EDINNOVATE
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EDINNOVATE 2025

2nd EdInnovate 2025: Innovations in Education and e-Learning

27th-28th March, 2025 I Tokyo, Japan

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Organized by

IFERP® Academy
Explore Your Research Journey...

"Driving Educational Excellence through Digital Transformation"

2nd EdInnovate 2025: Innovations in Education and e-Learning, Tokyo, Japan

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Conference Theme

“Driving Educational Excellence through Digital Transformation”

Preface

We are delighted to extend a warm welcome to all participants attending 2nd EdInnovate 2025: Innovations in Education and e-Learning organized by Institute For Educational Research and Publication (IFERP Academy) on March 27th and 28th, 2025 at Tokyo Marriott Hotel, Tokyo, Japan. This conference provides a vital platform for researchers, students, academicians, and industry professionals from all over the world to share their latest research results and development activities in the field of e-learning and education. It offers delegates an opportunity to exchange new ideas and experiences, establish business or research relationships, and explore global collaborations.

The proceedings for 2nd EdInnovate 2025 contain the most up-to-date, comprehensive, and globally relevant knowledge in the field of e-learning and education. All submitted papers were subject to rigorous peerreviewing by 2-4 expert referees, and the papers included in these proceedings have been selected for their quality and relevance to the conference. We are confident that these proceedings will not only provide readers with a broad overview of the latest research results in e-learning and education but also serve as a valuable summary and reference for further research in this field.

We are grateful for the support of many universities and research institutes, whose contributions were vital to the success of this conference. We extend our sincerest gratitude and highest respect to the many professors who played an important role in the review process, providing valuable feedback and suggestions to authors to improve their work. We also extend our appreciation to the external reviewers for providing additional support in the review process and to the authors for contributing their research results to the 2nd EdInnovate 2025.

Since January 2025, the Organizing Committees have received more than 100+ manuscript papers, covering all aspects of 2nd EdInnovate 2025. After review, approximately 35+ papers were selected for inclusion in the proceedings of 2nd EdInnovate 2025. We would like to thank all participants at the conference for their significant contribution to its success.

We express our gratitude to the keynote and individual speakers and all participating authors for their dedication and hard work. We also sincerely appreciate the efforts of the technical program committee and all reviewers, whose contributions made this conference possible. Finally, we extend our thanks to all the referees for their constructive comments on all papers, and we express our deepest gratitude to the organizing committee for their tireless work in making this conference a reality.

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About EdInnovate 2025

EdInnovate 2025: Innovations in Education and e-learning bring together a wide group of scholars, educators, and researchers. Organized by The IFERP Academy, this exciting conference calls for everyone to share the latest findings, explore various educational techniques, and encourage digital transformation in education. Taking place on the 27th and 28th of March 2025 in Tokyo, Japan, EdInnovate 2025 is set to host lively debates, presentations & publication opportunities, and insightful events.

"Driving Educational Excellence through Digital Transformation"

Scope

In an environment that is constantly evolving, it is more important than ever to acknowledge and implement new technologies in education. Our theme for EdInnovate 2025 is "Driving Educational Excellence through Digital Transformation," and we will be examining the critical role that digital transformation plays in driving excellence in education and its application in addressing complex issues.

Benefits

- Exposure to Expertise
- Out-of-the-Box Thinking
- Presenting and Publishing opportunity
- Networking Opportunities
- Knowledge & Skill Development
- Increased Visibility of Work

Objective

The objective of EdInnovate 2025 is to advance the quality of education through digital transformation, while also encouraging collaboration, skill development, and driving innovation. Here are some of the many objectives that we aim to achieve:

- Skill Development
- Promote Discussion
- Engage in Meaningful Conversation
- Embrace Digital Transformation
- Spotlight Innovation
- Fuel New Research Horizons
- Tackle Pressing Challenges
- Improve Educational Excellence
- Network and Grow

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About IFERP

IFERP Academy is a well-known organization that focuses on engineering, science, and technology. IFERP envisions a global scientific community united by innovation in digital technology. The organization prioritizes advancing industrial trends, disseminating the most recent findings, and encouraging research endeavours that will shape the future of humanity.

With a team of experts, IFERP has established itself across Europe, the Middle East, Asia, and several other countries, including Iraq, Malaysia, Australia, and more. They have offered publication, networking, research support, and other work in various fields of science.

IFERP is an expert at putting together international conferences that bring together scientists, researchers, academics, students, and professionals from all over the world to collaborate. They also publish articles and publications that are indexed by Web of Science and SCOPUS. Important webinars are organized by IFERP and they also offer comprehensive research aid and guidance. Key elements of IFERP's objective include promoting Industry-Institute Interaction and taking part in Youth Empowerment projects. Through faculty growth, skill development, and ongoing research and publication projects, the organization is dedicated to helping professionals.

Mission

"Upskilling the knowledge hub through technological innovation and excellence for the benefit of humanity"

Vision

"A Digitally equipped robust, dynamic & swift professional community integrating academics & industry for upgraded technical knowledge implementation"

What We Do?

IFERP is dedicated to enhancing the professional experience by giving professionals access to a top-notch platform. They are committed to the following pursuits:

- Academic Resource Accessibility
- Diverse Educational Programs
- Drive Innovation
- Knowledge Sharing and Collaboration
- Publication & Recognition

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Director's Message, IFERP

Mr. A. Siddth Kumar Chhajer

Managing Director & Founder,
IFERP Academy,
Technoarete Group

Welcome All!

On behalf of Institute For Educational Research and Publication (IFERP Academy) & the organizing Committee, I express my hearty gratitude to the Participants, Keynote Speakers, Delegates, Reviewers and Researchers.

The goal of the 2nd EdInnovate 2025: Innovations in Education and e-Learning is to provide knowledge enrichment and innovative technical exchange between international researchers or scholars and practitioners from the academia and industries in the field of Education and e-Learning.

This conference creates solutions in different ways and to share innovative ideas in the field of Education and e-Learning. 2nd EdInnovate 2025 provides a world class stage to the Researchers, Professionals, Scientists, Academicians and Students to engage in very challenging conversations, assess the current body of research and determine knowledge and capability gaps.

2nd EdInnovate 2025: Innovations in Education and e-Learning will explore the new horizons of innovations from distinguished Researchers, Scientists and Eminent Authors in academia and industry working for the advancements in Science and Engineering from all over the world. 2nd EdInnovate 2025 hopes to set the perfect platform for participants to establish careers as successful and globally renowned specialists in the field of Education and e-Learning.

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CEO's Message, IFERP

Mr. Rudra Bhanu Satpathy

CEO & Founder,
IFERP Academy,
Technoarete Group

Hello All!

IFERP is hosting the 2nd EdInnovate 2025: Innovations in Education and e-Learning this year in month of March, 2025. The main objective of 2nd EdInnovate 2025 is to grant the amazing opportunity to learn about groundbreaking developments in modern industry, talk through difficult workplace scenarios with peers who experience the same pain points and experience enormous growth and development as a professional. There will be no shortage of continuous networking opportunities and informational sessions.

The sessions serve as an excellent opportunity to soak up information from widely respected experts. Connecting with fellow professionals and sharing the success stories of your firm is an excellent way to build relations and become known as a thought leader. I express my hearty gratitude to all my Colleagues, Staffs, Professors, Reviewers and Members of Organizing Committee for their hearty and dedicated support to make this conference successful. I am also thankful to all our delegates for their pain staking effort to make this conference successful.

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About Keynote Speaker

Biography

Associate Professor Ts Dr Goh Wei Wei is currently the Digital Health and Innovations Impact Lab Deputy Director and Programme Director of Bachelor of Information Technology, senior lecturer at the School of Computer Science at Taylor's University. She received her Ph.D. major in E-learning from the University of Derby, UK. She has been in the academic for the past 20 years. Dr Goh Wei Wei has been working on learning, teaching and assessment design strategies, online learning technologies, social media technologies, knowledge management, Machine Learning and Internet of Things research. She emphasised her familiarity with online technologies due to her experience of using them in teaching as she likes to develop technology-rich classrooms. She has been working on various multi-disciplinary projects with the Design School too. Dr Goh Wei Wei has recently won 2 gold medal awards, and 1 bronze medal award in International University Carnival on E-learning (IUCEL) 2022, 1 bronze medal award in Econdev 2022 for her experience in developing technology- rich classrooms initiatives. She introduced Engage VR platform to create an immersive presence in the virtual learning environment to her students. She also let her students have the hands-on experience of using the Oculus Quest 2 and HoloLens to experience Augmented Reality and Virtual Reality. Dr Goh Wei Wei also won a total of 4 silver medals award in Malaysia Technology Expo (MTE) in year 2021 and 2022 for her innovative Internet of Things prototype development related to digital health and innovations. She also won silver medal for Smart Medication Management and Medicine Delivery System in 32nd International Invention, Innovation and Technology Exhibition in 2021. Dr Goh Wei Wei has the practical skills, the hands-on experience and the educational credentials to make a significant difference to the university.

Dr. Goh Wei Wei

Head of Department
School of Computer Science
Taylor's University,
Malaysia

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About Keynote Speaker

Syahrul Nizam Junaini

Senior Lecturer
Universiti Malaysia Sarawak
Malaysia

Biography

Ts. Syahrul Nizam Junaini is a Senior Lecturer at the Faculty of Computer Science and Information Technology (FCSIT), Universiti Malaysia Sarawak (UNIMAS). He was the Deputy Director (Learning Technology) at the Centre for Applied Learning and Multimedia (CALM), UNIMAS. He is also the recipient of the Teaching Award (Applied Science) at the National Academic Award (AAN) in 2017. He published article in top-tier Q1 journals such as Agricultural Systems (IF: 6.6) journal and Journal of Cleaner Production (11.1). He is a also a reviewer for various Q1 journals, including the International Journal of Human-Computer Interaction, Education and Information Technologies, Multimedia Tools and Applications, and IEEE Communications Magazine.

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About Keynote Speaker

Ms. Yuri Hirayama

School Director, Principal Educator
Chief Sustainability Officer
Yuri Education Center
Mexico

Biography

In “Yuri Education Center”, I fulfill the positions of Chief Sustainability Officer, Social Impact Director, and educator. It is an independent educational institution dedicated to promoting active learning methods. Students are immersed in a dynamic learning environment where they gain proficiency in science, sustainability, and English. They are encouraged to identify pressing issues, set achievable goals, and proactively implement solutions. If there is anything that can make this world peaceful and sustainable, that is EDUCATION. YouTube for my interview: https://www.youtube.com/watch?v=9k6lhl8yTkE YouTube discussion: Bridging the Gender Gap in Industry and Leadership: https://youtu.be/RJglnE2kuKg?si=bhBCGr78aCIE15Vh I received the Education 2.0 Conference Outstanding Leadership Award in February 2024. Our educational philosophy: WE courageously DISCUSS, actively LEAD, and collectively ACT. In “Yuria’s Happy English program”, many parents and children, aged 4 months to 3 years, enjoy learning English songs and sustainability topics. I read a lot of books about animals, sea creatures, and nature. I also empower women especially mothers who have small children. In our center, students aged 4 to 18 learn math, science, and social studies both in Japanese and English. Students aged 8 and above participate in sustainability classes, discussions, presentations, and workshops. I regularly conduct workshops of SDG 12 responsible consumption and production. Each student selects and presents their own SDG 12 topic. In our Zoom sessions, I encourage students to speak and courageously communicate with people from all over the world including students aged 8 to 18, sustainability practitioners, professors, and adult attendees. Also, I am committed to a sustainable future by making products (YURINDI) from recycled materials, helping lower-income communities with the sales, and promoting their independence through intermediate care and educational support. My sandal project is a signature project. Durable and fashionable sandals are made from used motorcycle tires and clothes. I am uniting the world with great traditional craftsmanship to help realize a sustainable world. I hold experiential studies and in-depth academic discussions around the 17 SDGs. Our current emphasis is on helping communities in promptly securing safe water collection through the use of our sustainable protective footwear. We provide education on sanitary practices to ensure ongoing water safety.

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About Keynote Speaker

Mr. Sujan Sanku

Japan Chapter President,
Co-founder & COO
Asian-African Chamber of
Commerce and Industry,
99 InfoSystems Inc.
Japan.

Biography

Sujan Sanku launched his first business in 2006, just before turning 18, leveraging changes in the Japanese Company Act. Overcoming the challenges of a young entrepreneur in a foreign, non-English speaking country, he grew my venture successfully. With expertise in accounting, communication, finance, IT, law, and management, He has spent over a decade bridging gaps for multinational organizations worldwide. His multicultural background—Indian heritage and US/UK education—provides a unique perspective, honed through navigating crises like the 2008 and 2014 financial downturns and the COVID-19 pandemic. As a passionate advocate for education, he believes in the transformative power of life experiences for professional and social growth. Sujan Sanku excel in marketing across industries and countries, thriving in challenging situations where problem-solving is key.

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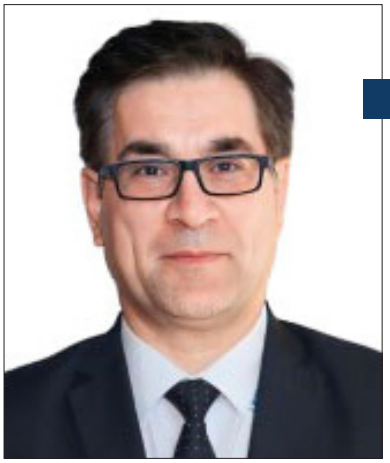
About Keynote Speaker



Biography

Tarik Ahmed Rashid is a Principal Fellow of the Higher Education Academy (PFHEA-UK) and a Professor of Computer Science and Engineering at the University of Kurdistan Hewlêr (UKH), Iraq, where he also serves as the Director of the Artificial Intelligence and Innovation Center. He completed his Ph.D. in Computer Science and Informatics at University College Dublin (UCD), Ireland, followed by a Post-Doctoral Fellowship in the same institution. His research spans Artificial Intelligence, Nature-Inspired Algorithms, Machine Learning, Computational Intelligence, and DNA Computing, with contributions to metaheuristic optimization. He has developed multiple optimization algorithms (FDO, FOX, SHOA, etc.) and machine learning techniques (Artificial Liver Classifier (ALC), Foxtsage). Recognized among the Top 4 researchers in Iraq (2019–2023) and listed in Stanford University's "World's Top 2% Scientists" (2021–2024), he has 140+ Scopus and Web of Science-indexed publications, including books and book chapters with Springer, Elsevier, and CRC. He is a keynote speaker, journal editor, and IEEE/MIR Labs member, actively contributing to international conferences as a chair and program committee member.

Dr. Tarik A. Rashid

Professor in Computer Science/
Artificial Intelligence,
Director of the Centre for Artificial Intelligence and Innovation
Dean of the School of Science and Engineering
University of Kurdistan Hewler Iraq.

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About Session Speaker

Dr. D. William Albert

Head, CSE Department
Bheema Institute of Technology & Science (2K),
Adoni, India.

Biography

Dr.D.William Albert, Professor in CSE Department working in Bheema Institute of Technology & Science, Adoni, Andhra Pradesh. Received Ph.D. degree in CSE from Mahatma Gandhi University, Meghalaya, India, in 2017. Published 125 National & International Journals, 8 Patents, 8 Text Books, one Book Chapter, and 9 NPTEL-SWAYAM Online certifications and Editorial Board Member for 3 International Journals. The Ph.D research topic is "A Framework on High Speed Association Rule Mining Using GPGPU- Explorative Studies".Dr. Albert is a Life Member of the Indian Society for Technical Education (ISTE) & Computer Society of India (CSI), and Professional Member in IRED, SDIWC, IAENG. The areas of interest are Software Engineering, Software Project Management, Software Testing Methodologies, Big Data Analytics, Database Management System, Operating Systems and Web Technologies, Full Stack Development.

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About Session Speaker

Dr. Malini Eliatamby

Vice President (Academic) Asia and Egypt
Cintana Education
United States

Biography

Dr. Malini Eliatamby has a wealth of experience in the education sector, with a focus on academic leadership and innovation. Dr. Malini is currently serving as the Vice President Asia Pacific (Academic) at Cintana Education and also holds the position of Senior Academic Director. Prior to this, Dr. Eliatamby served as the Deputy President (Operations) at INCEIF, The Global University of Islamic Finance. Dr. Malini also held the role of Chief Academic Officer at INTI International University and Colleges from 2017 to 2022. Before that, they were the Deputy Vice Chancellor (Academic Innovation) & Group Vice President (Teaching Learning Innovation) at INTI International University and Colleges. Dr. Eliatamby has also held various academic leadership positions at INTI International University and INTI Education Group. Dr. Malini began their career at Sime Darby Berhad as a Dean and also worked as a Programme Director at Taylor's College. Dr. Malini Eliatamby completed a PhD in Neurochemistry at the University of Malaya from 1992 to 1996. Dr. Malini later pursued further education in Enterprise Risk Management at Udemy, although the exact dates for this program are unavailable.

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About Session Speaker

Dr. Tony Mays

Director: Education
Commonwealth of Learning
Canada.

Biography

Tony Mays is Director: Education and Education Specialist in Open Schooling at the Commonwealth of Learning. He was formerly Manager of the Unit for Distance Education at the University of Pretoria and before that Senior Programme Specialist: Higher Education with Saide in South Africa. He works/has worked with a number of higher education institutions in the areas of strategic planning, systems review, operational coordination, ODL policy and practice, quality assurance and evaluation, curriculum design, Open Educational Resources (OER) and the management of teaching practice within South Africa as well as more widely in the sub-Saharan Africa region and internationally. He has published/co-published textbooks for Grade 12 Language and Literature and Teacher Education and presented papers and published journal articles on ODL policy, practice and costing as well as ODL for teacher education and OER. He is a former President of the National Association for Distance Education and Open Learning in South Africa. Tony holds a BAHons (Wales), PGCE (Westminster College, Oxford), BEdHons (Natal), MEd (Unisa), DEd (Unisa).

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About Session Speaker

Biography

Trainer of teams and leaders with nearly 10 years of experience, holding an MBA in Executive Leadership, and certified in educational management, instructional design, and hybrid teaching. Experience in implementing teaching methodologies in virtual environments, designing programs that foster effective and meaningful learning experiences. Focus on developing pedagogical strategies tailored to learners' needs, integrating practices that encourage active participation and autonomous learning in digital contexts.

Ms. Alessandra Lescano

Directora de Educación
Patronato Gastronómico del Perú
Peru.

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About Session Speaker

Mr. Andy Ramsden

Director of Distance Learning
Arden University
United Kingdom

Biography

Andy Ramsden is the Director of Distance Learning at Arden University, where he leads innovative strategies to enhance digital learning. With over 25 years of experience in Higher Education, he has played a pivotal role in transforming educational institutions towards a digital-first approach, focusing on enhancing accessibility, flexibility, and student success. Andy has been instrumental in projects focusing on improving student success through data-driven decision-making and digital tools. His interests include implementing adaptive learning systems, AI in education, immersive learning, and professional development for educators in digital environments. His leadership in advancing distance and blended learning models aligns closely with the EdInnovate 2025 theme of driving educational excellence through digital transformation.

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About Session Speaker

Dr. Sakinah Ali Pitchay

Director – Centre of Soft Skills Development
Universiti Sains Islam Malaysia
Malaysia.

Biography

Dr. Sakinah Ali Pitchay is an Associate Professor at Universiti Sains Islam Malaysia's Information Security and Assurance Programme. She received her PhD in Computer Science from the University of Birmingham, UK, and her Master's Degree in Software Engineering from UTM KL. She obtained her bachelor's degree from UMT. She has served as the Head of Programme in Computer Science from 2015 to 2020. She was appointed Director for the Centre of Soft Skills Development starting Jan 2025, was a Deputy Dean from 2021 to 2024 and Head of the Programme for 5 years. She is passionate about image enhancement, software engineering, and information security. She was the invited keynote speaker at the Int. Conf. on Multi-Disciplinary Research Studies & Education, Tech Tactics Education 2023 in the USA, 2nd Advanced Research in Engineering and Information Technology (AVAREIT) 2018, Japan Advanced Institute of Science and Technology (JAIST) in 2018 and the 11th International Conference on Green Technology organized by Universitas Islam Negeri Maulana Malik Ibrahim, Malang, Indonesia and also speaker for Graduate Employability Seminar since 2021. She has been invited to serve as the invited speaker for various Innovation Talks, Hackathons, LinkedIn workshops and student development talks. She won many innovation competitions and was recently awarded the Best Innovation Award 2024, 1st Winner Global Cybersecurity Award 2023 in UAE, Excellent Service Medal 2024 by the Malaysian Ministry of Higher Education and Graduate Employability Personality Award in 2022. She has been actively contributing her expertise to the Ministry of Higher Education, specifically the Matriculation Division, since 2013. In addition, she has reviewed numerous articles and has been involved in consultation on system requirements. She has successfully supervised several postgraduate students and has been appointed as an international external examiner. She also contributes to society as an online tutor for months organized by Yayasan Petronas and in international community activities. Also, energetically contribute to the community via Cyber Hasanat, the cybersecurity physical board game.

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About Session Speaker

Mr. Chasen Stahl

Director
Aoba Global Campus
Tokyo, Japan

Biography

Chasen Stahl is the Director of Innovation for the Aoba International School Group in Tokyo, Japan, and the Director of Aoba Global Campus, an innovative online education division delivering cutting- edge international programs to students worldwide. With over a decade of experience leading teams, projects, programs, and new product development in education and educational technology, Chasen's work and research focus on the intersection of technology, pedagogy, and human development, synthesizing these disciplines to create transformative learning experiences. His expertise lies in leveraging emerging technologies to enhance student engagement, foster inquiry-based learning, and expand access to high-quality education in both physical and digital environments.

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Abstract's Index

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The Role of Digital Technology in Implementing the Independent Curriculum in the Era of Society 5.0 in Sociology Education

Windri Wisti
Indonesia University of Education, Indonesia

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Indonesia University of Education, Indonesia

This study aims to conduct an in-depth analysis of the integration of technology within the Merdeka Curriculum, with a specific focus on sociology education in the context of Society 5.0. This study is crucial due to the limited existing research, particularly in the field of sociology, on how technology can be effectively integrated into the Merdeka Curriculum and the strategies required for its incorporation into sociology education in the digital age. The research employs a qualitative approach through a literature review, synthesizing findings from various related sources and drawing conclusions based on the literature. The study highlights several challenges, including limited access to technology-based learning resources, inadequate facilities, and low digital literacy among educators. The findings reveal several technology-based tools, including interactive multimedia via Android applications, social media, audiovisual media, Google Sites, and podcasts, which can be effectively utilized in sociology education in the digital era. These tools offer an innovative learning experience for students by facilitating the integration of technology into the Merdeka Curriculum. This research emphasizes the critical role of educators in understanding and adopting technology as key facilitators of the learning process. It also highlights the need for educators to enhance their digital competencies in order to meet the challenges of the digital age, thereby ensuring the successful implementation of the Merdeka Curriculum in alignment with Society 5.0. Finally, this research aims to serve as a valuable resource for educators, inspiring creativity in developing and utilizing sociology learning media that actively engage students, thereby creating learning experiences that align with the demands of the Merdeka Curriculum in the era of Society 5.0.

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Physics Learning Design Based on Transformative Inquiry-Physics Edutainment

Anderias Henukh
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Universitas Pendidikan Indonesia, Indonesia

Lilit Rusyati
Universitas Pendidikan Indonesia, Indonesia

Dadi Rusdiana
Universitas Pendidikan Indonesia, Indonesia

Muhammad Haidar Ali
Universitas Musamus, Indonesia

Ivylentine Datu Palittin
Universitas Musamus, Indonesia

This study aims to develop a physics learning design based on inquiry transformation with a physics-edutainment approach to Electricity. The method used in this study is a quasi-experiment using the ADDIE development model (analysis, design, development, implementation, evaluation) as a basis for developing e-modules. This study was conducted in one of the junior high schools in Indonesia. The study subjects were junior high school students in grade IX who were selected through purposive sampling techniques. The research instruments consisted of a concept understanding test, expert validation sheets, questionnaires, and observation sheets for student and teacher responses. The data analysis technique used descriptive analysis. In addition, NGain was used to measure the improvement in learning outcomes. The independent sample t-test statistical test was used to compare the effectiveness of learning outcomes related to using E-modules. The results of the material validation obtained a percentage of 93.63%, media validation of 85.41%, and language validation of 97.56%. The results of the student response test showed 86.6%, while the teacher response test obtained a percentage of 95.14%. The average N-gain of the experimental class was 29.31% higher than that of the control class, with a difference between the experimental and control classes. The difference in N-Gain between the experimental and control classes was significant ($p < 0.001$), indicating that the learning method applied to the experimental class was more effective than the control class. Based on the study's results, the design of physics learning based on inquiry transformation with a physics-edutainment approach is recommended as an innovative alternative to learning static electricity material at the junior high school level.

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From Algorithms to Understanding: The Role of Computational Thinking in Physics Education

Asep Irvan Irvani
Universitas Pendidikan Indonesia, Indonesia

Parlindungan Sinaga
Universitas Pendidikan Indonesia, Indonesia

Endi Suhendi
Universitas Pendidikan Indonesia, Indonesia

Lilik Hasanah
Universitas Pendidikan Indonesia, Indonesia

Siti Nurdianti Muhajir
Universitas Garut, Langensari, Indonesia

This study investigates the integration of computational thinking (CT) in physics education over the past two decades (2003–2023) through a systematic literature review (SLR) guided by the PRISMA methodology. A total of 188 peer-reviewed articles from Scopus and PubMed databases were analyzed, focusing on publication trends, thematic developments, and geographic contributions. Using bibliometric tools such as VOSviewer and R, the analysis identified three major research clusters: (1) CT-based instructional methods and their impact on student outcomes, (2) the role of computational tools and simulations in enhancing conceptual understanding, and (3) frameworks for assessing CT competencies in physics curricula. Results show a marked increase in CT-related publications after 2015, driven by global initiatives promoting STEM education, with significant contributions from North America, Europe, and an emerging presence from Asia. The findings underscore the transformative potential of CT in fostering interdisciplinary problem-solving skills and preparing students for challenges in technology-driven fields. This review highlights critical gaps in research, including a lack of standardized assessment methods and limited studies in diverse educational contexts, offering actionable insights for educators, researchers, and policymakers to advance CT integration in physics education.

Keywords: Bibliometric Analysis, Computational Thinking, Physics Education, SLR

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Digital Pedagogy in Teachers' Perspective

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Department of Social Science Education, Indonesia University of Education, Bandung, Indonesia

Teachers' perspectives on education policy are often overlooked. Their minimal involvement in the policy formulation process erodes the role of teachers as critical educational subjects. This article explores teachers' views, experiences, and challenges in implementing digital pedagogy. Using Paulo Freire's essential idea of education that emphasizes critical awareness, we are interested in uncovering how the integration of digital technology in the education process has placed teachers in a difficult and constrained position between the demands of mastering digital competencies and the obstacles they face in schools. This article uses qualitative research based on a literature review that analyzes 12 scientific articles and research reports related to digital pedagogy from 2020 to 2024. The research findings show that the COVID-19 pandemic has accelerated the need for digitalization in the world of education (digital pedagogy). Teachers who are required to master digital technology briefly experience obstacles and limitations, such as social conditions, availability of infrastructure, support from school institutions, and lack of teacher training. As a result, technology only plays a role as an administrative tool that encourages uniformity, instead of supporting the innovation and critical engagement needed in education.

Keywords: Digital Education, Critical Pedagogy, Educator Involvement

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Self-Efficacy in Speaking of ESL Students in Hyflex Classroom

Rizal Dapat
Adamson University, Manila, Philippines

Pamela Mantuhac
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English proficiency has become indispensable for success in today's globalized world, be it in pursuing further education, a career, or just getting by in life. Among English as a Second Language or ESL learners, this has become more challenging especially in a HyFlex learning contexts, where technology and other forms of communication are heavily integrated. Thus, this study aims to assess the self-efficacy of ESL students in speaking English in a Hyflex classroom setting, considering factors like communication mode, technological competence, feedback reception, participation level, confidence, and self-regulation. The research used a mixed-method approach, using a structured survey and semi-structured interviews with English teachers. The findings reveal a multifaceted nature of speaking proficiency among ESL students, with factors like communication mode, technological competence, feedback reception, participation level, confidence, and self-regulation playing significant roles. The study also reveals challenges faced by ESL students, such as linguistic barriers, insufficient confidence, technical difficulties, and limited interaction opportunities. In response, teachers employ techniques like oral exercises and interactive tasks to enhance students' confidence and self-assurance. The study highlights the need for personalized support, tailored methods to address individual difficulties, and teachers' strategies to enhance students' confidence in speaking.

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Advancing Lexical Enrichment and Linguistic Competence Through Technological Innovations

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The integration of technological innovations presents a multifaceted array of authentic, contextually enriched opportunities for both deliberate and incidental vocabulary acquisition. Among these innovations, Online Mobile Dictionaries (OMDs) emerge as indispensable tools, facilitating not only the profound comprehension and pragmatic application of lexical items but also offering insights into their etymological roots and nuanced contextual usages. This study endeavors to critically examine the influence of OMDs on vocabulary development through a methodologically rigorous approach. To achieve this objective, experimental and control groups were meticulously structured, and participants were subjected to comprehensive pre- and post-intervention assessments. Additionally, a systematically developed questionnaire was employed to collect quantitative data, enabling an in-depth analysis of students' perceptions regarding the integration of OMDs into language instruction. The findings unequivocally demonstrate that incorporating OMDs into language pedagogy yields substantial advantages, including enhanced competence in analyzing derivational and inflectional aspects of vocabulary and significant advancements in phonological awareness. Furthermore, the study highlights the pedagogical efficacy of combining semantic mapping strategies with the use of OMDs, positing this integrated approach as a robust mechanism for reinforcing lexical knowledge. This synergistic methodology proves particularly effective within Blended Learning environments, fostering learner autonomy and cultivating a more nuanced and sophisticated understanding of linguistic structures. As posited by Holec (1981), the cultivation of learner autonomy empowers language learners to strategically plan, monitor, and evaluate their progress, while adapting learning strategies and styles to align with their individual abilities and interests. This paper thus provides a comprehensive theoretical framework for independent learning and delivers empirical evidence on the practical application of autonomous learning principles in routine language acquisition practices.

Keywords: Collocation, Lexical Entries, Online Mobile Dictionaries, Semantic Mapping, Vocabulary Acquisition

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Changing Aspects in E-Classroom and The Teachers' Experiences: A Boost in Management Program

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E-classroom is the new trend while other schools are still adopting the traditional way of promoting learning among learners. Designed to facilitate students' learning, simulated circumstances in most activities in e-classrooms will definitely help the learners to apply them in real life. In public elementary schools, each e-classroom is assigned with one (1) ICT coordinator. Its regulation is dependent on each school and the principal plays a vital role in implementing them. The researcher observed that most of the teachers preferred to use printed modules rather than having online instructions because they have difficulty in preparing their instructional materials using the computer and it follows that not all can use the e-classroom. The researcher further experienced difficulty in using the e-classroom because of the lack of training and exposure to technology and the learners can only do so much with technology like playing video games rather than using Microsoft applications like Word, Excel, PowerPoint and many others. Through mixed method research design, the results of the current study can be deduced that e-classroom could potentially shape the future of education by advancing the traditional classroom setting into the web. The use of e-classroom has dramatically increased over the years as teachers perceived its usefulness and felt the impact of e-classroom to their teaching methodologies and learning styles. Although there are some hurdles along the way, but through strategizing e-classroom approaches, things can be addressed and e-classroom utilization and management can optimally benefit teachers and learners. Therefore, there is a need for the entire academic community to ensure that the factors of e-classroom effectiveness are delivered adequately and the utilization of e-classrooms must be evaluated regularly. Thus, e-classrooms offer a range of advantages that make them equally important in today's educational landscape.

Keywords: e-Classroom, Teacher Experiences, e-Classroom Utilization and Management, Digital Technology, Teaching and Learning

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Optimizing the Integration of Mobile Applications in the Training of Future Physical Education Teachers

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This research aims to improve the teaching methods of future physical education teachers by integrating mobile applications into the educational process. The study explores how mobile technologies can enhance teaching effectiveness by promoting more interactive and engaging learning experiences. Mobile applications provide teachers with opportunities to expand their knowledge, access teaching resources, and stay updated on the latest pedagogical trends, all of which contribute to more dynamic lesson delivery. These tools also facilitate better communication between teachers and students, fostering a more collaborative and supportive learning environment. By leveraging mobile technologies, teachers can personalize learning experiences, offer real-time feedback, and create interactive lessons that keep students motivated and involved. Moreover, mobile applications help in tracking student progress, enabling teachers to tailor their approach based on individual needs. Through successful case studies and innovative teaching strategies, the research highlights how these applications can revolutionize physical education instruction, making it more efficient and student-centered. Ultimately, the integration of mobile applications not only improves teaching practices but also enhances student engagement, making the learning process more enjoyable and effective.

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Readiness on eLearning among Accountancy Students in Accounting Information System: A Flexible Learning in the New Normal

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With the outbreak of coronavirus (COVID-19) throughout the world, it brought impacts and challenges on education response to ensure learning continuity. But there is a scant research literature on flexible pedagogical strategies in the new normal. Thus, this study investigated the readiness in eLearning among Accountancy Students in Accounting Information System during Covid-19 pandemic. This study employed a quantitative-descriptive research. It used a purposive sampling technique among chosen 54 Filipino accounting students as target respondents. It used SPSS for statistical analysis of the data. It used SPSS for statistical analysis of the data. This study used self-made questionnaires: Readiness on eLearning among Accountancy Students in Accounting Information System (ReLAIS), a 20-item Likert Scale. Findings of the study revealed that accountancy students were highly confident in applying and observing online netiquettes but less confident in having a strong internet connectivity during accounting classes and engaging themselves in online discussion. This study suggested the use of asynchronous learning modality to benefit students having problems on internet connectivity and to engage students in virtual classroom discussion.

Keywords: Online Learning Materials, COVID-19, Accountancy Students, Accounting Information System, Internet Connectivity

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Dictator for a Day; Utilizing the MDA Framework Aligned With "Backwards by Design" Planning to Create Immersive Learning Experiences

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Over the past several decades, Game-Based Learning (GBL) and gamification have been extensively explored as pedagogical strategies to enhance student engagement and learning outcomes (Corbeil, 1999; Yeigh et al., 2017). Contemporary educational practices increasingly integrate principles of game design with established pedagogical frameworks, fostering deeper student engagement, personalised inquiry-based learning, and mastery of curriculum objectives (De Troyer, Van Broeckhoven, & Vlieghe, 2017; Kacmaz & Dubé, 2022). At Aoba-Japan International School (AJIS), educators have implemented GBL within middle and high school curricula using the video game *Minecraft* as a medium for teaching governance systems and exploring the sociopolitical dynamics that shape societal structures.

This initiative employed a collaborative instructional design approach, aligning the *Backwards by Design* framework (Wiggins & McTighe, 2005) with the Mechanics, Dynamics, and Aesthetics (MDA) framework (Hunicke, LeBlanc, & Zubek, 2004). By integrating these models with inquiry-based learning, the project facilitated meaningful learning experiences, enabling students to connect their in-game interactions to historical and political events. The interactive nature of the learning environment fostered intrinsic motivation, aligning with the continuum of self-determination (Gagné & Deci, 2005) and encouraging critical thinking, reflection, and deeper conceptual understanding.

The study incorporated well-defined learning objectives, scaffolding techniques through guided gameplay, and alignment of pedagogical approaches with game design principles. This study employs a mixed-methods approach including student surveys and teacher observations. To assess the effectiveness of this instructional model, data were collected through observational analysis, student reflections, and comparative assessments. The findings underscore the transformative potential of integrating GBL with evidence-based pedagogical strategies, offering insights into the design of immersive and impactful educational experiences.

Keywords: Online Learning Materials, COVID-19, Accountancy Students, Accounting Information System, Internet Connectivity

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Transformational Leadership of Middle Management and Teacher Commitment Toward Enhanced Faculty Leadership Program

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This study investigates the relationship between transformational leadership and teacher commitment in educational institutions in Manila and Pasay City, Philippines. Employing a descriptive-quantitative and comparative correlational design, the research utilizes a validated researcher-made questionnaire distributed to 133 teachers holding middle management positions in four schools. The study identifies key factors influencing teacher commitment—workload, salary, administrative support, and work environment—and examines the impact of transformational leadership styles, including Inspirational Motivation, Individualized Consideration, Intellectual Stimulation, and Idealized Influence, on teacher commitment. Multiple regression analysis is used to determine the significance of these leadership styles on teacher commitment. The findings reveal a strong positive relationship between transformational leadership components and teacher commitment, with Inspirational Motivation emerging as the most potent predictor. Based on these results, the study proposes a Faculty Leadership Training Program, emphasizing these leadership styles to enhance teacher commitment and job satisfaction. The research contributes to understanding the role of transformational leadership in fostering teacher commitment, offering insights for educational leaders and policy makers to improve teacher retention and educational outcomes.

Keywords: Transformational Leadership, Inspirational Motivation, Individualized Consideration, Intellectual Stimulation, Idealized Influence

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Navigating Hidden Paths: Motivations, Risks, and Opportunities in Online and Underground Schools for Girls in Afghanistan

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Research Objectives: This study aims to explore the motivations, risks, and opportunities associated with online and underground schools for girls in Afghanistan, focusing on the perspectives of administrators, teachers, and students. The research seeks to understand how these alternative educational settings—often conducted in private homes, madrassas, or informal spaces—navigate the complex socio-political landscape to provide education to girls after the secondary education ban in Afghanistan (from August, 2021).

Analytical Method: The authors have used qualitative research through conducting semi-structured interviews with administrators, teachers, and students of online and underground schools in Afghanistan. The interviewees were chosen with different roles and responsibilities to investigate the situation from different perspectives. This research has used thematic analysis (inductive approach) to do an in-depth analysis of the interviews.

Data Sources: The authors have conducted interviews with 23 participants. Sixteen of them were administrators, teachers, and students of four online schools and the rest of the seven participants were from underground schools in Afghanistan.

Results and Conclusion: The findings from the interviews conducted with participants in this study reveal a redefined understanding of education in the context of Afghanistan's socio-political environment. Despite the absence of formal certification, accreditation, or immediate job prospects, education is perceived as a critical tool for empowerment, one worth the risk to personal safety and security. Participants consistently emphasized the intrinsic value of education, seeing it as essential to preventing illiteracy and maintaining a sense of agency in a challenging environment. Additionally, the data highlights the significant role of resilience and a deep sense of duty among the Afghan diaspora, with many expressing a strong commitment to supporting educational initiatives for girls in Afghanistan. This study underscores the notion that, in an increasingly interconnected world, education cannot be fully suppressed. Through creative and adaptive use of technology, individuals and communities are finding innovative ways to circumvent barriers, ensuring that girls in Afghanistan continue to access educational opportunities despite the ongoing restrictions.

Significance of the Study: The significance of this study lies in its potential to deepen our understanding of how girls' education can continue in environments where it is severely restricted. It can inform policy, support advocacy efforts, highlight the resilience of educators and students, and contribute to the broader discourse on education in crisis contexts. The findings could ultimately guide strategies to ensure that education remains accessible, secure, and meaningful for girls even in the face of significant socio-political challenges. Moreover, this study can contribute to global educational research in conflict zones, highlighting the role of technology in education, expand the limited reseach conducted in gender and education in crisis context, and inform policy for further steps to take in order to make education accessible to girls in Afghanistan.

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Alternative Assessment Techniques and the Role of AI in Enhancing Critical Thinking in Philosophy and Contemporary Issues Courses

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This study explores *The Mind*, an innovative assessment framework designed to enhance critical thinking in Philosophy and Contemporary Issues (FIS) courses. The framework incorporates two alternative assessment techniques: *Role Play* and *e-Poster*. These techniques aim to address the limitations of traditional assessments by fostering deeper engagement and understanding of philosophical concepts. Additionally, the integration of Artificial Intelligence (AI) tools, such as ChatGPT and Canva, supports students in developing creativity, digital literacy, and problem-solving skills. Data collected from 122 university students revealed that 71.3% found *Role Play* improved their ability to apply philosophical theories, while 65.6% successfully connected abstract concepts to real-world issues through *e-Poster* assignments. AI tools enhanced collaboration and provided personalized feedback, enabling iterative learning. However, challenges remain in consistently linking theoretical knowledge with practical applications. The findings align with the objectives of the Future-Ready Curriculum and underscore the need for innovative pedagogical practices in the post-pandemic era. This paper concludes that *The Mind* framework is a scalable and transferable model for fostering critical thinking and creativity in higher education, with broader implications for curriculum design and policy. Recommendations include expanding the framework's application to other disciplines and providing structured training for educators to maximize its impact.

Keywords: Assessments Technique, Role of AI, Critical Thinking, Philosophy Course

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The Use of Design Applications as A Medium for Artistic Creation Virtually in The Fashion and Textile Design Department

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The world is currently entering the era of Society 5.0, where digitalization is advancing rapidly across various fields, and technological evolution is accelerating. Information, communication, interaction, sharing, and knowledge could now be accessed simply by holding a smartphone screen. Design creation also benefits from the available of smart technology. Based on a previous survey, nearly 60% of students in the fashion design department are not yet familiar with fashion design applications and rarely use them. The research method used in this study is qualitative research, involving descriptive data in the form of written and spoken language. Qualitative research is descriptive in nature and typically employs an inductive approach, emphasizing the process and meaning from the subject's perspective. The analysis applied is descriptive analysis, utilizing several methods such as interviews, literature reviews, and references from magazines, articles, studies, and books related to digital art. The purpose of this article is to discuss the role of technology, particularly the use of applications in the field of fashion design. Furthermore, this article explores several popular and commonly used applications in fashion design, such as *Tailornova, Pattern Design Software*, and *CLO 3D*. Finally, the article discusses online design businesses through applications like DressX, which could be accessed via smartphones. The conclusion of this article is that fashion design applications are one of the tools that could be utilized to design clothing in the fashion industry. These tools could influence creative and innovative design outcomes and the continuous development of digital design technology. It is hoped that this article encourages all Fashion and Textile Design students at university to leverage current technological advancements for academic and personal purposes.

Keywords: Applications, Digital, Fashion Design

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Harnessing Emerging Technologies for Achieving Sustainable Development Goals in Education: Opportunities and Challenges

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The incorporation of nascent technologies-encompassing artificial intelligence, blockchain, virtual reality, and the Internet of Things-within the educational domain is fundamentally transforming pedagogical frameworks and aiding in the realization of the United Nations Sustainable Development Goals (SDGs), with a particular emphasis on SDG 4: Quality Education. These advanced technologies augment accessibility, customize learning experiences, and enhance educational governance, thus mitigating discrepancies in educational access. AI-driven adaptive learning systems promote personalized instruction, whereas blockchain technology guarantees the integrity and authenticity of academic credentials. Virtual reality and augmented reality create immersive educational contexts, offering significant advantages to marginalized and geographically isolated learners. Furthermore, the Internet of Things (IoT) streamlines resource distribution and classroom oversight. Nonetheless, obstacles such as the digital divide, concerns regarding data privacy, and the necessity for policy reform must be surmounted to fully exploit the potential of these technological advancements. This scholarly paper investigates the capacity of emerging technologies to propel sustainable educational reform, ensuring inclusivity, equity, and the provision of lifelong learning opportunities.

Keywords: Emerging technologies, Sustainable Development Goals (SDGs), Quality education (SDG 4), Artificial intelligence (AI), Blockchain, Virtual reality (VR), Internet of Things (IoT), Digital divide, Educational equity, Lifelong learning

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Empowering Entrepreneurial Mindsets: Exploring Vocational Science Teachers' Experiences in Student Skill Enhancement

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Entrepreneurial mindset can be cultivated through the enhancement of both creative thinking skills and entrepreneurial thinking. These skills play a crucial role in preparing students to become innovative and adaptive individuals in the workforce. This study aims to explore how vocational science teachers in West Java implement learning approaches that foster the entrepreneurial mindset in students. A survey was conducted with 30 vocational science teachers from various schools across West Java, selected using random sampling to gather data on their teaching methods. Data analysis was performed using percentage-based calculations to assess the extent to which the identified teaching methods were implemented across the sample. The findings reveal that 53.33% of the teachers have already incorporated creative thinking skills into their teaching methods, while 63.33% of them have introduced entrepreneurial thinking-based approaches in their classrooms. In conclusion, although a significant number of teachers have begun to adopt practices that encourage both creative and entrepreneurial thinking, there is still room for improvement to ensure that all students benefit from these essential skills. The study suggests that further training and support for teachers could enhance the development of entrepreneurial mindset in vocational education, ultimately contributing to student success in the modern job market.

Keywords: Entrepreneurial Mindset, Creative Thinking Skill, Entrepreneurial Thinking, Science in Vocational School

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E-Learning: The Effectiveness of Bebestory's Interactive Storybooks in Influencing Reading Interest

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Surveillance Along with the development of technology, Bebestory interactive picture storybooks have been introduced as an innovation by combining visual elements and activities that can engage children more deeply during the reading process and not only offer interesting stories but also invite children to interact with the content through sound and moving images with simple animation. This study examines the impact of using Bebestory interactive picture storybooks in increasing the reading interest of primary school students in Remote and Isolated Villages. The research approach used is quantitative with a pre-experimental research design with the type of one-group pretest-posttest design. This research model consists of only one group. This study used 82 student respondents in phases A to C at Melidi State Elementary School which is a remote and isolated village. The data analysis used was descriptive statistics and inferential statistics. Hypothesis testing using paired sample t test and N-Gain test. The results showed a significant increase in students' interest in reading. Bebestory interactive picture storybooks are more effective as evidenced by high post-test scores and N-Gain scores. This study concludes that Bebestory interactive picture storybooks significantly increase students' interest in reading.

Keywords: E-Learning, Interactive Storybooks, Reading, Interest

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Investigating Students' Mathematical Literacy Performance in PISA Questions: Information Processing Theory

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The theory of information processing examines how individuals process information in their minds, which is essential for students in solving problems, including PISA tasks. This study explores students' mathematical performance in solving PISA tasks through the lens of information processing theory. A qualitative approach was employed, involving three research subjects with varying levels of mathematical literacy: level 2 (low), level 3 (medium), and level 5 (high). Data were collected through task analysis and semi-structured interviews. The analysis involved data reduction, presentation, and conclusion drawing. The study adopted the Atkinson-Shiffrin information processing model, which comprises sensory register, working (short-term) memory, and long-term memory. Cognitive processes analyzed included attention, perception, rehearsal, retrieval, and coding. The findings revealed that cognitive processes occurred at all students, but their effectiveness varied by task complexity. Level 2 students exhibited cognitive processes primarily in problems characterized by the use of basic arithmetic calculations. The cognitive difficulties encountered by these students occurred during the attention phase, where they struggled to comprehend problems involving models, resulting in errors during the encoding process. Level 3 students demonstrated cognitive processing in problems characterized by the use of explicit models. Cognitive challenges included issues in the attention phase, as students had difficulty understanding problems with complex characteristics, disruptions in the perception phase, where they experienced cognitive lapses in concept application, and obstacles in the encoding process. Level 5 students engaged in cognitive processing for problems of higher complexity, but faced challenges with tasks requiring mathematical model development and implicit concept integration. These findings indicate the necessity for collaborative learning in classrooms to accommodate diverse cognitive abilities, bridging differences, fostering interaction, and encouraging peer support, leading effectively foster and improve students' problem-solving abilities.

Keywords: Cognitive Processes, Mathematical Performance, Literacy Skill Level, PISA Questions, Information Processing Theory

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Factors Influencing Students' Academic Performance at Arab Open University: The Case of Oman

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Students are an important asset for higher education institutions, and it is crucial to increase student retention and reduce dropout. Low academic performance and high dropout rates are complex and multi-faceted problems that have far-reaching implications for all stakeholders, including society, educational institutions, government, and, most importantly, the economy. The purpose of this study is to identify factors that affect academic performance at Arab Open University, Oman. The study distributed an online questionnaire to students and collected 516 samples. Key factors identified include teaching methods, family income and support, time and stress management, attendance, ethnicity, past academic performance, continuous assessment grades, e-learning activities, and accommodation. The findings reveal strong positive correlations between teaching methods, attendance, and continuous assessment grades with students' Grade Point Average (GPA) across various GPA categories. Time management and e-learning activities show significant impacts in specific GPA ranges. Other factors such as ethnicity, past grades, and accommodation demonstrate varying levels of influence, while family income exhibits a weaker correlation. The study emphasizes the importance of these factors in guiding educators and policymakers to enhance academic outcomes by prioritizing interventions in areas with the greatest impact.

Keywords: Students' Academic Performance, Higher Education, Factors, Dropout, GPA

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Evaluation of the Research Structure and Development of Research Competencies in Economic Engineering Students

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The objective of the study was to analyze the relationship between the evaluation of the research structure and the development of research competencies in Economic Engineering students of a public university. For this purpose, a quantitative methodology with a non-experimental design was used, taking as a sample 60 students enrolled in the Research Methodology course of said course. The analysis of the data showed that students with a higher level of evaluation of the research structure also obtain better results in the development of research competencies. This indicates that the ability to analyze and understand the organization of scientific studies directly influences the strengthening of essential research skills, such as problem formulation, argumentation and academic writing. Likewise, the findings reinforce the importance of promoting teaching strategies that foster a detailed evaluation of previous research, allowing students to improve their analytical judgment and apply this knowledge in their own research. Consequently, it is concluded that a higher level of evaluation of the research structure leads to a stronger development of research competencies, which in turn positively impacts the quality and depth of the academic work produced by students.

Keywords: Evaluation, Research Competencies, Structure, Methodology, Analysis

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Weighted Energy Efficient Clustering and Routing Optimizaiton for Provisioning Time-Driven IoT Application using Wireless Sensor Networks

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Wireless Sensor Networks (WSNs) play a crucial role in next-generation real-time data access for the Internet of Things (IoT) application. These applications demand realistic communication ensuring higher energy efficiency and less latency while accommodating the heterogeneity of network environments. However, achieving real-time communication with minimal delay often results in significant energy consumption among sensor nodes. Clustering techniques have been widely adopted to reduce energy consumption, yet they introduce additional energy burdens on cluster heads and sensor nodes near the sink. To mitigate this challenge, numerous optimization approaches have been proposed for efficient cluster formation. However, most existing techniques are designed with a homogeneous network assumption with static cluster head (CH) selection scenarios, limiting their adaptability to real-world heterogeneous IoT-WSNs. This work introduces weighted energy efficient clustering and routing optimization (WEECRO) strategy which ensures lesser delay and energy consumption meeting time-driven IoT application quality requirements. The WEECRO is very efficient in improving network lifetime and reducing the number of hop required ensuring lesser delay in comparison standard models.

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Efficient CNN Design and Implementation on FPGAs: A Modular Architecture for Enhanced Performance

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Convolutional Neural Networks (CNNs) are widely used in deep learning for tasks like image recognition, classification, and segmentation. Their layered architecture enables effective feature extraction from visual data. While GPUs are the dominant choice for high-performance computing, Field-Programmable Gate Arrays (FPGAs) provide an alternative due to their lower power consumption, flexibility, and cost-effectiveness.

This paper explores the integration of CNNs with FPGA-based hardware, leveraging the strengths of both technologies to achieve efficient, high-performance neural network implementations. This is particularly useful in real-time applications requiring low latency and optimized resource utilization. However, challenges such as efficient mapping of CNNs to FPGA resources, optimizing parallelism, and managing hardware complexity must be addressed.

This work presents a modular architecture for CNN implementation on FPGAs, designed to minimize latency, reduce resource usage, and enhance flexibility. While existing research, such as “Methodology for CNN Implementation in FPGA-Based Embedded Systems,” provides foundational insights, this paper proposes a distinct approach by introducing a high-level design methodology and modular FPGA implementation. The effectiveness of this approach is demonstrated through optimized CNN architectures that improve computational efficiency and adaptability for various applications.

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Efficient Optimization Smart Energy Meter using FFT

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This paper aims to explore the use of Fast Fourier Transform analysis in optimizing energy consumption in energy management systems. The FFT transforms time-domain energy signals into the frequency domain for easy determination of consumption patterns, trends, and areas of potential issues more promptly than other methods. In this study, data from smart meters were analyzed to determine the effectiveness of this approach in streamlining efficiency in energy use. The findings revealed that FFT analysis can be used to understand energy consumption and could easily identify areas with inefficiencies that can be optimized through energy consumption. This method proved effective in minimizing wastage of energy and increasing the overall efficiency of the system. Adding FFT-based analysis into energy management systems will help save lots of energy along with the improvement in operation. Hence, this becomes a highly useful tool to optimize the utilization of energy within the modern system.

Keywords: Smart Energy Meter, IoT, Wi-Fi Module, Prepaid Billing, Postpaid Billing, ESP8266, Energy Management

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Video Lessons in Algebra Anchored on Learners' Lived Experiences in an Online Tutorial Program

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This exploratory-sequential mixed-method design study aimed to describe the lived experiences of tutees and identify the best features of the online tutorial program as basis for the development of video lessons in algebra. It has two phases; Phase 1 – was a phenomenological study that describes students' lived experience in their online tutorial program and identifies the best features of the program; Phase 2 – was the development of the video lessons. Various tools were utilized such as open-ended interview guides, screen shots of tutorial recordings, and researcher-made rating sheets to obtain the qualitative and quantitative data in the study. Phase 1 of the study revealed that the best features of the online tutorial program were: Clear Delivery of Module-Related Lesson; Repetition of Concepts and Gradual Release of Assistance; Appropriate Pacing; Immediate Feedbacking; and Translation to dialect. These identified key features were utilized for the development of the videos. A total of six videos were developed and evaluated by math experts. Findings of Phase 2 revealed that students and teachers have a very high approval level of the developed videos. Therefore, the set of videos can be used by students and teachers for their 1st quarter lesson, specifically, on Rational Algebraic Expressions. It is recommended that the effectiveness of video lessons be tested to determine if these sets of videos can also improve a student's performance.

Keywords: Lived Experience, Tutorial, Video Lessons

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Exploring the Effectiveness of Integrating Working Memory Training Strategies with English Language Learning

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This study investigates the integration of working memory training strategies with English grammar learning by leveraging the visual programming language platform Scratch to design interactive educational games. The games are developed to combine cognitive skill enhancement with language acquisition. A total of 100 to 150 middle school students will participate, representing a critical age group for cognitive and linguistic development. Participants will be randomly assigned to one of three groups: two experimental groups receiving either complex span training or updating training, and a control group following traditional instructional methods that lack specific cognitive training components.

The intervention spans 6 to 8 weeks, consisting of weekly 30-minute sessions delivered via iPads or computers. Pre- and post-intervention assessments will evaluate improvements in working memory capacity and English grammar performance, focusing on specific grammar structures tailored to the curriculum. By exploring the effects of integrating cognitive training into language learning, this research aims to provide evidence-based recommendations for enhancing working memory training's role in improving learning outcomes and promoting more effective language education practices.

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Integrating Tradition and Technology: Interactive Web Integration Design for Sociology Learning as Cultural Transmission in Indonesian Senior High Schools

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Digital transformation in the era of Society 5.0 demands innovative educational approaches that bridge traditional learning with technological interventions. This study using Design-Based Research (DBR) to investigates the development of an interactive web-based platform for sociology learning as a mechanism for cultural transmission in Indonesian senior high schools. The study aims to explores the integration of tradition and technology in the design of interactive web-based tools for Sociology learning in Indonesian senior high school. The research employed a comprehensive DBR methodology involving five iterative phases: preliminary analysis, prototype design, initial implementation, systematic analysis, and continuous refinement. The interactive web platform was systematically developed, integrating traditional sociological concepts with digital learning tools. Data collection methods included mixed-method approaches: structured observations, in-depth interviews, performance assessments, and web interaction analytics. Key findings revealed significant improvements in students' engagement, critical thinking skills, and cultural comprehension. By demonstrating the potential of interactive digital platforms in cultural knowledge transmission, the research provides valuable insights for educators and policymakers in navigating technological innovations in learning environments.

Keywords: Cultural Transmission, Sociology Education, Technology Integration, Web-Based Learning

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Expected Future Civic Engagement: Navigating Citizenship Norms and Good Citizen Practices in the Digital Era

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The expected future citizenship engagement among Indonesian university students, focusing on citizenship norms and good citizenship practices in the digital age. Based on the Theory of Planned Behavior, which links attitudes to behavior through intentions, this study examines how university students' attitudes, subjective norms, and intentions shape citizenship engagement focusing on conventional engagement, social issues, and digital activities. A mixed-method approach was used, with a quantitative survey to measure students' attitudes, subjective norms, and intentions toward various forms of citizenship engagement, and qualitative interviews to explore their motivations, barriers, and perceptions toward citizenship in the digital age. The results show that although university students have intentions to engage in conventional citizenship activities, they are more interested in non-conventional engagement based on social issues and digital platforms. Media environment factors, social group influences, and citizenship norm expectations influence the formation of their intentions. The findings recommend reforms in citizenship education to enhance the development of digital skills and critical awareness of citizenship in the modern context. This study provides new perspectives on how young people interpret and project future citizenship engagement, and adds to the literature on citizenship in the digital age.

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Integrating Economic Civics in Citizenship Education as an Effort to Build Digital Economic Awareness in the Era of Digital Transformation

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Digital transformation has brought significant changes in various aspects of life, including the economic sector. This change requires every individual to have high digital economic awareness in order to be able to adapt and participate actively in the digital ecosystem. This research aims to examine how the integration of civic economics in citizenship education can be an effective strategy in building digital economic awareness in the younger generation. The research method used is a qualitative approach with descriptive analysis, through literature studies and in-depth interviews with educators and educational technology practitioners. The research results show that strengthening economic citizenship through citizenship education is able to increase students' understanding of their rights, obligations and responsibilities in the context of the digital economy. This integration also encourages the development of digital literacy, technology-based financial management skills, and awareness of digital ethics. These findings recommend the development of a citizenship curriculum that includes economic civics material, teacher training, and the use of educational technology as a learning medium. Thus, economic civic integration not only increases awareness of the digital economy, but also forms citizens who are intelligent, responsible and ready to face economic challenges in the era of digital transformation.

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Ecological Citizenship: Griya Luhu, Digital Waste Bank-based Waste Empowerment

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Data from the Ministry of Environment and Forestry of the Republic of Indonesia in 2018, cited from a study by Jenna Jambeck, a researcher from the University of Georgia, ranks Indonesia as the second-largest contributor of marine waste after China. This aligns with the findings of Indonesia's Central Statistics Agency (BPS) in 2018, which reported that 72 percent of Indonesians are indifferent to plastic waste. The study highlighted environmentally unfriendly behaviors, including 76.1% of individuals not sorting waste, 38.2% burning plastic waste, and 15.8% improperly disposing of household waste. These figures indicate a low level of public awareness regarding environmental issues. Marpaung (2022, p. 49) identified three main factors contributing to this indifference, one of which is the lack of infrastructure, such as the use of technology in waste management. This study aims to explore strategic efforts to develop ecological citizenship character through the use of the "Griya Luhu" waste bank application. The research employs a qualitative approach using ethnographic techniques. Data were collected through semi-structured interviews, observations, and documentation within the Griya Luhu community. The findings reveal that technology-based waste management, combined with rewards, is highly effective in increasing public awareness of waste management.

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Research Proposal: Mental Health of Refusing Rohingya

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The Rohingya, a stateless Muslim minority from Myanmar's Rakhine State, have endured decades of persecution and violence, resulting in their mass displacement to neighboring countries. The refusal of Myanmar to grant them citizenship and the hesitancy of host nations to provide them with permanent asylum have left the Rohingya in a state of perpetual statelessness. As a result, hundreds of thousands of Rohingya now reside in refugee camps, primarily in Bangladesh and Malaysia, where they face dire living conditions, social exclusion, and limited access to healthcare, education, and employment.

This study explores the mental health issues faced by the refusing Rohingya, focusing on the psychological impacts of prolonged displacement and statelessness. Mental health disorders such as depression, anxiety, and post-traumatic stress disorder (PTSD) are prevalent in refugee populations, especially those subjected to severe trauma and marginalization. Despite the urgency of their situation, there is limited research on the mental health needs of the Rohingya, making this study vital for understanding and addressing their mental health challenges.

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Bibliometric Study of Research Related to Funding in AI-based Healthcare

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Advancements in artificial intelligence (AI) have significantly transformed the healthcare sector, improving diagnostics, treatment, patient care, and overall system efficiency. However, the successful integration of AI into healthcare requires substantial financial investments in research, innovation, infrastructure, and policy frameworks. This study conducts a bibliometric analysis to assess the funding landscape of AI-driven healthcare research. Utilizing data from the SCOPUS database, 401 documents were selected from an initial pool of 1,303 records. The results indicate a rapid increase in AI-related healthcare research publications over the past decade, with the United States, China, and India emerging as the top contributors. Collaborative research networks, particularly in Europe, play a crucial role in shaping the field. Key themes identified include telemedicine, digital health, and precision medicine, alongside emerging topics such as large language models and ethical considerations. These insights provide valuable guidance for stakeholders, funding agencies, and policymakers in shaping strategic funding decisions and fostering innovation in AI-powered healthcare solutions.

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Trends and Evolution in Cost Analysis and Financial Valuation in Healthcare Technologies: A Bibliometric Study

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This bibliometric study explores trends and thematic evolution in cost analysis and financial valuation in healthcare technologies, MedTech, and artificial intelligence (AI). Using Scopus, 252 documents were retrieved with keywords related to "cost analysis," "financial valuation," "healthcare," and "AI." After refining to 171 relevant studies, key terms, thematic clusters, and research trends were analyzed. Dominant terms such as "healthcare," "economic valuation," and "health insurance" have gained increasing prominence from 2012 to 2024, reflecting growing interest in economic assessments of healthcare innovations. Co-occurrence analysis identified two major research clusters: one integrating healthcare with economic valuation and cost analysis, and another linking contingent valuation with health insurance and willingness to pay. Thematic evolution reveals a transition from foundational theoretical studies (1996-2010) to practical applications (2011-2015) emphasizing cost analysis in decision-making. The period 2016-2025 marks a methodological convergence, integrating health insurance, contingent valuation, and economic valuation into comprehensive models addressing scalability and sustainability. Despite global research growth, ASEAN contributions remain limited, highlighting a regional gap. This study underscores the need to adapt global valuation methodologies for sustainable healthcare innovation, serving as a foundation for future research and collaboration.

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A Bibliometric Analysis of Artificial intelligence (AI) Adoption for Healthcare and Diagnosis

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Artificial intelligence (AI) has the potential to play a role in healthcare system improvement, increasing efficiency, and revolutionizing the healthcare industry by offering improved diagnoses, personalized treatment, and enhanced health administration abilities.

The purpose of this study is to introduce alternatives and a slightly projective view of the future for healthcare professional tools, such as artificial intelligence (AI) for healthcare and diagnosis. This study presents a bibliometric analysis of 270 research articles published between 2018 and 2024, focusing on AI adoption for healthcare and diagnosis. Using the Scopus database and bibliometric analysis software (Bibliometrix), we identified key trends in research, influential authors, journals, and institutions, and projected future research directions.

After running the bibliometric analysis, the results show that there is a growing interest in this field, with specific themes such as Artificial intelligence, Machine learning, Deep learning, Medical, and Natural language processing gaining prominence. Key institutions leading this research include Harvard Medical School, the University of Toronto, the National University of Singapore, and the University of Oxford. Co-authorship and collaboration networks highlight the importance of interdisciplinary and international partnerships in advancing AI adoption in healthcare. This analysis provides valuable insights into the current state and future trends of AI in healthcare, guiding researchers, practitioners, and policymakers in evidence-based decision-making.

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Stress and Welfare Assessment for the Livestock in Rural Areas by using IoT with Deep Learning and Neural Networks

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This research explores the application of deep learning algorithms to assess stress and welfare in livestock within rural areas. Livestock farming is a critical component of rural economies, yet stress and welfare issues can significantly impact animal health and productivity. Traditional methods of monitoring livestock welfare are often labor-intensive and subjective, leading to inconsistent and delayed responses to stress indicators. By leveraging advanced IoT devices and machine learning techniques, this study aims to provide a comprehensive understanding of livestock behavior and health, ultimately improving animal welfare and farm productivity. The integration of IoT devices, such as wearable sensors and environmental monitors, allows for real-time data collection on vital signs, behavior, and environmental conditions. Deep learning algorithms, including convolutional neural networks (CNNs) and recurrent neural networks (RNNs), are employed to analyze this data and identify patterns indicative of stress and welfare issues.

The findings demonstrate the potential of deep learning algorithms to revolutionize livestock welfare assessment in rural areas. The deep learning models achieved high accuracy in detecting stress-related behaviors and physiological changes in livestock, providing valuable insights into periods of high stress and correlating them with specific environmental and management factors. The study also highlights the significant impact of environmental conditions, such as extreme temperatures and poor ventilation, on livestock stress levels. By automating the monitoring process, farmers can receive real-time insights into animal health and take proactive measures to reduce stress. This research underscores the importance of integrating modern technology with traditional farming practices to enhance livestock welfare, leading to better productivity and economic outcomes for rural farmers.

Keywords: Livestock Welfare, Stress Assessment, Deep Learning, IoT, Rural Farming, Wearable Sensors, CNN, RNN, Environmental Monitoring, Animal Behaviour

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Reducing Write Latency in ETCD with More Effective Storage Systems

Raghavendra Prasad Yelisetty

Containers are fundamental elements for Kubernetes-based native applications. If we draw an analogy to Object-Oriented Programming (OOP) and Java, container images resemble classes, and containers act as objects. Kubernetes is an open-source system for orchestrating containers, automating tasks like deployment, scaling, and management. It provides a framework for running distributed systems and microservices, ensuring high availability and scalability. Kubernetes supports various container runtimes, such as Docker and rkt, and offers features like self-healing, resource allocation, and load balancing. It has broad community support and integrates with multiple cloud providers, being highly extensible through APIs and plugins. Kubernetes also supports functionalities like rollouts, rollbacks, and resource quotas, and includes network policies and secret management. It is widely used in production environments. ETCD, a distributed key-value store, is crucial for shared configuration and service discovery in distributed systems. It ensures reliability and scalability, maintaining consistency and availability through the Raft consensus protocol. ETCD also provides SSL/TLS encryption and authentication, real-time updates via watches, and integrates easily with a simple RESTful API. It supports transactions, conditional updates, snapshotting, and data compaction for efficient storage. Designed for fault tolerance and high performance, ETCD is commonly used in Kubernetes, Cloud Foundry, and other distributed systems. However, the current ETCD operations integrated with the Write-Ahead Log (WAL) experience performance limitations. This paper proposes integrating ETCD with LRU (Least Recently Used) caching techniques to improve write latency.

Keywords: Persistent Volumes, Persistent Volume Claims, Daemonsets, ETCD, Statefulsets, Secrets, LRU, LFU, MRU, Kubernetes (K8S), Pod, Deployments, WAL, configMaps

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Forecasting Air Quality Index Using Genetic Algorithm Enhanced Extreme Learning Machine

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Assessing air first-class is a necessary step for the authorities as its miles a chief public fitness problem. Air Quality Index measures air pleasant. Carbon Dioxide, Nitrogen Dioxide, Carbon Monoxide and so forth. Released via combustion of natural gasoline, coal and wooden, factories, cars etc. Various air pollution that purpose air pollutants. Air pollutants can cause critical ailments like lung and brain cancer. Diseases, or even result in dying. Machine gaining knowledge of algorithms assist decide the air fine index. Various studies are being conducted in this vicinity, but the effects are still inconclusive. The dataset is available at the Kaggle air first- rate tracking platform and is divided into: training and trying out. Machine mastering techniques used for this reason are Linear Regression, Decision Tree, Random Forest, Artificial Neural Network, and Support Vector Machine.

Keywords: Carbon Dioxide, Nitrogen Dioxide, Carbon Monoxide

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