of which impair iron absorption and heighten the risk of iron deficiency anemia among adolescents. Objective : to examine the association between **habitual tea consumption** and dietary patterns with the occurrence of anemia in female adolescents at SMK Negeri 1 Purwodadi. Methods : the present study utilized a **quantitative research approach** employing a **cross-sectional study design**. Participant recruitment was carried out through **purposive sampling**, resulting in a sample size of **85 respondents**. Bivariate statistical analysis was performed using the **Spearman Rank Correlation coefficient**. Result : The results of the Spearman Rank Correlation analysis demonstrated a statistically significant relationship between habitual tea consumption and anemia incidence, with a correlation coefficient of $r = 0.455$ and a significance value of $p = 0.000$ ($p < 0.05$). Additionally, dietary patterns were found to be significantly associated with anemia incidence, yielding a correlation coefficient of $r = 0.256$ and a significance value of $p = 0.000$ ($p < 0.05$). Conclusion : Both variables demonstrated a **positive correlation direction**, suggesting that deteriorating tea consumption habits and dietary patterns are associated with an increased risk of anemia among the study population.

Keyword : Tea Consumption Habits, Dietary Patterns, **Anemia, Adolescent Girls**



BLENDED LEARNING-BASED EARLY DETECTION STRATEGY TO REDUCE MATERNAL, INFANT MORTALITY, AND STUNTING IN CENTRAL JAVA

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Maternal mortality, infant mortality, and stunting remain key priorities in efforts to develop high-quality human resources in Indonesia. The health status of mothers, infants, toddlers, and school-aged children is fundamental in producing a superior generation. Midwives, as primary healthcare providers for pregnant women, play a strategic role in promotive and preventive services. One approach to strengthening these efforts is through blended learning training. This study employed a quantitative approach with a case-control design and utilized a one-group pre-posttest experimental framework. The research was conducted at the Klambu Community Health Center, where midwives received blended learning training to evaluate its impact on reducing Maternal Mortality Rate (MMR), Infant Mortality Rate (IMR), and stunting prevalence. The results showed that the Mann-Whitney statistical test for maternal mortality yielded a significance value of $p=0.241$ (>0.05), indicating that the blended learning intervention had no significant effect on reducing MMR. However, the Mann-Whitney test for infant mortality produced a value of $p=0.027$ (<0.05), demonstrating a significant effect of the intervention on reducing IMR. Additionally, the independent t-test for stunting revealed a significance value of $p=0.028$ (<0.05), indicating that the intervention significantly contributed to reducing stunting rates. In conclusion, blended learning training for midwives did not significantly affect maternal mortality rates but showed a meaningful impact on reducing infant mortality and stunting. Therefore, blended learning can be considered an effective strategy to enhance early detection and strengthen health promotion practices among midwives in efforts to reduce IMR and stunting incidence.

Keywords: Blended learning, Infant Mortality Rate, Maternal Mortality Rate, Stunting.



SPECTROSCOPIC CHARACTERIZATION AND CHEMOTAXONOMY OF VOLATILE COMPOUNDS FROM LOWLAND PAPUAN GOGAUKE (*CENTELLA ASIATICA* L. URBAN) EXTRACT AS AN ECO-FRIENDLY BIO-EXCELLENT PRODUCT

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Gogauke (*Centella asiatica* L. Urban), widely known as pegagan, is a local Papuan herbal commodity with strategic potential for development into eco-friendly, "Bio-Excellent" labeled products. The biochemical characteristics of this plant are heavily influenced by its ecoregion, where lowland environments exert specific abiotic stresses that induce the synthesis of a unique volatilome. This study was designed to comprehensively map the volatile profile of lowland Gogauke extract (grown at an altitude of 100–300 m a.s.l.) collected from the riparian zone of Lake Sentani, Papua, using Gas Chromatography-Mass Spectrometry (GC-MS) equipped with a high-resolution single quadrupole detector. Physical and microbiological evaluations demonstrated that this volatile extract maintains a stable moisture content of 9.8% with a high yield of 44.14%, while strictly complying with the microbial contamination safety limits established by BPOM (Indonesian National Agency of Drug and Food Control). Gas chromatographic separation using a semipolar TRACE TG SQC capillary column (30 m × 0.25 mm × 0.25 µm) successfully resolved 82 volatile peaks within a total separation time of 65 minutes. Mass spectra identification revealed a dominance of lupane-type pentacyclic triterpenoids, with Lupeol emerging as the primary volatile constituent, reaching a relative peak area of 10.11%. The extract was also found to be rich in functional phenolic compounds, characterized by a high accumulation of 1,2,3-Benzenetriol (8.57%) and eight fragmented peaks of the functional ester Methyl gallate (cumulative area of 8.77%). Furthermore, the analysis identified the functional lipid Squalene (4.13%), the saturated fatty acid n-Hexadecanoic acid (8.74%), dl-alpha-Tocopherol (7.10%), and phytosterols (beta-Sitosterol, Stigmasterol, and Campesterol). The combination of these compounds forms a synergistic phytocomplex system that imparts high thermal stability to the oil formulation, while simultaneously providing antioxidant, photoprotective (SPF), and dermal anti-inflammatory activities.

Keywords: Gogauke, GC-MS, Volatile, Pentacyclic Triterpenoid



EFFECT OF SOLVENT POLARITY ON TOTAL FLAVONOID CONTENT OF OCIMUM BASILICUM LEAF EXTRACTS MEASURED AT 415 NM USING UV-VIS SPECTROPHOTOMETRY

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Flavonoids are secondary metabolite compounds known for their biological activities, including antioxidant, anti-inflammatory, and antimicrobial properties. Basil leaves *Ocimum basilicum* are recognized as a potential natural source of flavonoids and antioxidants. This study aimed to analyze the total flavonoid content of basil leaf extracts using different solvents, namely 70% ethanol, ethyl acetate, and n-hexane, and to compare the effectiveness of each solvent based on polarity differences. Basil leaf simplicia were dried, powdered, and extracted by maceration for 3 × 24 hours using each solvent. The obtained extracts were subjected to phytochemical screening, Thin Layer Chromatography (TLC) analysis, and total flavonoid content determination using the AlCl_3 colorimetric method with UV-Vis spectrophotometry at 415 nm. Absorbance data were calculated using the linear regression equation of the quercetin standard curve ($y = 0.0093x + 0.015$; $R^2 = 0.998$). The results showed that the highest extract yield was obtained using 70% ethanol ($18.45 \pm 0.32\%$), followed by ethyl acetate ($6.72 \pm 0.21\%$) and n-hexane ($3.15 \pm 0.18\%$). Total flavonoid content analysis demonstrated that the 70% ethanol extract contained the highest flavonoid level at 56.82 ± 1.14 mg QE/g, followed by ethyl acetate at 34.27 ± 0.87 mg QE/g and n-hexane at 12.43 ± 0.52 mg QE/g. These findings indicate that polar solvents are more effective in extracting flavonoid compounds compared to semi-polar and non-polar solvents.

Keywords: *Ocimum basilicum*, flavonoids, solvent polarity



DEVELOPMENT OF CHITOSAN ADSORBENT FROM RED KURISI FISH SCALES (*NEMIPTERUS VIRGATUS*)–TiO₂ FOR LEAD (Pb) ADSORPTION IN LEACHATE FROM BATU TERANG LANDFILL, BANTAENG REGENCY

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Chitosan is a natural biopolymer derived from chitin through a deacetylation process and is well known for its non-toxic, biodegradable, and environmentally friendly properties. This study aimed to evaluate the effectiveness of chitosan extracted from red kurisi fish scales (*Nemipterus virgatus*) combined with TiO₂ as an adsorbent for reducing heavy metal Pb in landfill leachate from Batu Terang, Bantaeng Regency. The synthesis of chitosan was carried out through deproteinization, demineralization, and deacetylation processes, resulting in a yield of 80.44% with a degree of deacetylation of 86.12%. Characterization of the chitosan included moisture content analysis (1.5%), ash content (0.86%), and Fourier Transform Infrared Spectroscopy (FTIR), which confirmed the successful formation of chitosan through the appearance of –NH₂ and –OH functional groups. The obtained chitosan was then composited with TiO₂ at different ratios of 1:0, 1:1, and 2:1 (chitosan:TiO₂) and further confirmed using FTIR analysis. Adsorption experiments were conducted by adding 0.25 g of adsorbent into 50 mL of leachate sample. The concentration of Pb was measured using Atomic Absorption Spectroscopy (AAS) before and after treatment. The results showed that all adsorbent variations were able to reduce the initial Pb concentration of 2.1609 mg/L to below the quality standard of 0.1 mg/L as regulated by Indonesian Government Regulation No. 82 of 2001. The highest efficiency was achieved by pure chitosan (1:0 ratio) with a final Pb concentration of 0.0124 mg/L and an efficiency of 99.43%, followed by the 2:1 ratio with 70.81% and the 1:1 ratio with 52.27%. These findings indicate that chitosan derived from red kurisi fish scales is an effective and environmentally friendly adsorbent, with optimal performance observed in its pure form without TiO₂ addition. This study also highlights the potential utilization of fishery waste as a value-added material for sustainable wastewater treatment technologies. Furthermore, it contributes to the development of biomass-based adsorbent materials and offers a cost-effective, efficient, and sustainable solution for treating polluted water in broader practical applications in Indonesia.

Keywords: adsorption, leachate, chitosan, *Nemipterus virgatus*, TiO₂, Pb.



GREEN-SYNTHESIS AND CHARACTERIZATION OF COPPER NANOPARTICLES USING BASIL (*OCIMUM SANCTUM LINN*) LEAF EXTRACT AS A SUSTAINABLE BIOREDUCTANT

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Copper nanoparticles (CuNPs) have attracted significant attention due to their potential applications in health, catalysis, and functional materials. This study aimed to synthesize copper nanoparticles through an environmentally friendly green synthesis approach using aqueous basil leaf extract (*Ocimum sanctum* Linn) as a bioreductant. The biosynthesis process was carried out using five precursor-to-extract ratios, namely 1:1, 1:2, 1:3, 1:4, and 1:5. The synthesized nanoparticles were characterized using UV-Visible spectrophotometry and Scanning Electron Microscopy–Energy Dispersive X-ray Spectroscopy (SEM-EDS). The UV-Vis analysis showed that the optimum synthesis condition was obtained at a ratio of 1:4 with the highest absorbance value of 4.171 A, indicating effective formation of copper nanoparticles. SEM analysis revealed agglomerated nanoparticles with the smallest particle size of 5.63 nm. EDS characterization confirmed the presence of Cu as the main element along with other elements such as C, O, Cl, S, Na, and Ca originating from basil leaf secondary metabolites. The findings demonstrate that basil leaf extract has strong potential as an effective and eco-friendly natural bioreductant for copper nanoparticle synthesis.

Keywords: *copper nanoparticles, basil leaves, biosynthesis, green synthesis, natural bioreductant.*



DIGITAL TRANSFORMATION AND SALES PERFORMANCE IMPROVEMENT OF SAMBELONO EATERY: EVIDENCE FROM A CULINARY SME IN SIDOARJO, INDONESIA

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Digital transformation has become a critical factor in enhancing the competitiveness and sustainability of small and medium-sized enterprises (SMEs), particularly in the culinary industry. This study examines the impact of digital transformation on the sales performance of Sambelono Eatery, a culinary SME located in Sidoarjo, Indonesia. Specifically, the research evaluates the contribution of social media engagement, online ordering platforms, customer ratings, and customer retention to sustainable business growth. A quantitative descriptive case-study approach was employed using secondary data collected from company performance records during 2023–2025. The analysis focused on key performance indicators, including annual sales revenue, repeat customers, social media engagement, customer ratings, and online orders. Growth rates were calculated to assess the effectiveness of digital transformation initiatives implemented through digital platforms such as GoFood, GrabFood, ShopeeFood, and social media channels. The findings indicate that digital transformation positively influenced business performance. Annual sales revenue increased from IDR 968 million in 2023 to IDR 1.497 billion in 2025, achieving an average growth rate of 24.36%. Online orders grew by 23.98%, while social media engagement increased by 21.33%. Customer ratings remained consistently high at 4.8 out of 5, reflecting strong customer satisfaction and positive brand perception. However, repeat customer growth reached only 9.67%, remaining below the company target and indicating challenges in customer retention. The study concludes that digital transformation is a key driver of sustainable sales growth in culinary SMEs. Nevertheless, long-term business sustainability requires the integration of digital marketing initiatives with customer relationship management (CRM) strategies, loyalty programs, and personalized customer engagement practices.

Keywords : Digital Transformation, Sales Performance, Social Media Engagement, Online Ordering, Customer Retention.



**TALLENBOOST GAMES PENGEMBANGAN PLATFORM GAMIFIED CAREER
REDINESS ASSESMENT SEBAGAI STRATEGI INOVATIF DALAM
MENINGKATKAN KESIAPAN KERJA SISWA SMA DAN MAHASISWA MELALUI
SMART JOB RECOMMENDATION SYSTEM**

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The rapid development of the digital era requires young people to possess relevant and adaptive skills. However, many high school and university students still face difficulties in identifying their potential and determining suitable career paths. This study aims to develop TalentBoost Games, a gamification-based application designed to help users map their skills, improve competencies, and obtain appropriate career recommendations. The development method consists of several stages, including design, development, optimization, and publication. The system integrates skill-based games, user profiles, competency analysis, and features for career recommendations and verified job opportunities. The expected outcome is an application that enhances users' self-awareness of their potential, provides an interactive learning experience, and supports more informed career decision-making. By applying a gamification approach, this application is expected to increase learning motivation and better prepare young generations to face future workforce challenges.



GROBOGAN KULTURA: AN INTEGRATED DIGITAL PLATFORM FOR THE ADVANCEMENT OF CULTURAL TOURISM AND LOCAL MSMEs

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Grobogan Regency has significant potential in the fields of cultural tourism and Micro, Small, and Medium Enterprises (MSMEs). However, the optimization of these sectors is still constrained by several challenges, such as limited access to tourism information, the lack of integration between tourist destinations and local MSME products, and the underutilization of digital technology for regional economic promotion. These issues can reduce the quality of tourists' experiences and limit economic opportunities for local communities. To address these challenges, this study proposes "GROBOGAN KULTURA," an integrated digital platform designed to connect cultural tourism information with the local MSME ecosystem through a single access point. The platform is developed using a Management Information System approach based on the concept of smart tourism. The proposed system incorporates several technologies, including a Geographic Information Systems (GIS), digital MSME catalogs, location-based recommendation features, and a monitoring dashboard for stakeholders. Based on the simulation results and requirements analysis, the platform is expected to improve access to tourism information, expand the market reach of MSMEs, and strengthen collaboration between the tourism and creative economy sectors. In addition to serving tourists, the system also provides recorded data that can support local government decision-making through a data-driven approach. Therefore, GROBOGAN KULTURA is expected to become a digital transformation prototype that supports the preservation of cultural tourism while empowering MSMEs in a sustainable manner.

Keywords: Management Information System, Smart Tourism, Cultural Tourism, MSMEs, Digital Transformation.



IMPLEMENTATION OF ACCOUNTING INFORMATION SYSTEMS IN THE HUMAN RESOURCE MANAGEMENT CYCLE AND PAYROLL CYCLE OF CULINARY MSMEs: A CASE STUDY AT YOLAND'S KITCHEN, GROBOGAN REGENCY

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Human Resource Management (HRM) is a critical factor in supporting business success and sustainability, particularly in the culinary sector where employee performance quality directly determines service outcomes. This study aims to examine the implementation of the HRM cycle at Yoland's Kitchen, a micro, small, and medium enterprise (MSME) located in Grobogan Regency, Central Java. The HRM cycle analyzed encompasses workforce planning and recruitment, selection and training, job placement, performance appraisal, payroll management, and employee promotion and evaluation. The research employs a descriptive qualitative method with data collected through structured observation, in-depth interviews, and document analysis. The findings reveal that Yoland's Kitchen has implemented a simplified yet effective HRM cycle appropriate to its business scale. Direct management by the owner and team leader has contributed to improved service quality, stronger employee loyalty, and smooth operational continuity. Nevertheless, several operational constraints were identified, including limited recruitment channels, the absence of written Standard Operating Procedures (SOPs), and an unstructured HRM administrative system. To sustain business growth, a more systematic and digitally supported HRM framework is recommended.

Keywords: Accounting Information System; Human Resource Management; Culinary MSME; Payroll Cycle; Yoland's Kitchen



**ANALYSIS OF THE DISPARITY BETWEEN REGULATION AND REALITY:
EVALUATING THE IMPACT OF THE FREE NUTRITIOUS MEAL (MBG) PROGRAM
ON THE INCOME AND PROFIT MARGINS OF TRADITIONAL MARKET TRADERS
IN ARSO DISTRICT, KEEROM REGENCY, PAPUA**

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The Free Nutritious Meal (Makan Bergizi Gratis/MBG) program is a national priority policy introduced to enhance the quality of human resources while simultaneously providing economic stimuli for micro-enterprises at the local level. As a food buffer zone in Keerom Regency, Papua Province, Arso District is theoretically projected to receive a liquidity injection of up to IDR 8 billion per village annually. This study aims to evaluate the empirical impact of the MBG program on the income and profit margins of traditional market traders in Arso District using a *Sequential Explanatory Mixed Methods* approach. Quantitative data were obtained from a structured survey of 59 traders across the Arso II Folk Market, Jaifuri Market (Arso III), and Arsopura Market, which were subsequently elaborated qualitatively through interviews with key informants. The quantitative analysis reveals findings that contradict the *Keynesian Multiplier* projections of macro-policy. The traders' average perception scores across all income and profit indicators fell below the neutral value ($\mu < 3.00$), specifically concerning daily turnover ($\mu = 2.86$), profit margins ($\mu = 2.78$), and the sales volume of primary commodities ($\mu = 2.76$). This low performance is driven by a severe supply chain exclusion rate, wherein 94.92% of local traders are entirely disengaged from raw material procurement. Furthermore, qualitative findings expose institutional distortions, indicating that the Nutritional Fulfillment Service Units (SPPG) tend to prioritize internal supplies, self-cultivation, and closed partnerships, leading to patterns of patronage and nepotism. Instead of improving welfare, the program triggers a *negative spillover effect* by inducing shortages in agricultural commodities at the market level and inflating wholesale prices due to direct procurement competition with the SPPG, which ultimately compresses the profit margins of small-scale traders. This study recommends a regulatory restructuring of the National Nutrition Agency's (BGN) procurement system by enforcing mandatory purchasing quotas from traditional markets to foster spatial justice in Papua.

Keywords: Free Nutritious Meal Program (MBG), Traditional Market Traders, Keerom Regency, Papua



BEYOND HUMAN RESOURCE PRACTICES: A RESOURCE-BASED VIEW OF STRATEGIC HUMAN RESOURCE MANAGEMENT AND ORGANIZATIONAL PERFORMANCE IN ISLAMIC BANKING

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This study aims to explore the role of Strategic Human Resource Management (SHRM) in enhancing organizational performance from the Resource-Based View (RBV) perspective within the Islamic banking industry. Amid increasing competition, digital transformation, and regulatory changes, Islamic banks are required to develop sustainable competitive advantages by effectively managing their strategic resources. RBV argues that organizational performance is influenced by valuable, rare, inimitable, and non-substitutable resources, among which human resources are considered one of the most critical assets. Therefore, understanding how SHRM contributes to organizational performance through the development of strategic human capital becomes increasingly important in the context of Islamic banking. This research employs a qualitative approach using a case study design. Data were collected through semi-structured interviews with managers, human resource practitioners, and employees from Islamic banking institutions, complemented by document analysis and organizational reports. The data were analyzed using thematic analysis to identify patterns, themes, and relationships between SHRM practices and organizational performance outcomes. The findings indicate that SHRM practices, including strategic recruitment and selection, competency-based training and development, performance management, talent management, and employee engagement initiatives, play a significant role in strengthening organizational capabilities. These practices contribute to the development of human capital, organizational knowledge, and adaptive capabilities that align with RBV principles. Furthermore, the study reveals that the integration of Islamic values into HR strategies fosters employee commitment, ethical behavior, and organizational cohesion, which further support organizational effectiveness and long-term performance. The study concludes that SHRM serves as a strategic mechanism for transforming human resources into unique organizational assets that generate sustainable competitive advantages. From an RBV perspective, human capital and organizational capabilities emerge as key drivers of organizational performance in Islamic banking. The findings provide practical implications for managers seeking to enhance organizational performance through strategic human resource initiatives while maintaining alignment with Islamic principles. This study also enriches the literature on SHRM and RBV by offering contextual insights from the Islamic banking sector in an emerging economy.

Keywords: Strategic Human Resource Management (SHRM); Resource-Based View (RBV); Organizational Performance



EMPOWERING FARMER COMMUNITIES THROUGH CORN COB WASTE-BASED BIONEST FIBER INNOVATION FOR SUSTAINABLE CHILI CULTIVATION AND RURAL ECONOMIC GROWTH

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Abstract- Corn cob waste is an abundant agricultural byproduct that has not been optimally utilized by the community. This situation also occurs in the Lilo Rukun Minulyo Farmers Group in Sukolilo Village, Pati Regency, which still faces challenges in managing corn cob waste and a low germination rate for chili seeds, reaching only around 50–60%. This Community Service Program aims to develop and implement BioNest Fiber, an environmentally friendly growing medium based on corn cob waste, to increase the germination rate of chili seeds while supporting sustainable agricultural waste management. The implementation method includes preparation, outreach, training, practical training on making BioNest Fiber, mentoring, monitoring, and evaluation. The program is implemented in a participatory manner, actively involving farmer group members in all stages of the activity. The expected results are an increase in the utilization of corn cob waste to at least 80%, an increase in the germination rate of chili seeds to over 75%, and an increase in the knowledge and skills of farmer group members in processing agricultural waste. The BioNest Fiber innovation is expected to provide environmental benefits, increase agricultural productivity, and create sustainable economic opportunities based on local resources.

Keywords: BioNest Fiber, corn cobs, planting medium, chili germination, community empowerment.



TRANSFORMING WASTE INTO VALUE: A COMMUNITY-BASED CIRCULAR ECONOMY EMPOWERMENT MODEL IN GROBOGAN REGENCY

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Conventional household waste management under a linear model ("Buy-Use-Dispose") continuously strains regional sanitation budgets and leads to significant unrealized economic losses in Grobogan Regency. This study aims to examine and implement a local economic empowerment framework through a community-based circular waste ecosystem, positioning the "Jadwal SampahKu" digital platform as an enabling infrastructure to optimize the eco-commodity supply chain. The methodology adopts a participatory approach integrating local authority coordination, communal collection mapping, and an economic incentive conversion system based on reward points for households actively separating their waste. The evaluation demonstrates that establishing this ecosystem effectively transforms community members from passive waste producers into autonomous green economy actors. The strategic use of this digital tool significantly optimizes waste logistics by ensuring structured source-separation, directly cutting regional government expenditure on municipal waste maintenance. Furthermore, the program fosters community ecological autonomy by redirecting local organic waste into productive agricultural inputs and establishing alternative revenue streams for citizens. This study concludes that strengthening community capacity facilitated by circular digital instruments is a critical strategy to accelerate sustainable green economic growth at the regional level.



INTEGRATING THE SAVAR FRAMEWORK AND METAVERSE TECHNOLOGIES TO OPTIMIZE EDUCATIONAL MEDIA PRACTICALITY

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The emergence of metaverse technologies presents transformative opportunities for Industry 4.0 vocational education. This study evaluates the effectiveness, usability, and pedagogical impact of metaverse-based learning media structured through the SAVAR (Substitution, Augmentation, Virtual Learning, Apply, Re-evaluation) framework. Employing a mixed-methods design, the research integrates quantitative metrics of outcomes and engagement with qualitative feedback from students and educators. The SAVAR model systematically guided the transition to virtual simulation, fostering practical execution and iterative feedback. Findings reveal that this structured framework significantly improved vocational competencies, motivation, and collaborative interactions. Critical success factors include systematic application and rigorous re-evaluation phases, despite infrastructure and accessibility challenges. The study concludes that SAVAR-driven metaverse media offer a viable, impactful approach to fostering practical skills essential for modern labor markets. Future research should prioritize scalability, long-term efficacy of SAVAR phases, and bridging technological disparities.

Keywords: Metaverse, SAVAR Framework, Vocational Education, Learning Media, Mixed-Methods.



CARBON DOTS (CDS) BASED ON KLUWAK SHELLS (*PANGIUM EDULE*) USING A MICROWAVE-ASSISTED TECHNIQUE FOR DETECTION OF HEAVY METAL LEAD (PB)

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The potential of kluwak shell biomass for use as carbon dots (CDs) has been extensively studied. Kluwak shells contain high levels of lignin, hemicellulose, and cellulose, making them a suitable carbon source for CD synthesis. This study aims to synthesize and characterize carbon dots (CDs) derived from kluwak shells using a microwave technique, as well as to evaluate their potential as fluorescent sensors for detecting the heavy metal lead (Pb). The synthesis process was carried out with heating times of 0, 15, 20, and 25 minutes. Characterization was performed using Fourier Transform Infrared (FTIR), Ultraviolet–Visible Spectroscopy (UV-Vis), and Photoluminescence (PL). FTIR results indicated the presence of C=O, O–H, C=C, and C–O functional groups on the CDs surface. UV-Vis testing revealed two absorption peaks at wavelengths of 241–280 nm, while PL showed an emission peak at 506 nm with bright blue fluorescence. Sensitivity tests confirmed that the emission intensity decreases as the Pb concentration increases, with sensitivity values ranging from 0.116 to 0.771. These results indicate that CDs derived from kluwak shells have the potential to be used as simple, environmentally friendly, and effective sensors for detecting Pb metal ions at low concentrations.

Keywords: Carbon dots (CDs), Lead, Kluwak shells, Microwave, Photoluminescence.



RANDOM FOREST-XGBOOST STACKING ENSEMBLE FOR TOXIC COMMENT DETECTION ON ROBLOX

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This study developed a hybrid stacking ensemble model combining Random Forest (RF) and XGBoost for multi-class toxic comment detection in Indonesian gaming chat on Roblox. The dataset comprised 10,702 labeled comments across four categories: Violence, Harassment, Racist, and Neutral. Text preprocessing included case folding, URL removal, tokenization, slang normalization using a 200+ entry lexicon, stopword removal, and stemming. Features were extracted using TF-IDF with 10,000 maximum features and unigram-bigram n-grams. A stacking ensemble was constructed with RF and XGBoost as base models and Logistic Regression as the meta-classifier, trained using 5-fold cross-validation to prevent data leakage. The proposed model achieved an overall accuracy of 91.4% and macro F1-Score of 91.3%, surpassing standalone RF (87.2%) and XGBoost (89.5%) as well as IndoBERT-based baselines from prior work. McNemar test confirmed statistical significance of improvement over XGBoost ($\chi^2=10.46$, $p=0.0012$). Feature importance analysis identified discriminative.

Keywords : per class. These results confirm the effectiveness of hybrid ensemble learning for low-resource multilingual toxic content moderation.



COMPARISON OF RESAMPLING TECHNIQUES & MACHINE LEARNING ALGORITHM ON MATERNAL HEALTH RISK

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The high maternal mortality rate drives the need for accurate early detection systems for pregnancy risk. This study compares nine classification model combinations — three resampling techniques (SMOTE, SMOTE-Tomek Links, ADASYN) with three tree-based algorithms (Decision Tree, Random Forest, XGBoost) — using the UCI Maternal Health Risk dataset (1,014 records, 6 features). Preprocessing includes outlier handling via the IQR method and label encoding. Data was stratified-split 70:30 and validated with 10-Fold Cross Validation within an ImbPipeline framework to prevent data leakage. The best result was achieved by XGBoost + SMOTE with an Accuracy of 99.67% and F1-Score of 0.9967, followed by Random Forest + SMOTE-Tomek Links with a CV F1-Score of 0.9957 (± 0.0065). Feature importance analysis identified Blood Sugar (BS) as the most influential attribute (importance 0.5953), followed by Systolic Blood Pressure (0.1815) and Body Temperature (0.1014). This study confirms that XGBoost + SMOTE is the optimal combination for maternal health risk classification and has strong potential for implementation as a clinical decision support system in primary healthcare facilities.

Keywords: maternal health risk classification, SMOTE, SMOTE-Tomek Links, ADASYN, Decision Tree, Random Forest, XGBoost, 10-Fold Cross Validation, feature importance.



LIMITATIONS AND ADVANCES OF ASSOCIATION RULE MINING AND FP-GROWTH ALGORITHMS FOR TIME-VARIANT TRANSACTION DATA IN THE FOOD & BEVERAGE INDUSTRY

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The Food & Beverage (F&B) industry exhibits high volatility, where consumer preferences and market dynamics shift rapidly due to temporal factors such as contemporary trends, seasonality, and time of day. In the era of smart restaurants, leveraging high-volume Point of Sale (POS) transaction data is crucial for optimizing supply chains and menu engineering strategies. However, conventional Association Rule Mining (ARM) algorithms, such as FP-Growth, and current predictive analytics approaches possess fundamental limitations. These methods lack native temporal modeling, rely on static threshold parameters, and are prone to high computational overhead when processing dynamic F&B transactional data characterized by frequent null transactions. Consequently, the generated patterns are often obsolete, leaving a significant gap in integrating these trend patterns with autonomous decision-making systems capable of responding to market shifts independently. To address these limitations, this study proposes a novel framework that converges Trend-Aware Data Mining, Knowledge Graphs (KG)/Ontologies, and Agentic Artificial Intelligence (Agentic AI). At the data mining layer, the FP-Growth algorithm is modified using a Time Decay Factor approach and a Sliding Window strategy to enhance sensitivity to trends and minimize runtime. The extracted temporal transactional knowledge is then integrated into a semantic ontology model and a Knowledge Graph, serving as a structured database to model interdependencies between consumer behavior and inventory dynamics. Finally, this semantic knowledge is utilized as shared global information within a Multi-Agent System (MAS) ecosystem using a Centralized-Training-Decentralized-Execution (CTDE) architecture. An agentic workflow is implemented to automate tactical decisions in supply chain management (such as automated replenishment) and dynamic menu adjustments. This research makes a significant scientific contribution through the development of an efficient, lightweight variant of the temporal FP-Growth algorithm tailored for F&B transactional data. Furthermore, it formulates a novel ontology model that bridges temporal association patterns with smart restaurant dynamics and establishes a semantic-knowledge-based Agentic AI architecture for automating supply chain and menu engineering decisions. For the industry sector, the implementation of this framework is expected to optimize stock levels, reduce food waste, and significantly enhance operational efficiency and business profitability through agile, real-time, data-driven decision-making.

Keywords: Agentic AI, Multi-Agent Systems, Temporal Association Rule Mining, FP-Growth, Knowledge Graph, Smart Restaurant, Menu Engineering.



MODEL HIBRID KEAMANAN KOMUNIKASI DATA MENGGUNAKAN FEDERATED LATTICE-BASED CRYPTOGRAPHY DAN HOMOMORPHIC STEGNOGRAPHY DENGAN OPTIMASI QUANTUM-RESISTANT PROTOCOL

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Data communication security faces significant challenges with the development of quantum computing and the increasing complexity of cyberattacks. This research proposes an innovative hybrid model that combines Federated Lattice-based Cryptography (FLC) and Homomorphic Steganography (HS) with optimization of Quantum-Resistant Protocol (QRP) for data communication security. This hybrid approach addresses the weaknesses of conventional methods by providing layered security that is resistant to quantum threats and advanced persistent threat attacks. The research methodology uses an experimental approach with the simulation of attacks in a controlled communication environment. Results show that the proposed hybrid model increases resilience against side-channel attacks by 97.3%, reduces latency overhead by up to 42% compared to conventional post-quantum methods, and guarantees mathematical security even in the presence of an adversary with limited quantum computing capabilities. The main contribution of this research is the development of the FLC-HS-QRP algorithm that combines lattice-based key federation with homomorphic steganography in a quantum-resistant communication protocol, as well as parameter optimization for implementation on resource-limited devices. This research fills a critical gap in the literature on communication security and offers a practical approach to securing data communication in the era of quantum computing.

Keywords: data communication security; federated lattice-based cryptography; homomorphic steganography; quantum-resistant protocol; cryptographic key federation



ANALYSIS OF ALOE VERA AND LEAD (II) ACETATE ($\text{Pb}(\text{CH}_3\text{COO})_2$) COMPOSITE SYNTHESIS AS A CANDIDATE APRON MATERIAL

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The use of radiation, particularly X-rays, poses health risks when exposure occurs at high doses and over prolonged periods. Lead-based aprons are commonly used as protective shielding; however, they are heavy, rigid, and toxic. This study aimed to analyze the effect of varying compositions of *Aloe vera* powder and Lead(II) Acetate on the X-ray radiation absorption effectiveness of composite apron materials and to determine the optimal composition for effective X-ray attenuation. *Aloe vera* powder was prepared through drying, grinding, and sieving using an 80-mesh sieve. The composites were synthesized using a chemical method with three composition ratios of *Aloe vera* powder to Lead(II) Acetate: 100:0%, 80:20%, and 60:40%, while polyester resin was used as the matrix material. The characterization included density measurement, X-ray radiation absorption performance (half-value layer (HVL), linear attenuation coefficient, and Radiation Absorption Ratio (RAR)), and internal bond (IB) strength testing. The relationships among variables were analyzed using Pearson correlation analysis. The results demonstrated that increasing the proportion of Lead(II) Acetate enhanced the density of the composites (from 1.03 to 1.18 g/cm³), reduced the HVL (from 0.621 to 0.240 cm), and increased both the linear attenuation coefficient (from 1.116 to 2.887 cm⁻¹) and the RAR (from 74.99% to 89.26%). The equivalent thickness value decreased from 0.28 to 0.24 cm, while the internal bond strength increased significantly from 6.46 to 13.24 kg/cm². Pearson correlation analysis revealed a very strong relationship between the composite composition and X-ray radiation absorption effectiveness ($r = 0.917$). It can be concluded that the variation in composite composition significantly affects X-ray radiation absorption performance, with the optimal composition obtained in Sample C, consisting of 60% *Aloe vera* powder and 40% Lead(II) Acetate.

Keywords: Radiation shielding apron, *Aloe vera*, Lead(II) Acetate, Composite, X-ray radiation.



ENGLISH AS A GATEWAY TO GLOBAL MARKETS: A QUALITATIVE STUDY OF VANILLA BUYER OUTREACH

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English plays an important role in international business communication and provides opportunities for small businesses to access global markets. This qualitative exploratory case study investigates the role of English in international buyer outreach conducted by an Indonesian vanilla business owner. Data were collected from 22 outreach attempts targeting prospective buyers in Malaysia, Singapore, Brunei Darussalam, Saudi Arabia, the United Kingdom, Japan, and the United States. Additional data were obtained from buyer response records and local purchasing cases. Data were analyzed using the framework proposed by Miles, Huberman, and Saldaña. The findings indicate that English facilitated initial communication with prospective international buyers but did not always lead to business opportunities. Four themes emerged from the analysis: English as a gateway to international communication, positioning ambiguity, product-market compatibility, and trust and credibility. The findings suggest that successful buyer outreach depends not only on English proficiency but also on clear business positioning, product relevance, and trust-building strategies. This study contributes to the fields of English for Specific Purposes (ESP), business communication, and SME internationalization.

Keywords: English for Business Communication, Buyer Outreach, International Communication, Vanilla Business, SME Internationalization.



BRINGING BIOLOGY TO LIFE: DEVELOPING CANVA-ASSISTED ANIMATED COMICS FOR HUMAN SYSTEM LEARNING

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Innovative learning media are needed to address challenges in biology education, particularly in teaching complex topics that require high levels of student imagination and conceptual understanding. Based on preliminary observations at SMAS Muhammadiyah Jayapura, students experienced difficulties in learning the human respiratory system due to the abstract nature of the material and the limited use of engaging instructional media. This study aimed to develop, evaluate, and determine the effectiveness of Canva-assisted animated comic learning media on the topic of the human respiratory system. This research employed a Research and Development (R&D) approach using the Four-D (4D) model, consisting of the stages of Define, Design, Develop, and Disseminate. The developed media were validated by subject matter experts and media experts. Practicality testing involved one biology teacher and students through a small-scale trial (12 students) and a large-scale trial (35 students). The effectiveness of the media was measured using pre-test and post-test scores, analyzed through N-Gain and paired sample t-test. The results indicated that the Canva-assisted animated comic learning media achieved a high level of validity, with scores of 92.22% from material experts and 81.25% from media experts. The practicality assessment showed highly positive responses, with scores of 88.57% from the biology teacher and 93.57% from students, categorizing the media as very practical. Furthermore, the media demonstrated effectiveness in improving students' learning outcomes, as evidenced by an N-Gain score of 62.58%, which falls within the moderately effective category. The paired sample t-test revealed a significance value of 0.000 ($p < 0.05$), indicating a statistically significant improvement in students' learning outcomes after using the developed media. In conclusion, the Canva-assisted animated comic learning media is valid, practical, and effective for teaching the human respiratory system and can serve as an innovative instructional tool to enhance student engagement and learning achievement in biology education.

Keywords: Animated Comics, Canva, Learning Media, Human Respiratory System, Biology Education, 4D Model.



STUDENT ENGAGEMENT IN BLENDED LEARNING ENVIRONMENTS: A SYSTEMATIC REVIEW OF EFFECTIVE DESIGN STRATEGIES AND PEDAGOGICAL IMPLICATIONS

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Background: Blended learning has emerged as one of the most transformative instructional paradigms in higher education. However, the specific design elements and pedagogical strategies that most effectively foster student engagement remain insufficiently understood. **Objective:** This study aimed to identify effective blended learning designs and pedagogical strategies that promote behavioral, cognitive, and affective dimensions of student engagement. **Methodology:** This study employed a systematic review approach following the PRISMA protocol. A total of 42 peer-reviewed studies published between 2004 and 2024 were selected from ERIC, Scopus, and Web of Science databases. **Results:** Findings revealed that teacher–student interaction is the strongest predictor of engagement, followed by active learning activities such as collaborative problem-solving and peer discussion. Learning management systems, instructional videos, and interactive polling tools enhance engagement when intentionally integrated into course design. Socioeconomic status, digital literacy, and institutional infrastructure were identified as significant moderating variables. **Conclusion:** Effective blended learning environments require intentional instructional design, meaningful interaction, and appropriate technological integration to maximize student engagement.

Keywords: *blended learning, student engagement, instructional design*



THE BENEFIT OF ARTIFICIAL INTELLIGENCE (AI) IN ENGLISH LANGUAGE TEACHING

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The use of Artificial Intelligence technology in English language learning brings many real benefits to students and teachers. AI intelligence that helps humans do tasks that require intelligence in a short time. The definition of AI is an artificial intelligence tool. The existence of AI in education brings a new revolution, as well as innovation, development, and benefits in education, especially in foreign languages. AI facilitates the implementation and generation of teaching plans. Including creating teaching modules and supporting teaching media. The use of Artificial Intelligence AI in English language learning is increasingly showing great potential for teachers by improving the quality and effectiveness of the teaching and learning process. This Research is a literature study focusing on the development and use of Artificial Intelligence in English language teaching. By conducting library research, this study aims to benefits in implementing AI as an efficient English language learning tool that can be used by teachers and adapted to students' needs. This article used Descriptive analysis with a qualitative approach. This indicates that the data used is secondary data, specifically related to the benefits of artificial intelligence for English language learning. The results reveal that AI has benefits in English language teaching and helps facilitate effective educational transformation.



THE TRANSFORMATION OF PEDAGOGICAL COMPETENCE FROM THE DIGITAL ERA TO THE AI ERA

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Digital technology and Artificial Intelligence (AI) have brought important changes to educational practices and teachers' pedagogical competence. However, studies on the transformation of pedagogical competence from the digital era to the AI era are still limited. This study aims to explore the transformation of pedagogical competence from the digital era to the AI era and its challenges. The present study uses a library research method. The data sources were collected from various journals, specifically fifteen journals related to pedagogical competence in the digital and AI eras. The results show that pedagogical competence has transformed significantly from emphasizing basic digital skills and the use of technology to emphasizing AI literacy, adaptive teaching strategies, and how the integration of AI tools in education. Teachers in the AI era not only master basic digital skills but also critically use and evaluate AI applications, fit instruction to students' needs, and make sure that AI tools can already support the teaching and learning process. Despite its benefits, there are also challenges found including teachers' difficulties in using AI tools, lack of training in AI application, limited readiness to adapt to AI technology, and limited understanding of how AI can be used effectively in the teaching and learning process. These findings highlight the importance of on-going training with a clear implementation that strengthens both digital and AI literacy. This study contributes to a deeper understanding of pedagogical competence and provides insights for teachers, institutions, and policy makers.

Keywords: transformation, pedagogical competence, digital era, AI era



A SYSTEMATIC REVIEW: THE IMPACT OF DIGITAL PROFICIENCY ON TEACHER PROFESSIONAL DEVELOPMENT

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In the rapidly evolving digital education landscape, teachers require digital proficiency not merely as a technical skill but as a foundational competency for effective professional development and classroom innovation. This systematic review examines how teacher digital proficiency influences professional development outcomes and identifies mediating pedagogical, psychological, and institutional factors across varied educational settings. Following PRISMA guidelines, a document based analysis was conducted on fifteen peer reviewed studies published between 2021 and 2025 across databases such as Scopus, Google Scholar, SINTA, Garuda, and Semantic Scholar. Thematic content analysis synthesized the findings by mapping them against the DigCompEdu and UNESCO ICT Competency Framework for Teachers. The findings reveal that digital proficiency consistently predicts enhanced teacher performance, teaching creativity, and professional identity development, particularly through professional engagement and pedagogical applications. However, challenges like infrastructure gaps, time constraints, and motivation heavily mediate these outcomes, while organization and learner empowerment competencies remain underrepresented. In conclusion, teacher digital proficiency emerges as a vital catalyst for modern professional development. Therefore, professional development providers must prioritize sustained and framework guided training. Such programs are essential to actively remove systemic barriers and ensure equitable digital competence across educational contexts.

Keywords: Digital Proficiency, Teacher Professional Development, TPD, Education



A SYSTEMIC REVIEW ON THE ROLE OF AI IN TPACK'S IMPLEMENTATION

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The development of Artificial Intelligence (AI) technology is increasingly influencing the world of education. Particularly in how teachers integrate technology, teaching methods, and lesson content. This study aims to understand how AI supports the implementation of the Technological Pedagogical Content Knowledge (TPACK) framework in teacher education. This study was conducted by systematically reviewing 15 studies published between 2023 and 2025 from various reputable journals. The results indicate that AI helps teachers design more engaging and adaptive learning, for example through the use of chatbots, generative AI, and automated learning systems. However, not all teachers are able to utilize AI effectively in their learning. This condition can happen because a lack of training, institutional support, and an understanding of the ethics of technology use. This study emphasizes the importance of developing AI-based TPACK (AI-TPACK), which emphasizes not only technological capabilities but also responsibility and discretion in its use. These findings can serve as a basis for educational institutions to create more relevant teacher training in the digital age.

Keywords: Artificial Intelligence (AI), TPACK, AI-TPACK



DIVIDEND POLICY, LEVERAGE, LIQUIDITY, AND FIRM VALUE: THE MEDIATING ROLE OF PROFITABILITY

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This study aims to analyze the influence of dividend policy, leverage, and liquidity on company value with profitability as an intervening variable in manufacturing companies listed on the Indonesia Stock Exchange. This study employed a quantitative method based on positivism philosophy. The population in this study was manufacturing companies listed on the Indonesia Stock Exchange from 2021-2023, totaling 165 companies. The sample used in this study consisted of 54 companies that met the criteria. The data analysis method used in this study was Partial Least Square using the Smart PLS application. The results show that (1) Dividend policy does not influence company value. (2) Leverage does not influence company value. (3) Liquidity has a positive and significant influence on company value. (4) Profitability does not influence company value. (5) Dividend policy influences profitability. (6) Leverage influences profitability. (7) Liquidity does not influence profitability. (8) Profitability is unable to mediate the influence of dividend policy on company value. (9) Profitability is unable to mediate the influence of leverage on company value. (10) Profitability is unable to mediate the influence of liquidity on company value.

Keywords: Dividend Policy, Leverage, Liquidity, Company Value, and Profitability



MAPPING INDONESIAN HOAX NARRATIVES ACROSS SENTIMENT, TOPICS, TIME, ENTITIES, AND LANGUAGE PATTERNS

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This research presents a systematic characterization of 3,703 Indonesian government-verified hoaxes from Kominfo (2024–2026) using an integrated 5-insight analytical framework that deploys five complementary analytical perspectives including sentiment analysis with IndoBERT, topic modeling with BERTopic, temporal trend analysis using Mann-Kendall statistics, named entity recognition via BERT-Indo-NER, and linguistic pattern analysis combining ANOVA and Logistic Regression to understand what hoaxes target, how they evolve temporally, who and what they focus on, and how they differ linguistically. Key findings reveal that impersonation hoaxes dominate the dataset at 82.7%, fraud hoaxes employ persistent and persuasive language patterns with the highest positive language ratios, health misinformation concentrates emotional appeals with elevated negation ratios, entity targeting is predictable and event-driven with 30,614 extracted entity mentions across multiple hoax categories, and linguistic fingerprints enable automated detection with 83.9% accuracy that can identify hoax types from structural patterns alone. All findings are policy-actionable for content moderation, entity protection, and early warning systems, demonstrating that this interpretable, domain-transparent methodology is extensible to other languages and datasets while providing empirical evidence for governments, platforms, and digital literacy initiatives to address misinformation at scale.

Keywords: Hoax Detection; Computational Social Science; IndoBERT; BERTopic; Temporal Trend Analysis; Named Entity Recognition.