IIIDENTEX 2026

INTERNATIONAL INNOVATION IN DENTISTRY EXHIBITION

IIIDentEx

7th International Invention and Innovation in Dentistry Exhibition

2026

PROGRAMME & ABSTRACT BOOK

18 May 2026

Dorsett Putrajaya, Malaysia

Proudly hosted by

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www.iiidentex.com

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UNIVERSITI TEKNOLOGI MARA

Faculty of Dentistry

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IIIDentEx2026

Transforming Knowledge through Innovation: Bridging Science, Technology, and Practice

Content

Welcome Message

IIIDentEx2026
International Invention & Innovation in Dentistry Exhibition

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AP Dr Mas Suryalis Ahmad
Dean, Faculty of Dentistry UiTM

السّلام عليكم

It's a pleasure to welcome you to the 7th International Invention & Innovation in Dentistry Exhibition (IIIDentEx) 2026, held on 18th May 2026 at Dorsett Putrajaya Hotel, Putrajaya.

As dentistry continues to evolve in an era driven by rapid technological advancement and scientific discovery, platforms such as IIIDentEx play an important role in shaping the future of our profession. This exhibition reflects our collective aspiration to cultivate innovation, encourage interdisciplinary collaboration, and translate knowledge into meaningful solutions that improve oral healthcare delivery and patient outcomes.

The theme for this year, "Transforming Knowledge through Innovation: Bridging Science, Technology, and Practice," highlights the importance of integrating research excellence with practical application. It reminds us that innovation is not merely about creating new technologies, but about transforming ideas into impactful advancements that benefit society.

IIIDentEx 2026 brings together a vibrant community of inventors, academicians, clinicians, students, and industry leaders from diverse backgrounds and institutions. I am confident that this gathering will foster productive discussions, inspire new partnerships, and create opportunities for future collaborations that will continue to elevate the field of dentistry both locally and internationally.

I would like to extend my sincere appreciation to the organising committee, collaborators, sponsors, and all participants for their dedication and contribution towards making this event a success. Your commitment and enthusiasm are truly commendable.

May this exhibition serve as a catalyst for creativity, discovery, and excellence in dental innovation. I wish all participants a meaningful and rewarding experience at IIIDentEx 2026.

Thank you, and I look forward to the exciting innovations that will be showcased throughout this event.

Welcome Message

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International Invention & Innovation in Dentistry Exhibition

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السّلام عليكم

Greetings to all colleagues, innovators, and friends in the dental community!

It is with great excitement and anticipation that I invite you to join us for the 7th International Invention & Innovation in Dentistry Exhibition (IIIDentEx) which will take place on 18th May 2026 at Dorsett Putrajaya,Malaysia.

This year, our theme — "Transforming Knowledge through Innovation: Bridging Science, Technology, and Practice" — reflects our shared commitment to turning research and ideas into tangible solutions that benefit patients, practitioners, and the profession at large.

IIIDentEx has always been more than an exhibition. It is a hub where scientists, technologists, clinicians, and entrepreneurs converge to share breakthroughs, explore collaborations, and inspire the next generation of innovators in dentistry. Whether you are showcasing your own creation, seeking cutting-edge solutions, or simply eager to learn from global leaders, this is the place to be.

We look forward to welcoming inventors, educators, researchers, and industry partners from around the world for a day of knowledge-sharing, networking, and discovery. On behalf of the organising committee, I warmly encourage you to mark your calendars and be part of this exciting journey. Together, let us push the boundaries of what dentistry can achieve.

See you at IIIDentEx 2026!

Dr Noor Nazahiah Bakri
Chairperson IIIDentEx 2026

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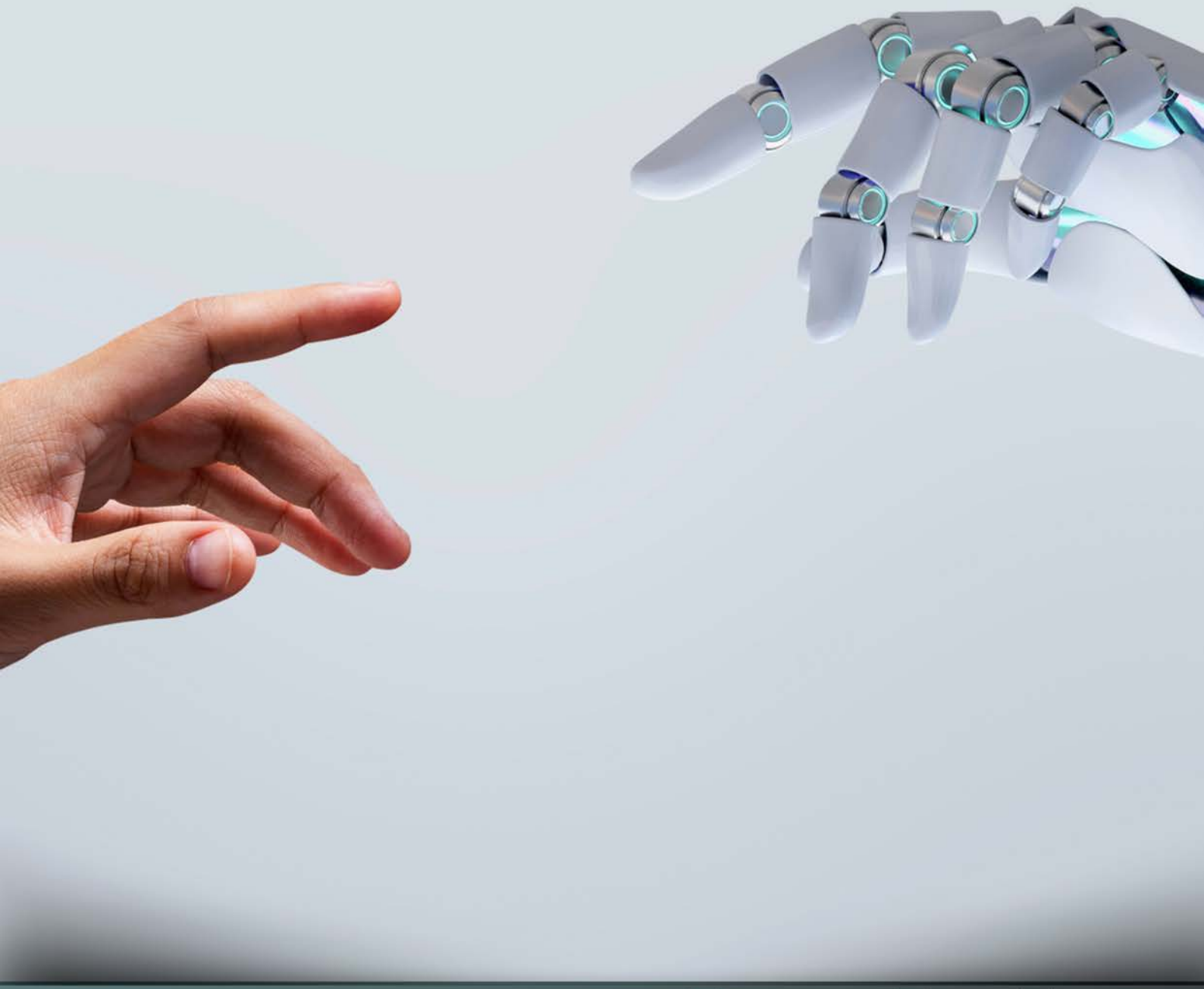
Our Past

- IIIDentEx -



insight

Organizing Committee

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Dr Noor Nazahiah Bakri
Chairperson

Dr Nawwal Alwani

Assoc. Prof.
Dr Norashikin

Prof. Dr Budi Aslinie

Dr Aza Fazura

Assoc. Prof
Dr Nik Mohd Mazuan

Dr Nor Faezah

Dr Diyana Shereen

Dr Azri Aliah

Dr Raja Nur Adilah

Prof. Dr Mohd Yusmiaidil

Dr Nor Hidayah

Dr Nurhanani

Dr Vinesh Raj

Dr Muhammad Alif Faiz

Assoc. Prof. Ts.
Dr Eddy

Matron Suzila Sukri

Puan Azrina Mokhtar

Puan Nor Fazillah

Puan Rabiatul Adawiyah

Student Committee

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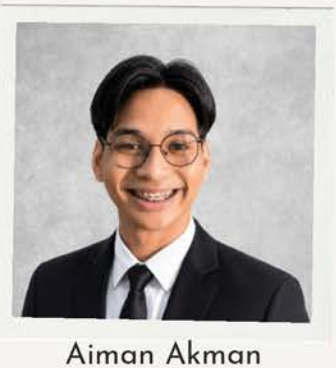
Adam Akmal


Haziq Harris


Aiman Akman


Ilham Mukhlis


Firdaus Al Hakim


Laila 'Amani

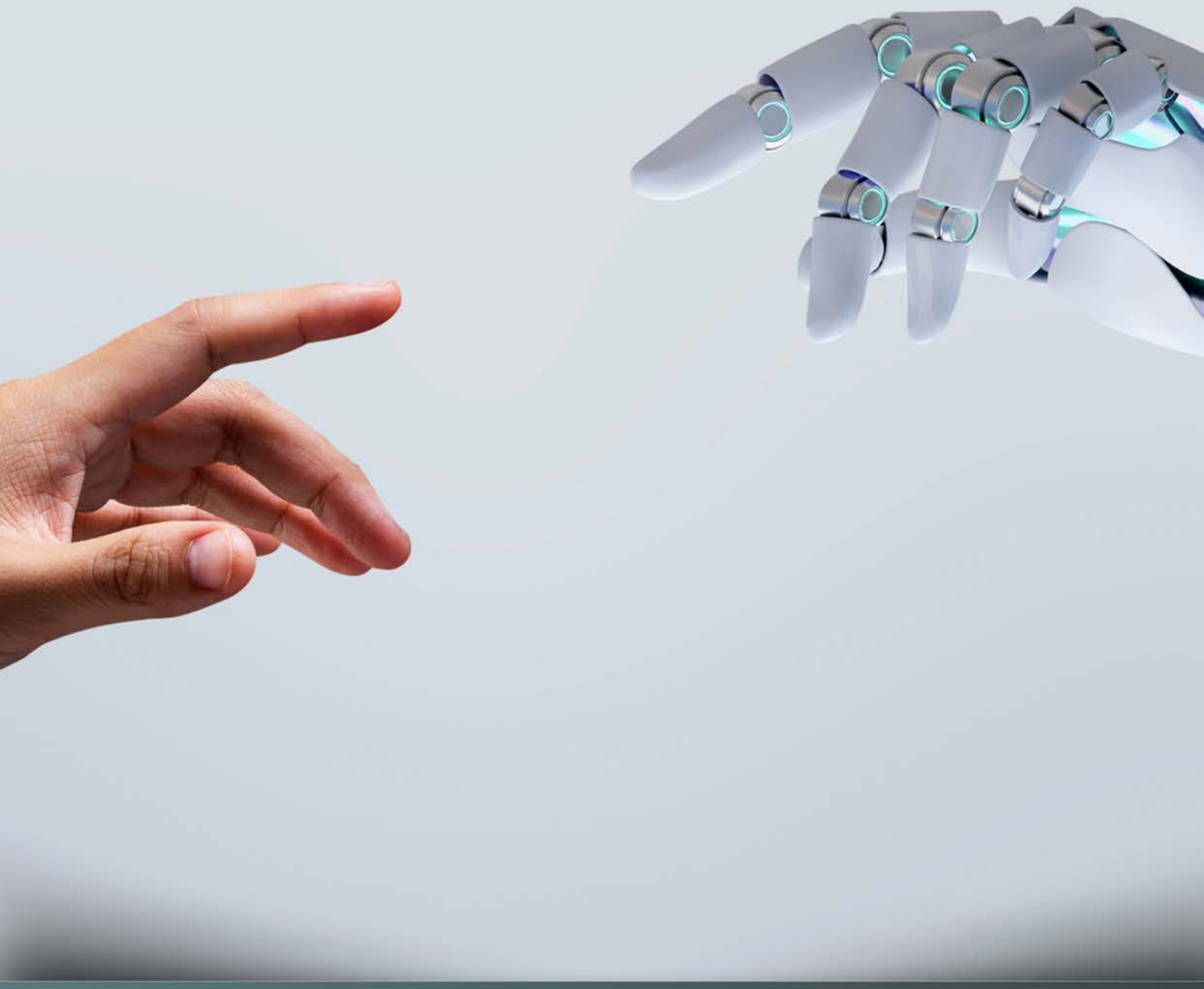

Zahirah Zamri


Jannah Roslee


Izzati Karmila


Asma Hashim


Aini Manan



schedule

Programme Schedule

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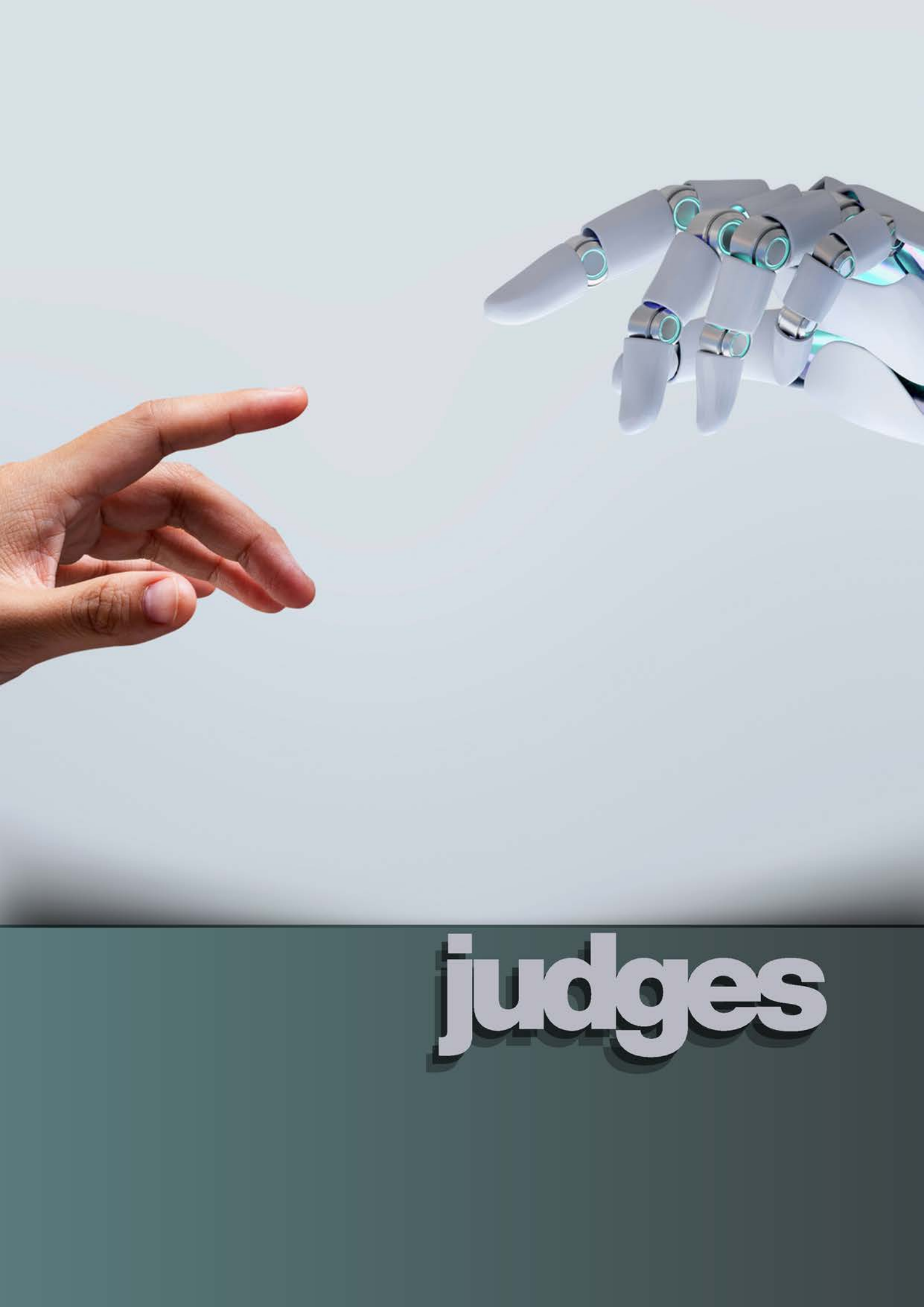
Time	Agenda
7.30 am - 9.00 am	**Registration & Booth Set up**
8.00 am - 9.00 am	**Morning Break**
9.00 am - 12.30 pm	**Judging Session**
12.00 pm - 2.00 pm	**Lunch Break**
2.00 pm - 2.40 pm	**Plenary Talk 1 : ChM Dr Mohd Azri bin Ab Rani** The Innovation Journey of Dr Azri's perfume : Translating Research to Market Success - RM5K To Million Revenue
2.40 pm - 3.20 pm	**Plenary Talk 2 : Mr Jason Low** Smarter Smile: Advancing Dental Learning Through Immersive Technology
3.20 pm - 3.40 pm	**Welcoming Remarks by IIIDentEx 2026:** • Chairperson (Dr Noor Nazahiah Bakri) • Deputy Dean for Students Affairs (Dr Nur Ain Ramlan) **Officiation & Closing** • Professor Dr Nor Azura Md Ghani (Director of Research Management Centre UiTM)
3.40 pm - 4.30 pm	**Announcement of Winner and Prize Giving Ceremony**
4.30 pm - 5.00 pm	**Adjourned**


judges

Meet Our Judges

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Professor Dato' Dr. Mohamed Ibrahim Bin Abu Hassan

Assoc. Prof. Dr Nor Amlizan Binti Ramli

Assoc. Prof. Dr Nuruliza Binti Roslan

Assoc. Prof. Dr Nur Hafizah Binti Kamar Affendi

Dr. Muhammad Hilmi Bin Zainal Ariffin

Dr Nur Fauziani Binti Zainul Abidin

Dr. Badrul Munir Bin Mohd Arif

Dr. Nurul 'Izzah binti Mohd Sarmin

Dr. Nurul Huda Hassan

Dr. Kavin Sothirasan

Dr. Zeefitri Saniah Binti Bidin

Miss Stephy Shim Man Xi


talk

Plenary Talk 1

The Innovation Journey of Dr Azri's Perfume: Translating Research to Market Success — from RM5K to Million Revenue

Speaker

ChM DR MOHD AZRI BIN AB RANI

Founder of Dr. Azri's Perfume

Chemistry Lecturer, Scientist, Founder & UiTM Athlete
Post-Doctoral, Kyoto University, Japan
Doctor of Philosophy, Imperial College London,UK
Master Science (Chemistry), Universiti Kebangsaan Malaysia
Bac. Science (Hons.) – Petroleum Chemistry, Universiti Putra Malaysia

This plenary talk shares the inspiring journey of transforming a research-based idea into a successful commercial brand. Beginning with an initial investment of RM5,000, Dr Azri's Perfume has grown into a million-revenue enterprise through innovation, strategic branding, perseverance, and market-driven thinking.

The session will explore the challenges and opportunities in translating research and creativity into commercially viable products, highlighting key lessons in entrepreneurship, product development, marketing, and business sustainability. Participants will gain valuable insights into bridging the gap between academia, innovation, and real-world market success.

Plenary Talk 2

Smarter Smiles: Advancing Dental Learning through Immersive Technology

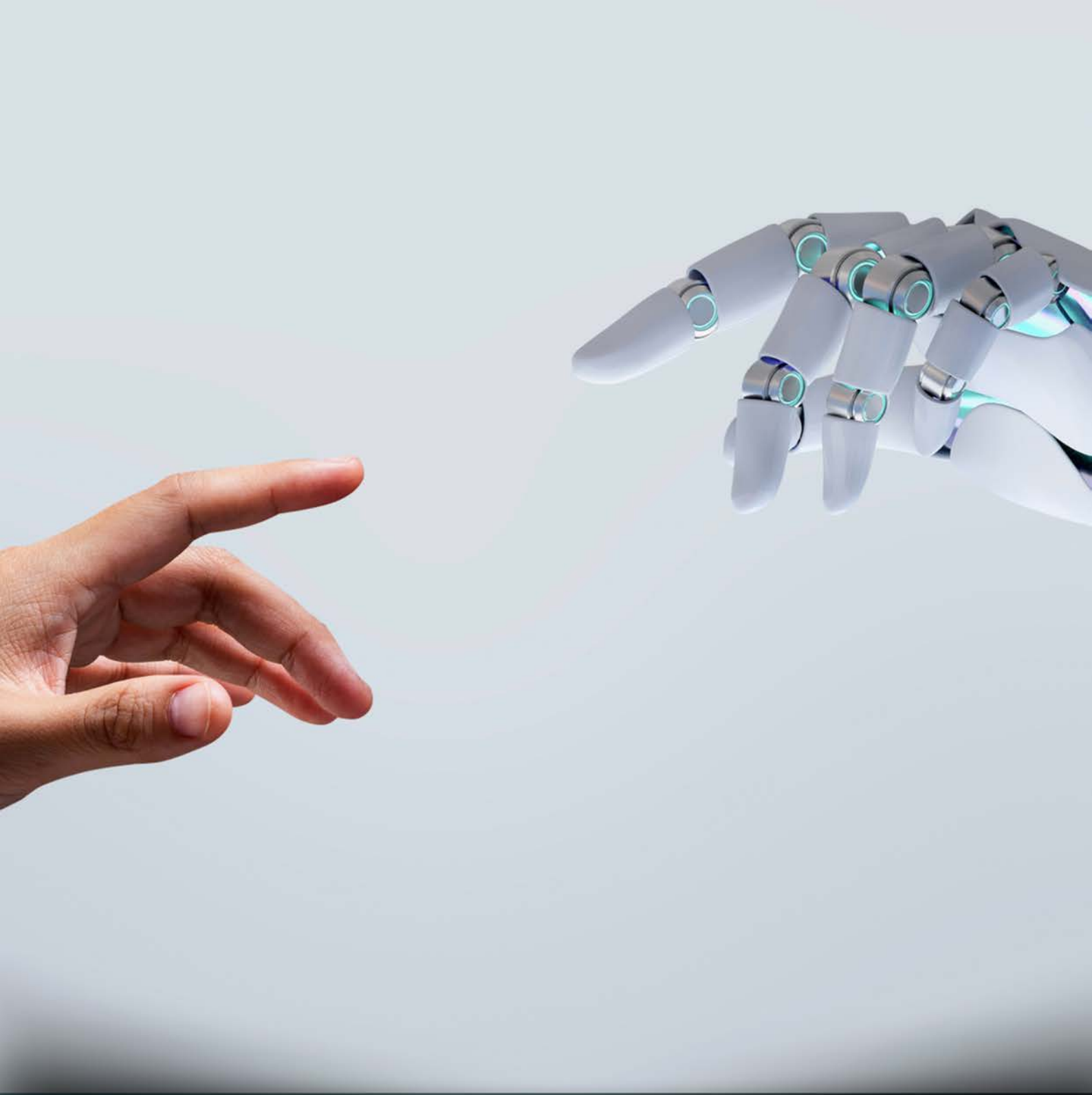
Speaker

JASON LOW

Founder & CEO, Virtualtech Frontier (VTF)

Advancements in immersive technology are revolutionising dental education by creating more interactive, engaging, and learner-centred experiences. This plenary talk explores the role of virtual reality (VR), augmented reality (AR), simulation-based learning, artificial intelligence (AI), and digital workflows in enhancing clinical skills, critical thinking, and student confidence in dental training. In addition, the presentation will address current challenges in implementing immersive technologies, including accessibility, cost, faculty readiness, and the need for evidence-based integration into teaching and assessment practices.

Ceo & Founder of Virtualtech Frontier, Author,
Creator & Host of GO Meta! Podcast
Master in Computer Science, Universiti Teknikal Malaysia Melaka
Bac. of Computer Science, Universiti Teknikal Malaysia Melaka
Diploma in Computer Science, Universiti Teknikal Malaysia Melaka



participants & layout

List of Participants

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No	Abstract ID	Title	Table No.	Category
1	21115	UiTM Centric Relation Bite Wafer	1	Professional
2	21116	Versy-TS	2	Professional
3	21120	TASHKHIS DENTAL AI	3	Professional
4	21121	MYQuitMate	4	Professional
5	21123	NiQuiTeen	5	Professional
6	21127	PediDent Charting System	6	Professional
7	21132	Slot modification in CM-5	7	Young
8	21136	Interactive Periodontic Board & Interactive Oral Hygiene Board	8	Young
9	21139	Beyond the Naked Eyes: 3D Facial Mapping of Post-Surgical Swelling using KIRI Engine	9	Young
10	21140	Multifunctional Enamel Holder	10	Young
11	21142	Kembara Gigi Sihat: An Interactive Video- And Game-Based Oral Health Education Module For Malaysian Schoolchildren	11	Young
12	21143	Dentistry Decoded	12	Young
13	21156	The Nipon 1-1 Flipbook: A Bilingual Oral Health Education Tool for the Kadazandusun Community	13	Professional
14	21157	Restoration Band: A Novel Wearable Solution for Enhanced Precision in Two-Handed Dentistry	14	Professional
15	21158	iMPON: Senyuman Sihat Sepanjang Hayat – An Oral Health Education Kit	15	Professional

List of Participants

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No	Abstract ID	Title	Table No.	Category
16	21145	Berry Buckle	16	Professional
17	21144	3D-Printed Endodontic Emergency Simulators: Integrating Customized Periapical Abscess Designs for Enhanced Endodontic Emergency Management Training.	17	Professional
18	21159	Dental Pictovisual Guide	18	Professional
19	21146	Modulatory Effect of Pleurotus ostreatus Extract Gel on Macrophage Response during Traumatic Ulcer Healing in Wistar Rats	19	Professional
20	21147	Public Awareness of Dry Mouth (Xerostomia) and Its Impact on Quality of Life in Aging Populations: A Cross-sectional Descriptive Observational Study	20	Professional
21	21148	Effect of Centella asiatica Leaf Extract Gel on CRP Expression as an Anti-Inflammatory Response in Incised Rats	21	Professional
22	21149	The Role of Cemcem Leaf Extract (Spondias Pinnata (L.f) Kurz) Gel Preparation on the Number of Fibroblast Cells in the Healing of Traumatic Ulcers in Male Wistar Rats (Rattus Norvegicus)	22	Professional
23	21150	Bamboo Fiber (Gigantochloa apus) Can Increase the Impact Strength of Heat Polymerized Acrylic Resin	23	Professional

List of Participants

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No	Abstract ID	Title	Table No.	Category
24	21152	Soaking of Acrylic Resin Plates in Red Grape Juice and Jamblang Fruit Juice in Reducing Candida Albicans Colonies	24	Professional
25	21153	Moringa Leaves Extract Inhibits the Growth of Staphylococcus Aureus Bacterial Colonies on Heat-Polymerized Acrylic Resin	25	Professional
26	21154	Effect of Vannamei Shrimp (Litopenaeus vannamei) Chitosan on Candida Albicans Colony Counts in Heat-cured Acrylic Resin	26	Professional
27	21155	Addition Coating Nanochitosan Windu Prawn Shrimp Shell (Penaeus Monodon) on Heat Polymerized Acrylic Resin Increase the Transverse Strength	27	Professional
28	21160	CHITOCAL : Redefining Periodontal Bone Regeneration	28	Young
29	21161	MYVAI DENTAL: Voice-Activated Dental Charting	29	Young
30	21162	PerioSmartX by UiTM: Scan. Learn. Care	30	Young
31	21163	Customized Orthodontic Mini-Implant Guide	31	Professional

List of Participants

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No	Abstract ID	Title	Table No.	Category
32	21164	Beyond The Microscope: Transforming Static Microscopy into an Interactive, AI-Guided Learning Ecosystem	32	Professional
33	21165	Entrepreneurship and Management in Dentistry: A Practical Guide	33	Professional
34	21167	OSA EduTube: A Multidisciplinary, Multilingual YouTube-Based Patient Education Innovation for Obstructive Sleep Apnoea	34	Professional
35	21169	Exploring the Features for Ai-Powered App in Delivering Oral Health Messages to Hearing Impaired Patients	35	Young
36	21170	PetraMatrix: Development of a Novel White Petrolatum-Based Antibiotic Paste for Root Canal Disinfection	36	Young
37	21171	AI-Powered Storytelling for Early Childhood Dental Health Education	37	Young
38	21172	Annatto Tocotrienol: A Dual-Action Innovation for Oral and Cardiovascular Health	38	Professional
39	21173	Endo3DT: 3D-Printed Tooth Models for Endodontic Competency Training	39	Young
40	21174	Quit Game: Enhancing Oral Cancer Education Through Digital Gamification	40	Young
41	21181	ByteWise: Assisting clinical decisions, Redefining care through innovation	41	Young

List of Participants

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No	Abstract ID	Title	Table No.	Category
42	21178	Brush & Play: A Puppetry Adventure for Little Teeth	42	Professional
43	21180	A Multifunctional Bioactive Saliva for Pulp Preservation and Orthodontic–Prosthodontic Biofilm Modulation	43	Young
44	21175	iBPouch: Development of a Dual-Channel Buccal Pouch Cleaner for Hyposensory Patients	44	Young
45	21182	Developing Artificial Intelligence Prototype for Classifying Crude Stingless Bee Propolis towards Innovation in Dentistry	45	Young
46	21183	PerioCare: A Patient-Centred Post-Surgical Care Guide for Periodontal Patients	46	Young
47	21184	Digital Dental Implant Passport (MyImplantID)	47	Professional
48	21186	Calm-in-3: Transforming Dental Cubicles into Sensory-Friendly Spaces for Children	48	Young
49	21188	UlcerTrack: A Smart Digital Diary for Recurrent Oral Ulcer	49	Young
50	21189	DoSE: Drug Oral Side Effects Smart Explorer	50	Young

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No	Abstract ID	Title	Table No.	Category
51	21190	OmniRetra	51	Young
52	21191	Illuminate to Navigate: Endodontic Microilluminator	52	Young
53	21192	DentaSense: A Smart Multi-Sensory Denture Hygiene System for Geriatric Care	53	Young
54	21194	Beyond the Chair: A Virtual Reality Journey into the Pathogenesis of Odontogenic Infective Endocarditis	54	Young
55	21195	i-Read (Interactive Reading) : Bridging the Gap between Static PDFs and Interactive and Generative AI	55	Young
56	21197	"Catching a Silent Killer" : Usage of Augmented Reality in Periodontics	56	Young
57	21198	OcaR: A Smart Oral Cancer Risk Assessment Application "Early Detection, Timely Intervention"	57	Young
58	21199	F.A.C.E.-I.D (Facio-Cervical Evaluation – Impairment & Disfigurement): A simple Novel Index for Head and Neck Burns	58	Professional
59	21200	AcademicAlerts: An Innovative Web Portal for Verified Academic Events	59	Professional

Booth Layouts

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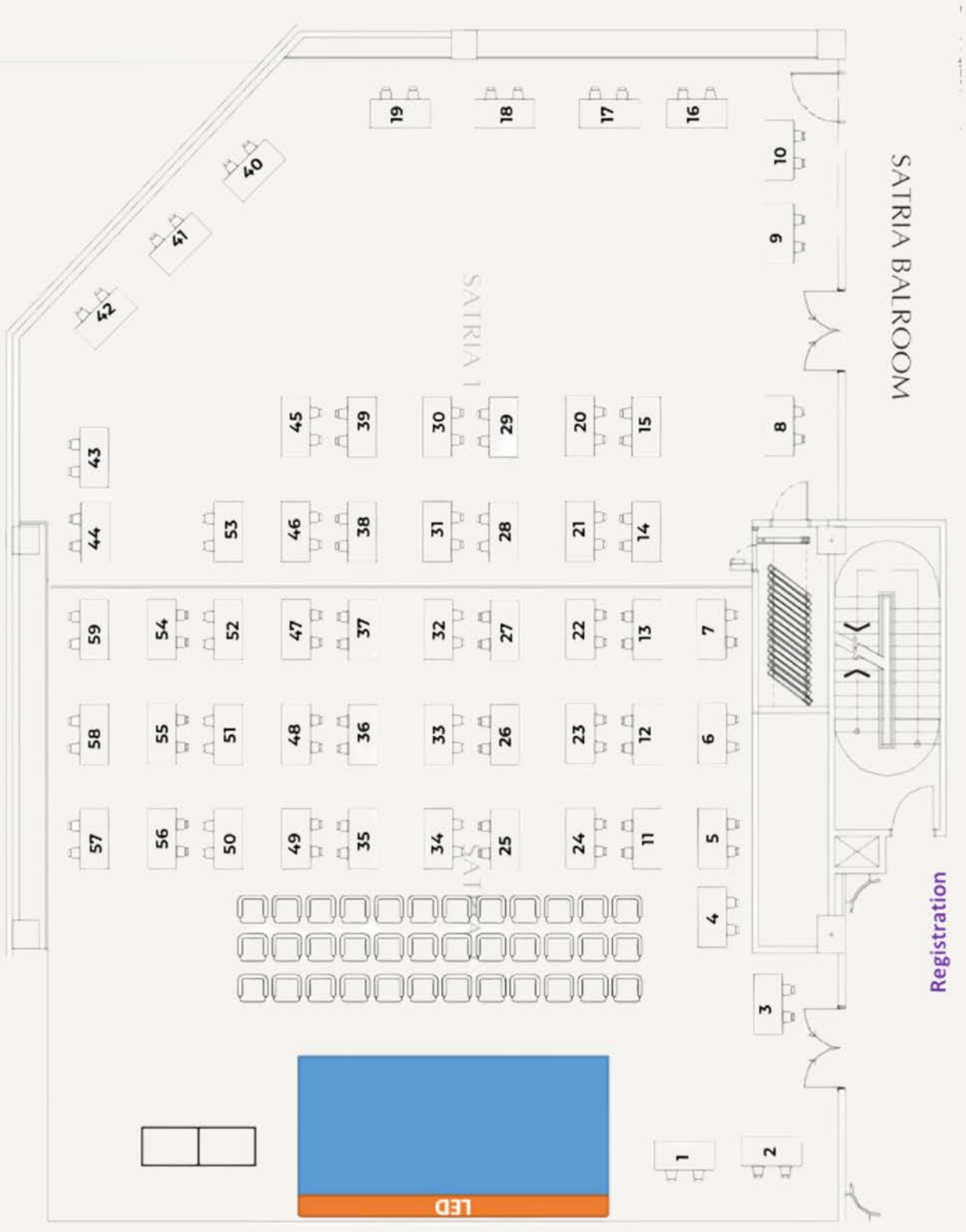

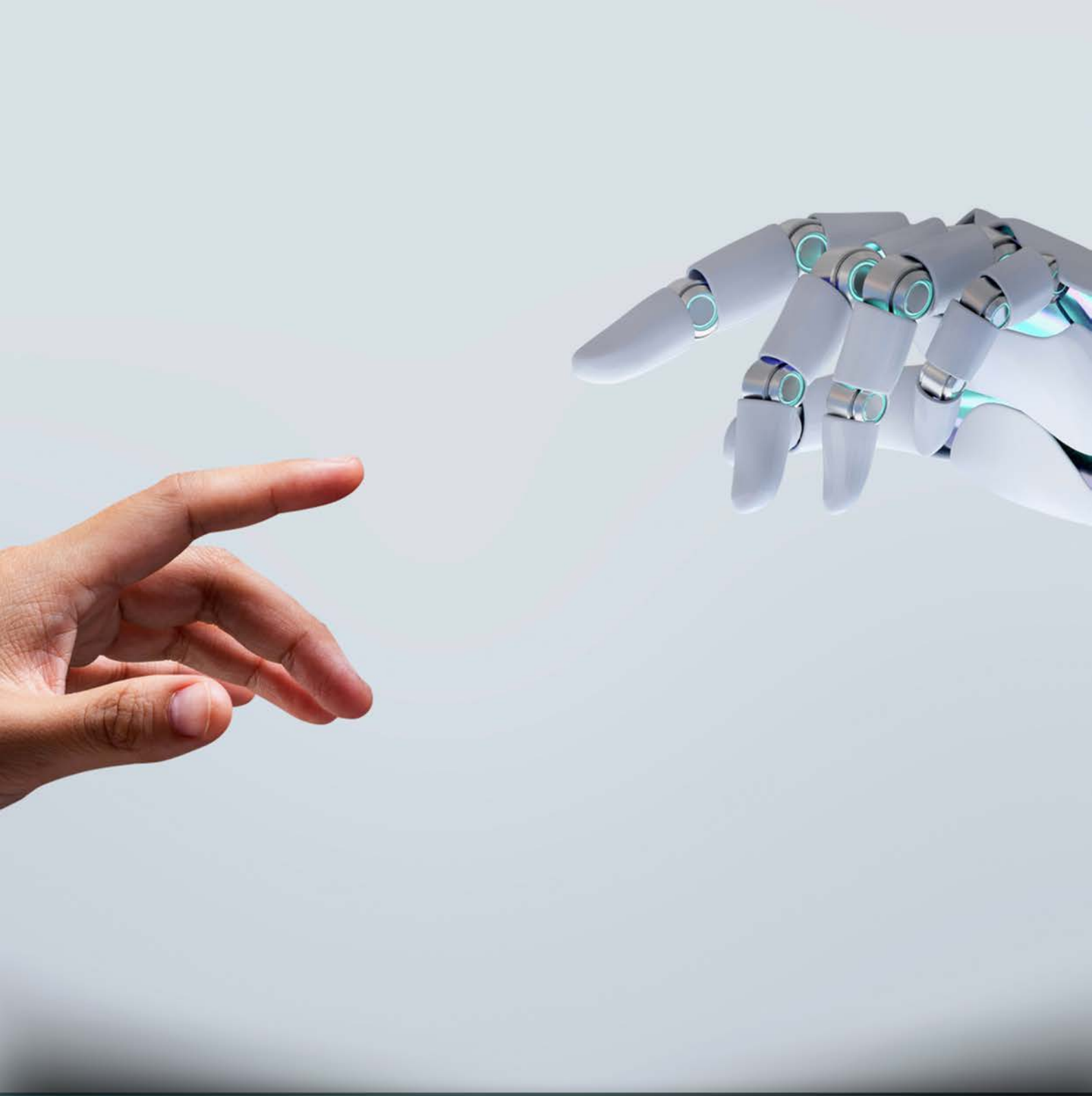

abstract

ID 21115 UiTM Centric Relation Bite Wafer

Jonathan Jun Xian Yuen[1], Zethy Hanum Mohamed Kassim[1], Nadhirah Gazhali[1], Nur Eida Sazali[1], Nur Aida Mohamed Razali[1], Wan Haifa Athirah Nik Mansor[1], Nur Shafikah Nasaruddin[1], Adillah Radhiah Roney[1], Amal Shafiq Dalal[1], Siti Suhaila Binti Zakaria[1], Muhammad Syazwan Junoh[1], Adalia Ain Perali[2], Wan Nur Fatin Wan Sulaiman[2].

[1]Faculty of Dentistry, Universiti Teknologi MARA, Selangor, Malaysia

[2]Kulliyyah of Dentistry, International Islamic University Malaysia, Pahang, Malaysia

Email: xermillion89@gmail.com

Abstract

Background/Problem Statement: Recording an accurate centric relation (CR), which is a jaw position determined by the neuro-musculature, allows for precise analysis of tooth contacts and occlusion. This in turns influences design of the chewing surface of the prosthesis, reducing the risk of occlusal discrepancies, temporomandibular dysfunction, and costly adjustments or remakes. Conventional CR recording methods often rely on multiple components, including interocclusal wafers and custom-made or prefabricated incisal separators fabricated from resin, wax, plastic, or metal. While widely used, these approaches are technique sensitive, time-consuming, and contribute to material waste, environmental burden, and increased procedural costs. The need for a more streamlined, efficient, and sustainable approach is evident in modern prosthodontic practice. **Objective:** The development of a 3D-printed UiTM tray with an integrated, graduated incisal separator aims to simplify CR recording. **Novelty:** The innovation lies in the integration of an incisal separator and a tray in a single digitally designed device that enables a precise vertical dimension control through calibrated thickness increments. It is designed to work seamlessly with various bite registration materials, offering clinicians flexibility, while additive manufacturing ensures reproducibility, customization, and scalability for both clinical and educational applications. **Benefits:** The anticipated benefits include improved procedural efficiency, reduced material waste, and enhanced accuracy of CR recording, aligning with sustainability initiatives in dentistry. Additionally, the standardization of this device holds potential to improve training efficiency in prosthodontic education and promote consistency in clinical outcomes.

Keywords. 3D printing, centric relation, interocclusal record, prosthodontics, sustainability

ID 21116 Versy-Ts Implant Abutment: Retentive, Effective and Versatility

Nur Hafizah Kamar Affendi[1], Ammar Yasser Abdul Hakim @ Abdul Khakin[1], Nur Syafikah Nasaruddin[2], Rohana Ahmad[2], Melati Mahmud[2]

[1]Centre of Studies in Restorative Dentistry, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh, Selangor, Malaysia

[2]Prosthodontic Resident, Doctor of Clinical Dentistry in Prosthodontics, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh, Selangor, Malaysia.

[3]Nitium Technology Sdn. Bhd. Bangi, Selangor, Malaysia

Email: xermillion89@gmail.com

Abstract

Background: With advances in digital computer-aided design and manufacturing (CAD/CAM), the standard workflow for implant restorations typically involves prefabricated titanium bases (Ti-Bases) and digitally designed zirconia or lithium disilicate crowns. Problem Statement: Despite these improvements, conventional Ti-Bases remain prone to complications such as abutment loosening and loss of retention, largely due to their reliance on adhesive bonding alone. **Objective:** The Versy-T abutment system was developed to address these limitations. **Methods/Novelty:** It incorporates three integrated notches (vertical, horizontal, and oblique) that provide additional retentive features, ensuring superior anti-rotational stability and facilitating screw-channel repositioning. Its concave collar with a rounded cuff supports a natural emergence profile, optimizing peri-implant tissue health. The system is available in both engaging and nonengaging designs, offering broad compatibility across implant platforms and reducing outsourcing needs for clinicians and laboratories. Building on this foundation, the VersyTs system introduces further advancement: a precision sandblasted surface treatment that creates a controlled micro-roughness. **Benefits:** This improves micromechanical retention, strengthens the adhesive bond between abutment and luting agents, reduces the risk of de-cementation, and promotes long-term prosthetic stability. The surface is pre-treated during manufacturing, eliminating the need for additional laboratory sandblasting, saving time, and ensuring consistent bonding performance without special preparation.

Keywords: Abutment, Multiunit Implant, Single crown, Suprastructure

ID 21120

Tashkhis Dental AI: Smart Web App for Early Oral Disease Detection

Assoc. Prof. Dr. Mohd Haikal Muhamad Halil[1], Assoc. Prof. Dr. Khairul Bariah[2], Asst. Prof. Dr. Nur Adilah Harun[2]

[1]Department of Restorative Dentistry, Kulliyyah of Dentistry, International Islamic University Malaysia (IIUM), Kuantan, Pahang, Malaysia

[2]Department of Oral and Maxillofacial Surgery & Oral Diagnosis, Kulliyyah of Dentistry, International Islamic University Malaysia (IIUM), Kuantan, Pahang, Malaysia

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Abstract

Background: Oral diseases such as dental caries and periodontal bone loss remain among the most common health problems worldwide, yet they are often detected at late stages, leading to complex and costly treatment. **Problem Statement:** Many communities and smaller clinics lack access to specialized diagnostics, widening disparities in oral health care. To address this challenge, Tashkhis Dental AI was developed at IIUM as a smart, web-based application powered by artificial intelligence (AI). **Objective:** The objective of this project is to provide an accurate, accessible, and affordable diagnostic support tool for both clinicians and communities, empowering early detection and preventive care. **Methods:** Using ethically curated intraoral and panoramic radiographs, deep learning convolutional neural networks (CNNs) were trained and validated, achieving diagnostic accuracy above 97% in detecting caries, bone loss, and oral pathologies. The system is integrated into a secure cloud-based web platform with three main modules: (i) a clinical module to assist dentists in treatment planning, (ii) a community screening module for outreach programmes, and (iii) a research and education module to support student learning and innovation. **Novelty:** The novelty of Tashkhis Dental AI lies in its combination of advanced AI algorithms with a user-friendly web interface, making sophisticated diagnostics scalable and available beyond specialist settings. By streamlining workflows, reducing diagnostic errors, and enabling mass community screenings, the platform provides direct benefits to clinicians, patients, and the wider community. More importantly, it demonstrates IIUM's role in digital healthcare innovation while aligning with Sustainable Development Goal (SDG) 3: Good Health & Well-Being and SDG 9: Industry, Innovation & Infrastructure. **Benefits:** This project reflects IIUM's Tawhidic mission by integrating technology with social responsibility, ensuring that innovation serves humanity ethically and effectively, ultimately contributing to global oral wellness.

Keywords: Artificial Intelligence, Dental Diagnostics, Early Detection, Oral Health, Web Application

ID 21121 MYQuitMate

Nur Nuha Mohd Nazeri[1,2], Nur Syafrina Mohd Sanif[1,2], Muhammad Huzaifah Jusoh[1,2], Muhammad Firdaus Mokhtar[1,2], Hayati Abd Rahman[3], Nawwal Alwani Mohd Radzi[1], Norashikin Yusof[1], Diyana Shereen Anwar[1], Raja Nur Adilah Raja Abdul Rahman[1]*

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[2]Oral Health Programme, Ministry of Health, Block A, Kompleks E, 62590 Putrajaya, Federal Territory of Putrajaya, Malaysia
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Abstract

Background: Smoking remains a public health concern in Malaysia and contributes to preventable oral and systemic diseases, including cardiovascular disease, cancer, chronic respiratory disease, impaired fertility, and oral complications. Although cessation services exist, many smokers still struggle to quit due to relapse, low motivation, and limited support outside routine clinical settings. **Problem Statement:** Current smoking cessation interventions and applications often lack continuity, personalisation, and sustained engagement. Many do not adequately address behavioural and psychological aspects of nicotine addiction, such as cravings, stress, and poor long-term adherence. This underscores the need for an innovative digital tool that complements conventional cessation pathways and provides continuous behavioural support. **Objective:** This project aimed to design and develop an innovative smoking cessation application that leverages artificial intelligence (AI)-driven conversational support, gamification, and behavioural tracking to improve engagement and motivation among smokers in Malaysia. **Methods/Novelty:** MYQuitMate offers a unified platform that combines AI-driven conversational counselling, gamified motivation, behavioural tracking, and oral health-linked follow-up. It extends smoking cessation support beyond clinic hours through personalised quit strategies, real-time chatbot coaching, and app-based self-management tools, while strengthening continuity of care by linking users with their attending dentist. Gamification features such as streaks, progress badges, and challenges enhance user engagement and motivation. **Benefits:** MYQuitMate can potentially improve access to cessation support, strengthen relapse prevention, and promote healthier behaviour among smokers. As a digital intervention, it complements national tobacco control and oral health promotion efforts by offering accessible, user- centred support, with potential to reduce smoking-related disease burden, lower healthcare costs, and improve quality of life.

Key words: artificial intelligence; gamification; Malaysia; mobile health; smoking cessation

ID 21123 NiQuiTeen

Aziyati Azman[1], Khairina Amyra Khirul Ambia[1], Chuah Yan Ru[1], Sofea Nadhirah Bawawi[2], Nur Jawidah Mohamed Raihan[2], Ashavathany Sukumaran[2], Nurul Nadia Husin[2]

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Abstract

Background: The Kesihatan Oral Tanpa Amalan Merokok (KOTAK) program has been implemented nationwide in Malaysia since 2016 to identify and provide early intervention for student smokers. **Problem Statement:** However, the effectiveness of the programme remains limited due to challenges associated with the conventional face-to-face intervention model, including time and manpower constraints, low student engagement, and poor continuity of follow-up sessions. **Objective:** This study aims to improve the completion rate of intervention sessions, increase the number of students who set a quit date, and enhance long-term smoking cessation outcomes through the development of NiQuiTeen, an in-house web-based application. **Methods/Results:** The innovation introduces a digital transformation of the KOTAK programme by incorporating gamification elements such as daily check-in streaks and badge collection to enhance motivation and engagement among adolescents. By providing continuous virtual monitoring, flexible intervention delivery, and interactive educational content, NiQuiTeen overcomes geographical and logistical barriers while aligning with the digital preferences of Generation Z users. The implementation of NiQuiTeen demonstrated significant improvements, with student motivation to quit smoking increasing from 25% to 100% and knowledge of cessation methods rising from 50% to 100%. **Novelty:** The application also improved continuity of care and increased participation in intervention sessions. **Benefits:** Overall, NiQuiTeen offers a scalable, cost-effective, and user-friendly solution that strengthens smoking cessation interventions among adolescents and contributes to the nation's goal of achieving a smoke-free generation.

Key words: Adolescent, Digital intervention, KOTAK, NiQuiTeen, Smoking cessation

ID 21127 PediDent Charting System

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Abstract

Background: Dental charting is an essential component of dental examination, diagnosis, and treatment planning. Traditionally, this process is performed either manually with pen and paper or via direct computer input, which can be time-consuming, less efficient, and poses challenges in maintaining cross-infection control in clinical settings if it is done single handedly. **Problem Statement:** Conventional methods of dental charting require hand-operated input manually or by using computer (4-handed dentistry required). When performed independently, they may disrupt procedure workflow, increase the risk of cross-contamination between patients, prolong procedure time, and thus reduce practicality in daily dental practice. **Objective:** The aim of this project is to develop an alternative dental charting system that simplifies the recording process, enhances infection control, and offers a cost-effective and user-friendly solution. The system is designed to be independently operatable by a single dental practitioner, making it practical for all clinicians. **Methods/Novelty:** The PediDent Charting System (PDCS) introduces a wireless foot-control device integrated with a specialized computerapplication for dental charting. This innovation provides a plug-and-play solution, comprising the custom developed foot pedal and software, eliminating the need for hand-operated input during procedures. The prototype has been validated by a Certified Engineer and IT Specialist, and registered under MyIPO, ensuring technical reliability and intellectual property protection. **Benefits:** PDCS improves clinical efficiency, reduces cross-infection risks, and supports modern dental practice by offering a convenient, adaptable, and scalable solution. With strong commercialization potential, PDCS presents a significant advancement in dental procedure innovation, not only within Malaysia but also in the global market.

Key words: dental charting, dental charting system, wireless foot-control device.

ID 21132

Alternative Transmission Mask for Spectrophotometric Translucency Analysis

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Abstract

Background: Light translucency is a key physical property of orthodontic thermoplastic retainers that directly influence their aesthetic acceptability. Accurate assessment of this property is commonly performed using the Konica Minolta CM-5 Spectrophotometer, which relies on a standardized transmission mask (TM) with a Ø26mm aperture to control light transmission through the tested material. **Problem Statement:** However, the availability of only a single transmission mask per device presents a practical limitation, as loss or damage of the TM can interrupt ongoing research and may incur substantial costs for the replacement of the TM. **Objective:** This study aimed to develop and validate two cost effective alternatives to the original TM without compromising the measurement accuracy. **Methods/Results:** A modified black cardboard was initially designed to replicate the dimensions and function of the standard Ø26mm TM. Comparative analysis demonstrated no significant difference in light translucency measurements between the modified cardboard of Ø25mm/Ø26mm/Ø30mm and the original TM, confirming its functional reliability. Building upon this finding, a more durable prototype was subsequently fabricated using stainless steel material, offering improved structural stability, precise adaptation to the spectrophotometer interface, and engraved guides to enhance positioning accuracy during measurements. The stainless-steel prototype also produced comparable translucency results to the original TM, further supporting its validity. **Novelty:** These innovations provide a practical, economical, and reproducible solution for researchers and clinicians testing the spectrophotometric analysis of thermoplastic materials. **Benefits:** Both black cardboard and the stainless-steel prototype, which are accurate substitutes to the original TM, may enhance accessibility, minimize operational disruptions, and support unhindered research using the Konica Minolta CM-5 Spectrophotometer.

Key words: Stainless steel transmission mask substitute; light translucency; spectrophotometry; thermoplastic retainer; black cardboard transmission mask

ID 21136 Interactive Perio Board & Oral Hygiene Board

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Abstract

Background: The Interactive Perio Board and Oral Hygiene Board are innovative educational tools designed to enhance patients' understanding of periodontal disease and oral hygiene practices through engaging and interactive communication. **Problem Statement:** Conventional oral health education in dental settings often relies on a one- way approach, where information is delivered passively by dental professionals, limiting patient engagement and motivation for behavioural change. **Objective:** To address this limitation, the innovation adopts a hands-on, visual, and participatory learning model that actively involves patients in the educational process. **Methods:** The boards are portable and magnetic, incorporating removable components that illustrate different stages of periodontal disease alongside various oral hygiene tools, such as toothbrushes, dental floss, interdental brushes, mouthwash, and tongue scrapers. Each component is crafted from shrink plastic—designed, heated to shrink and harden, and fitted with a magnet— resulting in durable, lightweight, and visually appealing pieces. During the activity, patients are encouraged to identify and correctly position the magnetic items on the board prior to receiving oral hygiene instruction. Their performance is scored, followed by guided education from the dentist. A post-education attempt is then conducted to evaluate improvement, with score differences reflecting enhanced understanding and knowledge retention. **Novelty:** This innovation aims to promote interactive learning and improve oral health education by creating an enjoyable, memorable, and hands-on experience. The materials are cost-effective, easy to reproduce, and suitable for a wide range of age groups, including children, adolescents, adults, and older adults. Its colourful design, simple language, and two-way communication approach improve efficiency, replicability, and overall learning effectiveness, making it adaptable for clinical, academic, and community settings. Preliminary feedback suggests increased patient engagement, improved understanding of periodontal health, and greater confidence in maintaining oral hygiene practices. **Benefits:** Overall, this innovation fosters patient-centred communication, supports experiential learning, and demonstrates strong potential for broader application in dental education and public health initiatives.

Key words: interactive, periodontal disease, oral hygiene

ID 21139 Beyond the Naked Eyes: 3D Facial Mapping of Post-Surgical Swelling using KIRI Engine

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Abstract

Background/Problem Statement: The surgical extraction of impacted mandibular third molars is a ubiquitous procedure in oral and maxillofacial surgery, yet it is consistently associated with post-operative inflammatory sequelae, most notably facial edema. Traditionally, clinicians have relied upon subjective visual assessments or rudimentary 2D linear tape measurements to evaluate swelling; however, these conventional methods are inherently prone to parallax error, lack precision, and fail to capture the complex, non- uniform volumetric changes. **Objective:** This innovation introduces a digital workflow that utilizes smartphone-based LiDAR technology and the KIRI Engine application to generate high-precision 3D facial maps. By leveraging the advanced depth-sensing capabilities of contemporary mobile hardware, we aim to quantify temporal changes in facial swelling volume following third molar extraction and validate the reliability of this smartphone- based photogrammetry against established clinical standards. **Novelty:** The novelty of this approach lies in the accessibility of 3D diagnostic tools; whereas advanced 3D surface scanners are often cost-prohibitive and confined to specialized research centers, our methodology utilizes accessible, portable technology to perform volumetric analysis. By superimposing pre- and post-operative scans, the protocol generates color-coded displacement maps that visualize the exact anatomical localization of edema with unprecedented clarity. **Benefits:** This research offers significant benefits to society by providing a non-contact, hygienic, and highly accessible diagnostic tool that enables objective monitoring of post-surgical recovery. Ultimately, this 3D mapping technique empowers clinicians to move away from subjective estimations toward a more rigorous, evidence-based paradigm, facilitating personalized anti-inflammatory interventions and improving patient outcomes in diverse settings, ranging from high-volume university hospitals to remote, resource-limited clinics where professional specialized equipment may be unavailable. By integrating advanced 3D data into routine dental practice, this study bridges the gap between sophisticated engineering and clinical practicality, ensuring that patient care is informed by precise, quantifiable data rather than observational intuition.

Key words: Edema, KIRI Engine, LiDAR, Smartphone

ID 21140 Multifunctional Enamel Holder: Enhancing Standardization of Specimen Preparation

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Abstract

Background: Extracted teeth are widely used as dental experimental substrates for studying microbial interactions and the demineralization-remineralization cycle. The effectiveness of the intervention is often evaluated through surface changes. Therefore, standardization of enamel specimen preparation is critical, as it directly affects the reliability of surface hardness and roughness measurements. **Problem Statement:** However, achieving flat and uniformly polished enamel surfaces remains challenging and regularly introduces variability due to manual handling and sequential processing. Conventional methods involve individual polishing or resin embedding, are time-consuming, reduce usable enamel surface area, and may introduce inconsistencies. Manual handling also increases occupational risk and limits reproducibility across experimental samples. **Objective:** This innovation presents a 3D-printed multifunctional enamel holder designed to standardize specimen preparation by enabling simultaneous polishing of multiple enamel specimens with uniform abrasion. By accommodating moreenamel specimens within a single platform, this innovation also aims to reduce preparation time while improving consistency in surface finishing. This enhances the workflow efficiency compared to conventional single-specimen approaches. **Methods/Novelty:** The proposed device is a customizable, detachable design with an ejectable mechanism, allowing safe and efficient enamel specimen removal without surface damage. Its versatility supports use as a polishing holder, a base for surface testing, and dimensional template for the enamel specimens. Fabricated via fused deposition modeling (FDM) using acrylonitrile styrene acrylate (ASA), this device offers superior heat and abrasion resistance. Additionally, the integrated measurement slots facilitate standardized specimen dimensions and uniform geometry across all samples. **Benefits:** Overall, this innovation improves efficiency, reproducibility, and safety in enamel specimen preparation while reducing procedural time and variability, making it a practical solution for dental research applications.

Key words: 3D printed device, dental materials research, enamel specimen preparation, enamel holder, standardization

ID 21142

KEMBARA GIGI SIHAT: AN INTERACTIVE VIDEO- AND GAME-BASED ORAL HEALTH EDUCATION MODULE FOR MALAYSIAN SCHOOLCHILDREN

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Abstract

Background: Oral diseases among children remain a significant public health concern despite being largely preventable. Effective oral health education plays an important role in promoting preventive behaviours, and interactive approaches such as video- and game-based learning enhance engagement, improve understanding, and support positive oral health behaviours among children. **Problem statement:** In Malaysia, oral health education is delivered annually through the school dental service; however, oral diseases such as dental caries and periodontal disease remain highly prevalent among schoolchildren. Conventional oral health talks provided to schoolchildren are often perceived as uninteresting and repetitive. Despite evidence supporting the use of interactive educational approaches, locally developed oral health education modules tailored for Malaysian schoolchildren remain limited. **Objective:** To develop Kembara Gigi Sihat, an interactive video- and game-based oral health education module for Malaysian schoolchildren aged 11 to 12 years. **Novelty:** Kembara Gigi Sihat introduces a culturally tailored module integrating animated storytelling with game-based learning to create an engaging, user-centred experience. Developed through a systematic design process by healthcare professionals experienced in oral health education, it ensures content relevance, clarity, and suitability for schoolchildren. The module combines structured content with interactive reinforcement to promote participation, enhance comprehension, improve retention of key oral health messages, and support positive behaviour change. By shifting from passive information delivery to active engagement, it addresses a key limitation of conventional oral health education approaches. Built using freely available digital platforms, it is adaptable, accessible, and deployable across diverse school settings. Applied as a research-based intervention, it has demonstrated significant improvements in oral health knowledge, attitudes, hygiene practices, dietary behaviours, and oral hygiene among schoolchildren, supporting its effectiveness as a practical educational tool. **Benefits to users and society:** For schoolchildren, the module provides a fun and interactive learning experience that fosters lifelong oral hygiene and healthy dietary habits during a critical stage of behaviour formation. For educators and oral healthcare providers, it offers a practical and efficient tool to enhance existing oral health programmes. At the societal level, this scalable and cost-effective innovation can help improve oral health, reduce disease burden, and strengthen long-term public health outcomes in Malaysia.

Key words: game-based learning, interactive learning, oral health education, schoolchildren, video-based learning

ID 21143

Dentistry Decoded: An Interactive Board Game for Oral Health Education

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Abstract

Background: Oral health is often clouded by myths and misconceptions, leading to inadequate understanding, particularly among adolescents and young adults. Findings from the National Health and Morbidity Survey (Ministry of Health Malaysia, 2019) indicate that beliefs and misinformation significantly affect oral health behaviors and the perceived need to seek dental care. **Problem Statement:** This gap in awareness contributes to the persistence of poor oral hygiene habits and adverse long-term health outcomes. **Objective:** To tackle limited awareness and enduring dental myths, we designed and developed an interactive board game aimed at promoting oral health education among adolescents and young adults in a fun and engaging way. Dentistry Decoded is a Monopoly-inspired board game designed to deliver evidence-based oral health information in a fun, engaging, and accessible format. **Methods/Novelty:** Dentistry Decoded combines vibrant visuals and engaging flash cards to make learning easy and enjoyable while emphasizing on the importance of debunking dental myths. A unique feature of the game is its reward system, where players collect puzzle pieces by landing on specific spaces that ultimately form an image of healthy teeth and a bright smile, symbolizing the outcome of good oral hygiene practices. This approach reinforces key preventive habits such as regular brushing, flossing, and healthy dietary habits. This symbolic reward reinforces the goal of positive oral hygiene. **Benefits:** Dentistry Decoded serves as a step forward in promoting oral health awareness and empowering players to make informed decisions about their dental care, ensuring that oral health becomes a lifelong priority.

Key words: board game, education, oral health, interactive learning, myths, preventive habits.

ID 21144 3D-Printed Endodontic Emergency Simulators: Integrating Customized Periapical Abscess Designs for Enhanced Endodontic Emergency Management Training.

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Abstract

Background: Endodontic emergencies, particularly those involving acute periapical lesions, require immediate and precise clinical intervention by dental practitioners. **Problem Statement:** However, traditional undergraduate training usually focuses on theoretical knowledge over hands-on simulation, leaving students with limited exposure to manage endodontic emergency cases, specifically periapical lesions. Subsequently, the gap in training can lead to a lack of clinical confidence among dental students, who must master high-level tactile precision to perform procedures like incision and drainage in high-pressure, real-world settings. **Objective:** Hence, this project aimed to bridge the transition from theory to practice by developing a high-fidelity, 3D-printed teaching aid model featuring a customized internal abscess to simulate emergency incision and drainage and subsequent management needed. **Methods:** Using CBCT data from clinical cases, a 3D-printed mandibular molar model was designed with a hollow periapical chamber located at the apex of the lower tooth, which will be fabricated by a technician from the dental laboratory. This chamber was designed to house a simulated exudate. The models were fabricated using 3D printing with radiopaque resin and covered with a silicone gingival mask. **Novelty:** Unlike standard models, the "Customized Abscess Design" allows for the simulation of fluctuant swelling by using designated slime with a balloon cover. **Benefits:** The integration of 3D printing allows students to build procedural confidence in a risk-free, anatomically accurate platform for students to practice emergency endodontic procedures, potentially reducing clinical errors in real-world practice. By providing a platform that mimics the physical resistance and fluid dynamics of a real abscess, this teaching aid significantly enhances procedural confidence. Ultimately, this innovative simulation tool serves to refine clinical skills and improve patient safety by reducing the margin of error during the transition to live clinical practice.

Key words: 3D printing, CBCT, dental education, endodontic emergencies, periapical abscess.

ID 21145 Berry Buckle: A Protective Stabilisation for Special Needs Children

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Abstract

Background: Protective stabilization is an advanced non-pharmacological behavior guiding technique that is implemented when patients are unable or unwilling to cooperate, especially those with special healthcare needs. It helps to reduce anxiety, promote positive dental experience, and ensure the safe delivery of quality oral healthcare. Despite the need for specialized treatments, these patients are entitled to equitable care, consistent with the Ministry of Health commitment to ensure healthcare delivery remains accessible, affordable, and available to all patients without compromising the quality and driving the awareness for timely intervention. **Problem statement:** Dental issues tend to be more prevalent among children with special needs due to their intellectual, physical, social, or emotional impairment. However, providing dental care to uncooperative patients remains challenging because of their sudden and uncontrollable movements, which may cause harm to both patients and clinicians and jeopardize the effectiveness and results of treatment. **Objective:** In order to overcome these difficulties, this idea presents "Berry Buckle," a protective stabilization device. The primary goal of this product is to improve dental screening coverage and dental treatments especially in community-based rehabilitation facilities, which will enhance the oral health status of this vulnerable population. The Berry Buckle is designed to be a practical, lightweight, and kid-friendly full-body stabilization tool that may be used in a variety of clinical and outreach settings. **Novelty:** Its novelty lies in its low-cost design, accessibility, and sustainability, making it suitable for widespread use without requiring complex equipment. This tool introduces a novel approach to dental care for special needs children, allowing for more controlled, less distressing treatment sessions and improving patient comfort. **Benefits:** The implementation of this product has demonstrated several benefits, including reduced check-up time, improved efficiency of clinical procedures, enhanced safety for both patient and operator, and better ergonomic support during treatment. Ultimately, Berry Buckle contributes to improving the quality of dental care and promoting better oral health outcomes among children with special needs.

Keywords: dental care, oral health, protective stabilization, special needs patients, treatment on efficiency

ID 21146 Modulatory Effect of Pleurotus ostreatus Extract Gel on Macrophage Response During Traumatic Ulcer Healing in Wistar Rats

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Abstract

Background: Traumatic ulcers are lesions of the oral mucosa caused by physical,chemical, thermal trauma, or as a side effect of radiation and chemotherapy. These ulcers trigger inflammation and activate immune responses, particularly macrophages, which play a key role in phagocytosis, cytokine secretion, and tissue regeneration. **Problem Statement**: Standard treatment involves eliminating the traumatic factor and administering topical corticosteroids. Herbal medicines offer a promising alternative with fewer side effects. White oyster mushroom (Pleurotus ostreatus) contains antioxidant and anti-inflammatory properties that support wound healing. **Objective:** This study aims to evaluate the effect of Pleurotus ostreatus extract gel on macrophage response during traumatic ulcer healing in Wistar rats. **Methods/Results:** This is an In vivo experimental laboratory study used a post-test only control design with 40 male Wistar rats. Traumatic ulcers were induced and treated with 50% and 100% white oyster mushroom extract gel, triamcinolone acetonide gel, or 2% CMC-Na gel (control). Macrophage counts were assessed on days 3 and 7 post-ulcer induction using an Olympus microscope with Optilab®, observed at 400× magnification across five fields of view, and analyzed using Image Raster software. On day 3, macrophage counts were highest in the 50% extract group (7.5), followed by the 100% extract (5.5), triamcinolone acetonide (4.0), and CMC-Na (1.5). On day 7, macrophage counts were 1.5 (50% extract), 4.0 (100% extract), 3.7 (triamcinolone acetonide), and 5.7 (CMC-Na). **Novelty/Benefits:** Pleurotus ostreatus extract gel at a 50% concentration was the most effective in increasing macrophage counts during the early healing phase of traumatic ulcers in male Wistar rats.

Key words: Pleurotus ostreatus, Traumatic Ulcer, Macrophage

ID 21147 Public Awareness of Dry Mouth (Xerostomia) and Its Impact on Quality of Life in Aging Populations: A Cross-sectional Descriptive Observational Study

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Abstract

Background/Problem Statement: Xerostomia (dry mouth) is a common condition among older adults, frequently associated with systemic diseases, polypharmacy, and age-related salivary gland changes. Although it can significantly affect daily function and well-being, public awareness of xerostomia remains limited. **Objective:** This study aimed to evaluate public awareness of xerostomia and examine its impact on quality of life among aging populations. **Methods/Results:** A cross-sectional descriptive observational study was conducted involving patients aged 60 years and older. Oral dryness was evaluated using the Challacombe scale and quality of life was assessed with the OHIP-14 questionnaire. Data analysis using univariate analysis each variable studied. Results and Discussion. A total of 30 participants was included. The mean age was 67.33 ± 6.67 years, ranging from 60 to 86 years. The mean salivary flow rate was 0.080 ±0.014 ml/min. The mean Challacombe score was 7.40 ±1.54, with the majority of participants (73.3%) scoring 8. The mean OHIP-14 score was 42.50 ±7.29, indicating a considerable negative impact of oral conditions on quality of life. The majority demonstrated limited awareness of xerostomia, particularly regarding its causes and potential complications. Participants who reported symptoms of dry mouth showed significantly lower quality of life scores, especially in domains related to functional limitation, physical discomfort, and psychological well-being. Higher awareness levels were associated with better self-care practices and relatively better quality of life outcomes. Conclusion: Xerostomia negatively affects quality of life, emphasizing the need for educational and preventive strategies to improve early recognition and management in aging populations.

Keywords: Virtual Microscopy, AI-Augmented Pedagogy, Diagnostic Reasoning, Scalable EdTech, Interactive Pathology

ID 21148

Effect of Centella asiatica Leaf Extract Gel on CRP Expression as Anti-Inflammatory Response in Incised Rats

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Abstract

Background: A wound is defined as a disruption in tissue continuity, usually caused by skin damage that results in impaired structure and function. The wound-healing process is a complex sequence of overlapping phases, including inflammation, proliferation, and remodeling. This process involves various inflammatory mediators, one of which is C- reactive protein (CRP). CRP is widely recognized as an acute-phase protein and a biomarker of inflammation, particularly during the early stage of wound healing. It reflects the level of inflammatory activity and contributes to host defense, tissue repair, and regeneration. **Problem Statement:** The use of natural substances as alternative therapeutic agents for wound management has increased significantly. One potential plant is gotu kola (Centella asiatica), which is known for its medicinal properties. This plant contains bioactive compounds, especially triterpenoid saponins such as asiaticoside and madecassoside. These compounds exhibit anti-inflammatory and antioxidant activities and can also stimulate collagen synthesis and promote tissue regeneration. Therefore, Centella asiatica has strong potential as an alternative therapy to accelerate wound healing. **Objective:** This study aimed to evaluate the effect of Centella asiatica leaf extract gel at concentrations of 30%, 40%, and 50% on reducing CRP expression during incisional wound healing in Wistar rats. Methods/Results: This study was an in vivo laboratory experiment using a posttest-only control group design. The samples were divided into four groups: three treatment groups receiving Centella asiatica extract gel (30%, 40%, and 50%) and one control group treated with 2% CMC-Na. Data analysis was performed using One-Way ANOVA, followed by the Least Significant Difference (LSD) test to determine significant differences between groups. **Novelty/Benefits:** The results showed that Centella asiatica extract gel significantly reduced CRP expression, indicating its anti-inflammatory effect through inhibition of pro- inflammatory cytokines. Additionally, the treatment enhanced tissue regeneration and accelerated wound healing. The 30–40% concentrations were more effective in reducing CRP expression compared to the 50% concentration and the control group.

Key words: C-Reactive Protein, Centella asiatica leaf, gel, wound healing, rats

ID 21149 EFFECT OF CEMCEM LEAF EXTRACT ON THE NUMBER OF FIBROBLAST IN TRAUMATIC ULCER WISTAR RATS

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Abstract

Background: A traumatic ulcer is a lesion of the oral mucosa caused by various forms of trauma, such as accidental biting, irritation from dentures, or chemical injury. **Problem Statement:** The healing process often requires anti-inflammatory drugs, such as corticosteroids; however, their long-term use may lead to adverse side effects. Therefore, natural ingredients, such as cemcem leaves (Spondias pinnata (L.f.) Kurz), which contain flavonoids, tannins, saponins, and phenolic compounds, are considered potential alternative therapies due to their anti-inflammatory, antibacterial, and antioxidant properties. **Objective:** This study aimed to evaluate the effect of cemcem leaf extract gel at concentrations of 40% and 60% on fibroblast cell counts during the healing process of traumatic ulcers in male Wistar rats (Rattus norvegicus). **Methods/Results:** This in vivo experimental study employed a Post-Test Only Control Group Design using 32 male Wistar rats (Rattus norvegicus), which were divided into eight groups: a negative control group (2% CMC-Na), a positive control group (0.1% triamcinolone acetonide), and treatment groups receiving cemcem leaf extract gel at concentrations of 40% and 60%, applied for 3 and 7 days. Data were analyzed using the Shapiro–Wilk test, Levene's test, One-Way ANOVA, and Tukey's post hoc test. Phytochemical screening showed that the cemcem leaf extract contained flavonoids, saponins, tannins, and phenolic compounds. Descriptive analysis revealed that the highest mean fibroblast count was observed in the 60% extract group after 7 days (3.25± 1.258). However, the One-Way ANOVA test indicated no statistically significant differences among the groups ($p = 0.113$). Despite the lack of statistical significance, there was a trend toward increased fibroblast counts in the 60% concentration group. **Novelty/Benefits:** Cemcem leaf extract gel (Spondias pinnata (L.f.) Kurz) has the potential to enhance fibroblast proliferation in the healing of traumatic ulcers in male Wistar rats (Rattus norvegicus), particularly at a concentration of 60% applied for 7 days, although the observed differences were not statistically significant.

Key words: cemcem leaf, fibroblast, Spondias pinnata, traumatic ulcer, topical gel.

ID 21150 Bamboo Fiber (Gigantochloa apus) can Increase the Impact Strength of Heat Polymerized Acrylic Resin

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Abstract

Background/Problem Statement: Heat-polymerized acrylic resin (HPAR) has the disadvantage of low impact strength, which can lead to fractures. Bamboo fiber has a cellulose content of about 74%, higher than that of other fibers. **Objective:** This study aims to investigate the differences in impact strength of HPAR after the addition of bamboo fiber nanocellulose at concentrations of 0.5%, 1%, and 1.5%. This study employed a laboratory experimental method with a post-test control group design. **Methods/Results:** A total of 24 samples of HPAR plates were divided into four groups: a control group without bamboo fiber nanocellulose, and three treatment groups with concentrations of bamboo fiber nanocellulose at 0.5%, 1%, and 1.5%. Impact strength was measured using a Charpy impact testing machine. One-Way ANOVA analysis showed a significance value of 0.022 ($p < 0.05$). This indicates that there is a significant difference in the results from the addition of bamboo fiber nanocellulose to the HPAR. Post Hoc tests showed that the control group significantly differs from groups P1, P2, and P3 ($p > 0.05$). **Novelty/Benefits:** The conclusion is that the addition of bamboo fiber nanocellulose (Gigantochloa apus) at concentrations of 0.5%, 1%, and 1.5% increases the impact strength, and the highest increase in impact strength on HPAR occurs with the addition of a concentration of 1.5%.

Key words: bamboo fiber nanocellulose, heat-polymerized acrylic resin, impact strength

ID 21152 Soaking Acrylic Resin Plates in Red Grape and Jamblang Fruit Juice to Reduce Candida Albicans

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Abstract

Background: Heat-polymerized acrylic resin denture bases are widely used due to their esthetic appearance, cost-effectiveness, and ease of processing. **Problem Statement:** However, this material is susceptible to the adhesion and growth of Candida albicans, which increases the risk of denture stomatitis. The use of natural substances as alternative denture disinfectant solutions, such as red grape juice (Vitis vinifera L.) and jamblang fruit juice (Syzygium cumini), has potential antifungal effects due to their flavonoid, tannin, anthocyanin, and saponin contents. **Objective:** This study aimed to evaluate the effectiveness of immersing heat-polymerized acrylic resin plates in red grape juice and jamblang fruit juice at concentrations of 30%, 60%, and 90% against the growth of Candida albicans. **Methods:** This study was an experimental laboratory study using a post-test only control group design. Heat-polymerized acrylic resin plate samples contaminated with Candida albicans were divided into five groups: a negative control group (distilled water), a positive control group (Fittydent®), and treatment groups immersed in red grape juice and jamblang fruit juice at concentrations of 30%, 60%, and 90%. After 24 hours of immersion, the number of Candida albicans colonies was counted. Statistical analysis using the Kruskal–Wallis and Mann–Whitney test showed significant differences among the treatment groups ($p < 0.05$). Results: The results showed that red grape juice (Vitis vinifera L.) and jamblang fruit juice (Syzygium cumini) have potential as effective natural antifungal agents in reducing the number of Candida albicans colonies on heat-polymerized acrylic resin plates. **Novelty/Benefits:** It was concluded that red grape juice and jamblang fruit juice were effective in reducing Candida albicans colonies on heat-polymerized acrylic resin denture bases, with the 90% concentration showing the highest effectiveness.

Key words: Candida albicans, heat-cured acrylic resin, java plum, red grape.

ID 21153

MORINGA LEAVES EXTRACT (Moringa oleifera) INHIBITS THE GROWTH OF Staphylococcus aureus BACTERIAL COLONIES ON HEAT-POLYMERIZED ACRYLIC RESIN

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Abstract

Background: Staphylococcus aureus bacteria have the ability to adapt to various environments, including the oral cavity especially in patients who use dentures. **Problem Statement:** S. aureus can colonize the surface of dentures, leading to various infections such as angular cheilitis and denture stomatitis. One potential solution is the use of natural agents as denture cleansers, such as Moringa leaves (Moringa oleifera), which contain active compounds like flavonoids and tannins with antibacterial properties. **Objective:** This study aims to determine the effectiveness of Moringa leaves extract (Moringa oleifera) at concentrations of 50% and 75% in inhibiting the growth of S. aureus bacterial colonies on heat-polymerized acrylic resins. **Methods/Results:** This study was a laboratory experimental study using a post-test only control group design. The Moringa leaves extract was prepared using the maceration method with 96% ethanol, with a soaking duration of 15 minutes. The number of S. aureus colonies was measured using the Total Plate Count (TPC) method. Descriptive analysis showed that the lowest mean colony count inhibition (CFU/mL) was found in the 75% Moringa leaf extract group at 3.2 × 103 ± 394.28, followed by the 50% concentration at 4.4 × 104 ± 2743.7. Furthermore, the Kruskal– Wallis test and post-hoc Tamhane test indicated a significant difference between the 75% and 85% concentrations of Moringa leaf extract ($p < 0.05$) in inhibiting the growth of S. aureus colonies. **Novelty/Benefits:** Based on the results and statistical analysis, it can be concluded that Moringa leaves extract (Moringa oleifera) has potential as an antibacterial agent for maintaining denture hygiene and reducing the risk of infections caused by S. aureus.

Key words: antibacterial, heat-polymerized resins, Moringa leaves, Staphylococcus aureus.

ID 21154 Effect of Vannamei Shrimp Chitosan on Candida albicans Colony Counts in Heat-Cured Acrylic Resin

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Abstract

Background: The accumulation of plaque and food debris in denture users may promote the growth of Candida albicans in the oral cavity and contribute to the development of denture stomatitis, one of the most common oral mucosal disorders among denture wearers. More than half of denture users experience this condition, which may cause discomfort, inflammation, and reduced oral health quality. **Problem Statement:** The surface characteristics of acrylic resin denture bases, such as microporosity and surface roughness, facilitate microbial adhesion and support the colonization of Candida albicans. In addition, the area of oral mucosa covered by dentures creates a warm and moist environment with limited natural cleansing by saliva, which further enhances fungal growth. **Objective:** Therefore, efforts to reduce microbial colonization on denture base materials are important to improve oral hygiene and prevent denture-related infections. Chitosan, a natural biopolymer obtained from marine organisms, is known for its biocompatibility, biodegradability, and antimicrobial properties. **Novelty:** The novelty of this study lies in the incorporation of chitosan derived from vannamei shrimp (Litopenaeus vannamei) into heat-cured acrylic resin as a potential antifungal modification of denture base material. Methods/Results: This laboratory experimental study used a post-test-only control group design with 24 specimens. The specimens were divided into three groups: two treatment groups with heat-cured acrylic resin containing chitosan at 2.5% and 3%, and one control group without chitosan. The number of Candida albicans colonies was measured using a plate counting method. The results showed that the lowest colony count was observed in the 3% chitosan group, and followed by the 2.5% group, and statistical analysis demonstrated significant differences between the treatment and control groups. Novelty/Benefits: These findings indicate that the addition of vannamei shrimp (Litopenaeus vannamei) chitosan to heat-cured acrylic resin has the potential to reduce fungal colonization and may contribute to the development of denture materials that help prevent denture stomatitis and improve oral health among denture users.

Key Words: Candida albicans, chitosan, heat-cured acrylic resin, colony count, antifungal agent

ID 21155 Addition Nanochitosan Windu Prawn Shrimp Shells (Penaeus Monodon) on Heat-Polymerized Acrylic Resin in Transverse Strength

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Abstract

Background: Heat-polymerized acrylic resin is a dental material commonly used for fabricate dentures. It has advantages such as being relatively inexpensive, easy to process and having better aesthetics. **Problem Statement:** However, this material has weaknesses in mechanical strength, one of which is transverse strength, defined as the ability of an object to withstand an applied load or pressure. The addition of nanochitosan from windu prawn shrimp shells as a reinforcing material offers good biocompatible and biodegradable properties and is expected to increase transverse strength. **Objective:** This study aimed to analyze the effect of adding nanochitosan from windu prawn shrimp shells on the transverse strength in heat-polymerized acrylic resin. **Methods/Results:** To determine the homogeneity of the mixture, a Fourier Transform Infrared Spectrometry (FTIR) test was carried out. The study design used a posttest-only control group with 20 total samples of heat-polymerized acrylic resin which were divided into five groups. The control group K0 was unmodified heat-polymerized acrylic resins, K1 was heat-polymerized acrylic resins with zirconium oxide. P1, P2, and P3 were heat-polymerized acrylic resins with the addition of nanochitosan windu prawn shrimp shells atconcentrations of 0.5%, 1% and 1.5%, respectively. Transverse strength was tested using a Universal Testing Machine. The mean of transverse strength for groups K0, K1, P1, P2, and P3 in sequence was 104.38, 111.83, 110.07, 111.33, and 115.86. The mean of nanochitosan to windu prawn shrimp shells at a concentration of 1,5% (P3) was exceeded the transverse strength value of the positive control group (K1). Data analysis using One- Way ANOVA showed no significant differences at $p=0.837$ ($p>0.05$). **Novelty/Benefits:** This study concludes that the addition of nanochitosan of windu prawn shrimp shells (Penaeus Monodon) to heat-polymerized acrylic resin does not increase transverse strength.

Key words: Heat-polymerized acrylic resin, nanochitosan, transverse strength , windu prawn shrimp shells

ID 21156 The Nipon 1-1 Flipbook: A Bilingual Oral Health Education Tool for the Kadazandusun Community

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Abstract

Background: This project is a hybrid collaboration between dental professionals and a Kadazandusun language teacher to develop a bilingual product containing essential oral health education. Designed for chairside use both before and after treatment, this tool ensures that patients receive clear, detailed explanations of their oral health status. Establishing such clarity is fundamental to informed consent; in its absence, patients may fail to grasp the underlying causes of their oral health issues or the necessity of specific treatment procedures. **Problem Statement:** A significant communication gap exists when treating patients who are predominantly fluent in the Dusun language. This language barrier often results in a misunderstanding of dental problems and treatment procedures, leading to poor clinical outcomes, reduced patient compliance, and lower levels of health literacy within the local community. **Objective:** The Nipon 1-1 flipbook aims to facilitate the efficient and accurate delivery of dental information while fostering a proactive, quality-driven work culture in oral health education. By bridging the linguistic gap, the product improves two-way communication specifically with Dusun-speaking patients—thereby increasing overall patient satisfaction and fostering deeper engagement in their own dental care. **Novelty:** The Nipon 1-1 flipbook is the first bilingual product of its kind, specifically tailored for the Dusun-speaking community. Its novelty lies in its community-centric design, merging language accessibility with clinical expertise. The content, covering 24 key topics, was rigorously validated using the Patient Educational Material Assessment Tool (PEMAT) to ensure the information is concise, simplified, and highly accessible for users of all literacy levels. **Benefits:** By implementing a “Close to Community” (Malay–Dusun) concept, this product empowers patients through improved health literacy and shared decision-making. The project has proven highly replicable,having been adopted by the Ranau Dental Clinic and various facilities under the Kota Belud District Health Office. The team hopes that this innovation will be utilized by dental officers across the state of Sabah, with the flexibility to update content regularly to remain relevant to evolving community needs. Furthermore, its distribution to primary school libraries, such as SK Pekan 1, provides early oral health exposure to students, ultimately aiming to promote equitable access to healthcare information for indigenous populations.

Key words: Bilingual Flipbook, Community-Based Innovation, Dental Health Education, Kadazandusun and Oral Health Literacy

ID 21157 Dental Restoration-Band: A Wearable Innovation Revolutionising Solo Dentistry

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Abstract

Introduction & Problem Statement: Critical shortages in dental workforce compel practitioners to perform solo dentistry. Unfortunately, this negatively affects procedures that require four-handed dentistry. As resin-based composites have become the primary restorative solutions for decayed tooth, solo dentistry further affects the quality of restoration. Another drawback of solo dentistry is occupational hazard due to repetitive work nature (physical strain). **Objective:** To mitigate this problem, an innovation called 'Dental Restoration Band' (DRB) was created to optimize solo workflow. **Innovation & Novelty:** DRB accommodates placement of restorative material at a more comfortable distance to the practitioner (on the wrist). The rubber-based wrist band has a 'snap-on' feature which eases wearability and removal. The band houses detachable composite box (CB) for ease of cold sterilization. The CB is attached to the light cure shield which protects material from premature polymerization (setting) and contamination. In addition, DRB is cost- effective as it only incurs RM12 in production. **Innovation Benefits:** DRB reduces the need of four-handed dentistry especially when performing dental restorations and ensures the optimum quality of filling. It also prevents repetitive movements and enhances work comfort. Feasibility testing reported use of DRB was able to save approximately 2-3 minutes of work time per restoration and reduces practitioner fatigue. **Conclusion:** Through utilization of DRB, solo dentistry can be maximized, quality of filling be optimized and practitioners occupational health be safeguarded.

Key words: Solo dentistry, composite restoration, occupational health

ID 21158 iMPON: Senyuman Sihat Sepanjang Hayat – An Oral Health Education Kit

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Abstract

Background: Early Childhood Caries (ECC) is defined by the presence of caries in the primary dentition of children under the age of six. It is one of the most prevalent, yet preventable, early childhood diseases globally. Though often trivialized by the public, ECC has a proven detrimental impact on children, families, and society, with adverse effects on general health and quality of life extending into adulthood. Findings from The National Oral Health Survey of Preschool Children 2015 indicate that rural Bumiputera communities in East Malaysia are disproportionately affected, illustrating a crucial need for targeted intervention. Current guidelines promote early intervention with caregivers through Dental Therapists (DT) at Klinik Desa (KD), where the success of these programs rests on the caregiver, who serves as the primary gatekeeper and provider of the child's oral healthcare. **Problem Statement:** Despite the critical role of caregivers, their engagement with dental services is often restricted by staffing shortages and geographical barriers in rural areas. Consequently, many expectant mothers and young children slip through the cracks of the traditional dental healthcare system. This represents a significant missed opportunity to involve Jururawat Masyarakat (JM)—the healthcare providers most frequently in contact with caregivers —in delivering essential oral health education, despite being non-dental professionals. **Objective:** We developed iMPON, a user-friendly oral health education kit designed for use at the community level. It comprises a portable bag containing a large teeth model, mirror, oral hygiene implements, flashcards, a manual, and a QR code linking to an informative website detailing toddler oral healthcare. **Novelty:** Currently, no dedicated oral health promotion kits exist for KDs. iMPON leverages the JM's role as a key community figure to bridge the gap in dental health promotion. The integration of a QR code ensures information remainshighly accessible, while hands-on sensory learning encourages engagement and long- term retention for both mother and child. **Benefits:** iMPON provides a consistent accessible source of early education for caregivers, building awareness and successfully integrating oral health into existing maternal and child healthcare frameworks.

Key words: Caregiver Engagement, Early Childhood Caries, East Malaysia, Jururawat Masyarakat, Oral Health Education

ID 21159 DENTAL PICTOVISUAL GUIDE

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Abstract

Background: Effective communication between dentists and patients is essential for successful diagnosis, treatment planning, and patient compliance. However, studies indicate that nearly 60% of patients misunderstand dental explanations, which may negatively affect treatment adherence and clinical outcomes. This issue is particularly significant in multicultural regions such as Sabah, Malaysia, where patients come from diverse ethnic backgrounds and speak different languages. Language barriers, cultural differences, and low health literacy often hinder patients from fully understanding their oral health conditions and recommended treatments. **Problem Statement:** Dental practitioners frequently encounter communication barriers when explaining diagnoses, treatment options, and post-operative instructions to patients with limited language proficiency. Misinterpretation of medical terminology and inadequate understanding of treatment procedures can lead to poor compliance, anxiety, and reduced acceptance of dental treatment. These challenges highlight the need for an effective and accessible communication tool to bridge the gap between dental professionals and patients. **Objective:** This project aims to develop the Dental Pictovisual Guide (DPG), an innovative communication tool designed to enhance dentist–patient interaction by integrating visual-audio illustrations with multilingual explanations. **Novelty:** The DPG introduces a chairside e-flip chart communication system that combines clinical illustrations, simplified terminology and multilingual text including Malay and local dialects such as Tidung, Bugis, and Bajau. The system incorporates digital features such as QR codes, audio explanations, and interactive visual aids to support patients with different literacy levels. By functioning as a visual translator, the DPG allows patients to better understand symptoms, diagnoses, treatment procedures, risks, and post-operative care instructions. **Benefits:** The DPG improves patient comprehension, promotes shared decision-making, and enhances treatment adherence. It also reduces patient anxiety, supports informed consent, and improves satisfaction with dental services. For dental professionals, the guide standardizes communication, reduces chairside explanation time, and facilitates education during consultations. Ultimately, this innovation contributes to improved oral health literacy and equitable access to dental care, particularly in multicultural communities.

Key words: Dental health education, Diversity, Equity, Oral health literacy & Treatment adherence

ID 21160 ChitoCal: A Breakthrough in Periodontal Bone Regeneration

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Abstract

Background: The loss of the tooth-supporting structure, known as the periodontium, in the advanced case of periodontitis is unfortunately inevitable. Restoring the periodontal apparatus remains a true challenge for clinicians, as it requires the coordinated restoration of alveolar bone, periodontal ligament, and cementum. **Problem Statement:** Existing regenerative materials may not fully satisfy the need for a scaffold that is both structurally favorable and biologically compatible. **Novelty:** To address this gap, ChitoCal, a novel composite scaffold combining calcium sulfate and chitosan, was developed as an innovation for periodontal regenerative modalities. The rationale behind ChitoCal is centered on the synergistic combination of both materials. Calcium sulfate contributed to the osteoconductive effect and space-maintaining capacities, while chitosan offers biocompatibility, biodegradability, and a favorable surface for cellular interaction. A key innovation of this scaffold is its porous architecture, which is essential for tissue regeneration. Adequate porosity supports cell attachment, migration, nutrient exchange, vascular infiltration, and new tissue ingrowth, all of which are critical for periodontal wound healing. The composite is intentionally designed to produce a microenvironment that better resembles the trabecular nature of alveolar bone. Beyond structural properties, cell viability is a crucial factor in determining scaffold performance. ChitoCal demonstrated a favorable viability profile, indicating that the composite is capable of supporting cellular survival and maintaining a biologically acceptable environment. This suggests that the scaffold is not only structurally suitable but also compatible with the early cellular events required for regeneration. **Benefit:** Overall, ChitoCal represents a promising biomaterial innovation that integrates porosity and viability into one composite scaffold system. By offering both a supportive framework for tissue ingrowth and a surface conducive to cellular response, ChitoCal has the potential to advance the future of periodontal bone regenerative therapy.

Key words: Periodontitis, periodontal regeneration, calcium sulfate, chitosan, scaffold

ID 21161 Voice-Activated Dental Charting (MyVAI Dental)

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Abstract

Background/Problem Statement: Manual dental charting remains widely practised in Malaysia, yet it is often time-consuming, prone to human error, and disruptive to patient-centred care. Dentists frequently pause during procedures to record findings or rely on Dental Surgery Assistants, and workforce limitations further increase workload and reduce efficiency. **Objective:** This study aimed to develop and evaluate MyVAI Dental, a voice-activated dental charting system that enables real-time, hands-free clinical documentation. **Methods/Results:** The system converts spoken dental findings into structured digital records instantly, allowing an uninterrupted workflow and continuous clinician–patient interaction. A pilot comparative study was conducted with two groups of patients (n=30), with one group undergoing conventional manual charting and the other using the MyVAI system. The findings showed that MyVAI Dental reduced charting time by approximately 28%, decreasing the average documentation time from 3.00 minutes to 2.16 minutes. In terms of diagnostic accuracy, the system achieved a high level of agreement with manual charting (kappa = 0.94), comparable to the manual method (kappa = 0.96). Additionally, patient satisfaction was higher in the MyVAI group (85%) than in the manual group (65%), reflecting improved communication and engagement during clinical procedures. **Novelty:** The novelty of this innovation lies in its ability to interpret dental-specific terminology and generate structured chart entries in real time, offering a practical solution not widely implemented in Malaysian dental settings. **Benefits:** Overall, MyVAI Dental enhances efficiency, maintains high accuracy, and improves the patient experience, supporting its potential as a scalable and patient-centred solution for modernising oral healthcare delivery.

Key words: Artificial intelligence, Dental charting, Natural language processing, Speech recognition, Voice-activated system

ID 21162 PerioXpert by UiTM : Scan. Learn. Care

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Abstract

Background: Periodontal disease is a prevalent, silent, and progressive condition that not only leads to tooth loss but also shares profound systemic links with diabetes, cardiovascular diseases, and adverse pregnancy outcomes. **Problem Statement:** Despite professional intervention, the successful management of periodontitis relies heavily on strict at-home oral hygiene practices. However, traditional Oral Hygiene Instructions (OHI) often depend on generic, easily discarded pamphlets or purely verbal communication, resulting in poor patient retention, inadequate plaque control, and a lack of understanding regarding the critical mouth-body connection. **Objective:** To address this gap, this project introduces the "PerioXpert by UiTM," an interactive, easily accessible digital educational platform designed to empower periodontal patients through structured knowledge and actionable self-care routines. **Novelty:** Accessible instantly via a QR code, the novelty of PerioXpert by UiTM lies in its comprehensive, highly visual, and patient-centric digital interface. It systematically guides users from basic anatomy and disease progression to systemic risk factors and specialized plaque control techniques, such as the Modified Bass method and interdental brushing. Furthermore, it bridges the gap between digital education and physical habit-building by providing a downloadable "Mirror Companion" daily checklist, transforming passive learning into active, daily compliance. **Benefits:** By enhancing periodontal health literacy and practical self-care efficacy, the PerioXpert by UiTM offers significant benefits to society. It directly aids in reducing the incidence of severe tooth loss and mitigates the systemic health burdens associated with chronic oral inflammation. Ultimately, this innovation empowers patients to take long-term ownership of their holistic health, fostering better community well-being and potentially reducing broader healthcare costs through preventive, patient- led care

Key words. Digital Education; Oral Hygiene; Patient Compliance; Periodontal Disease; Systemic Health.

ID 21163 OrthoCOMIG: A Customized Guide for Accurate, Safe and Predictable Orthodontic Mini-Implant Placement

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Abstract

Background: Orthodontic mini-implants have become an essential tool in modern orthodontics, offering effective skeletal anchorage and expanding treatment possibilities. However, their clinical success is highly dependent on precise placement, including optimal angulation, depth, and positioning relative to adjacent anatomical structures. **Problem Statement:** Despite their widespread use, mini-implant placement remains a technique-sensitive procedure associated with several challenges. These include the risk of root damage, inaccurate angulation and depth control, prolonged chairside time, and variability in outcomes among clinicians with different experience levels. Such limitations can compromise patient safety, reduce procedural efficiency, and affect treatment predictability. **Objective:** This project aims to develop OrthoCOMIG, a customized orthodontic mini-implant guide designed to improve the accuracy, safety, and predictability of mini-implant placement while reducing technique sensitivity and operator dependency. **Novelty:** OrthoCOMIG is a patient-specific guiding system developed using digital 3D planning and advanced fabrication techniques (CAD/CAM). It enables precise control over implant angulation, depth, and insertion site, ensuring standardized and reproducible placement. Unlike conventional freehand techniques, this innovation minimizes human error and enhances clinical precision through guided insertion. **Benefits:** OrthoCOMIG reduces the risk of root injury and placement errors, shortens chairside time, and improves consistency across clinicians. For patients, it enhances safety, reduces discomfort, and improves overall treatment outcomes. For clinicians, it simplifies the procedure and increases confidence in implant placement. Broadly, this innovation supports the advancement of precision-driven orthodontics, contributing to improved standards of care and reducing complications associated with improper mini-implant placement.

Key words: 3D and CAD/CAM designed, customized mini-implant guide, orthodontic treatment.

ID 21164 PathoClick AI: Evolving Microscopy into Mentorship

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Abstract

Background/Problem Statement: PathoClick AI redefines digital pathology by evolving static slide repositories into a dynamic, AI-mentored learning ecosystem. While existing tools provide remote access to laboratory materials, they lack the interactive depth of instructor-led sessions, specifically in facilitating real-time diagnostic reasoning. **Objective:** This project addresses this gap by integrating structured clinical workflows with slide-anchored discussion pins and lecturer-driven annotations. Central to the platform commercial value are the "Context-Aware AI Tutor" and "Socratic Diagnostic Reasoning Guide". **Methods:** These tools leverage lecturer-provided content to simulate expert mentorship, guiding students through structured reasoning rather than delivering direct answers. Each session begins with case-oriented quizzes to prime students for deeper engagement, reinforcing learning continuity and diagnostic accuracy. **Novelty:** Designed for high scalability, PathoClick AI's framework is adaptable to any case-based learning discipline across medical, dental, and allied health education. Currently in the proposal stage, the platform transforms digital pathology from a passive content repository into an active, data-driven environment. **Benefits:** It offers a premium educational solution that provides institutions with actionable insights into student learning patterns while fostering the higher-order reasoning skills essential for modern clinical practice.

Keywords: Virtual Microscopy, AI-Augmented Pedagogy, Diagnostic Reasoning, Scalable EdTech, Interactive Pathology

ID 21165 Entrepreneurship and Management in Dentistry: A Practical Guide

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Abstract

Background: Business in dentistry represents a convergence business strategy, management and clinical expertise. As oral healthcare evolves from a traditional service- oriented model into a multifaceted healthcare enterprise, there is an increasing need to translate scientific knowledge into practical and sustainable clinical practice supported by entrepreneurial and managerial competencies. This shift aligns with the broader movement of transforming knowledge through innovation by integrating science, technology, and real-world application. Problem Statement: Despite advancements in dental education and clinical training, there remains a significant gap in the integration of business and management competencies within dental curricula. Oral health care practitioners lack formal training in areas of practice establishment, financial planning, marketing, and clinic management, which are essential for sustaining and growing modern dental practices. **Objective:** This book aims to develop an innovative educational module titled Business in Dentistry, designed to integrate clinical dentistry with entrepreneurial and managerial competencies. The chapters seek to bridge the gap between theoretical knowledge and practical application by equipping dental professionals with the skills required to effectively manage and operate within contemporary healthcare environments. **Novelty:** The innovation lies in the development of a comprehensive, interdisciplinary book that systematically integrates clinical dentistry with business and management principles. Unlike traditional curricula, this module combines key domains such as entrepreneurship, practice establishment and ownership, financial planning, marketing and branding, and clinic management into a structured learning framework. It is aligned with the conference theme, "Transforming Knowledge through Innovation: Bridging Science, Technology, and Practice". **Benefits:** By equipping dental professionals with entrepreneurial and managerial competencies, this initiative enhances the quality, accessibility, and sustainability of oral healthcare practices. It supports the development of efficient and patient-centered dental practices, promotes innovation in service delivery, and contributes to improved healthcare access. Ultimately, it strengthens the long-term viability of the dental profession and fosters a more resilient and responsive healthcare system.

Keywords: Dental entrepreneurship, Practice management, Innovation in dentistry, Dental education and leadership, Healthcare business models.

ID 21167 OSA EduTube: A Multidisciplinary, Multilingual YouTube-Based Patient Education Innovation for Obstructive Sleep Apnoea

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Abstract

Background: Obstructive sleep apnoea (OSA) is a common but under-recognised disorder associated with excessive daytime sleepiness, impaired quality of life, road traffic accidents, and cardiometabolic complications. **Problem Statement:** Despite its clinical importance, public awareness remains poor. Many individuals consider snoring to be normal, do not recognise key symptoms, and are unfamiliar with available treatment options such as continuous positive airway pressure (CPAP) therapy and mandibular advancement devices. Conventional counselling during clinic visits is often limited by time and may not provide patients with accessible, revisitable education. A scalable and patient-centred educational innovation is needed to bridge this gap. **Objective:** To develop a multidisciplinary, multilingual, specialist-led digital education platform using YouTube videos to improve awareness, understanding, and engagement in OSA care. **Methods:** OSA EduTube is a structured patient education innovation developed collaboratively by a respiratory specialist and dental specialist team. It consists of short, easy-to-understand YouTube videos in multiple languages, designed for patients, caregivers, and the public. The content covers symptoms, risk factors, complications, diagnosis, CPAP therapy, oral appliance therapy, lifestyle measures, and common misconceptions about OSA. The innovation extends education beyond clinic walls through a low-cost, scalable, and widely accessible platform. QR codes can be incorporated into clinic posters, brochures, and appointment cards to facilitate direct access. **Novelty/Benefits:** This innovation combines multidisciplinary expertise with digital health education in a reusable, standardised format. Unlike conventional one-off counselling, the platform allows repeated viewing, family involvement, and broader community outreach. The integration of respiratory and dental perspectives is particularly valuable in highlighting the full spectrum of OSA management. The innovation is expected to improve OSA literacy, encourage earlier referral and diagnosis, support shared decision-making, and enhance acceptance of therapy. It also has potential for adaptation across hospitals, dental clinics, sleep centres, and public health campaigns. OSA EduTube is a practical, socially relevant, and scalable educational innovation that addresses an important gap in OSA awareness and patient engagement. It offers a sustainable model for multidisciplinary digital patient education in sleep medicine.

Keywords: Continuous positive airway pressure, Digital health Education, mandibular advancement devices, Obstructive Sleep Apnoeahip, Healthcare business models.

ID 21169 Exploring the Features for AI-Powered App in Delivering Oral Health Messages to Hearing Impaired Patients

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Abstract

Introduction: Hearing-impaired individuals often face barriers to oral health information, as dental education relies heavily on verbal communication. Caregivers frequently need to bridge these gaps, increasing their monitoring responsibilities. Although Artificial Intelligence (AI) offers great potential for accessible, personalised oral health education, evidence on AI-based interventions for hearing-impaired populations in Malaysia is limited. **Objective:** This study aimed to determine the oral hygiene practices among hearing-impaired patients and the caregiver roles in daily oral hygiene care, to identify the challenges and needs of hearing-impaired patients and their caregivers in receiving and delivering oral health messages and to explore the AI-powered app features, recommendations, and expectations among the caregivers and hearing-impaired patients. **Methods:** A semi-structured interview was conducted with four hearing-impaired patients and four caregivers, lasting 30-45 minutes each session. Participants were purposively recruited through hearing-impaired support organisations in Malaysia. **Results:** Thematic analysis identified five themes for hearing-impaired patients and three themes for caregivers. Patients practiced regular oral hygiene but had limited technique awareness and independence, relying on caregivers for supervision and communication. They faced communication barriers, preferred visual learning, and showed readiness to use AI apps. Caregivers played key educational roles but faced sign language limitations, resulting in communication and emotional dependence. Both groups recommended AI apps with visual, interactive, affordable, and communication-bridging features. **Novelty/Benefits:** This study is among the first in Malaysia that integrate perspectives of both hearing-impaired individuals and caregivers in designing AI-driven oral health education. It utilizes the user-centred approach in creating digital health innovation tailored for the marginalised population. **Conclusion:** Communication barriers reduced effective oral health education and patient independence, increasing caregiver reliance. An AI-powered oral health application with visual content, sign language support, interactive learning, and affordable access may enhance patient independence while supporting caregiver monitoring and reducing communication burden.

Keywords: AI-powered Applications, Communication Barriers, Hearing Impairment, Oral Health Education, Visual learning

ID 21170

PetraMatrix: Development of a Novel White Petrolatum-Based Antibiotic Paste for Root Canal Disinfection

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Abstract

Background/Problem Statement: The choice of vehicle plays an important role in determining the physical behaviour, handling, and clinical usefulness of antibiotic pastes for root canal disinfection. **Objective:** This study describes the development of a white petrolatum (WP)-based intracanal antibiotic paste prototype as an alternative vehicle system and its preliminary physicochemical evaluation against a conventional formulation prepared with macrogol and propylene glycol. Prototype formulations included WP DAP, WP TAP-doxy, and WP TAP-mino, with MP DAP serving as the reference formulation. Particle size analysis was used to assess dispersion characteristics, while oscillatory rheometry was performed to evaluate viscoelastic behaviour and structural stability. The findings showed that particle dispersion was influenced by both vehicle type and antibiotic composition. WP DAP and WP TAP-doxy demonstrated more favourable particle size distribution profiles, indicating finer and relatively more homogeneous dispersion, whereas WP TAP-mino exhibited a broader and more heterogeneous distribution with a greater coarse particle fraction. Statistical analysis confirmed significant intergroup differences in particle size distribution characteristics, with WP TAP-mino differing significantly from the reference formulation in selected parameters. **Novelty:** Rheological assessment further showed that all formulations exhibited predominantly elastic, solid-like behaviour within the linear viscoelastic region, indicating structural stability under low deformation. Although the WP-based formulations generally appeared more rigid than the MP-based control, these differences were not statistically significant. **Benefits:** Overall, these findings suggest that the WP-based prototype may offer a readily available, lower- cost, and chemically stable alternative for intracanal application in endodontic treatment.

Key words: antibiotic paste, particle size distribution, rheology, root canal disinfection, white petrolatum

ID 21171 AI-Powered Storytelling for Early Childhood Dental Health Education

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Abstract

Background/Problem Statement: Dental anxiety remains a significant challenge in paediatric dentistry, often manifesting as uncooperative behaviour during dental procedures. The Frankl Behaviour Rating Scale is a widely used tool to assess child cooperation during dental visits. AI-driven storytelling interventions, such as animated bilingual narratives, may serve as effective behaviour modification tools prior to dental extraction. **Objective:** This study aimed to evaluate the effect of the Mouth Ville: AI-powered animated storytelling intervention on the cooperative behaviour of preschool children undergoing dental extraction, as measured by the Frankl Behaviour Rating Scale. **Methods/Results:** A pilot study was conducted involving 10 paediatric patients scheduled for dental extraction. Frankl behaviour scores were recorded at baseline (pre-intervention) and immediately following dental extraction (post-intervention). All patients presented with a Frankl score of 2 (negative) at baseline. Following exposure to the Mouth Ville animated bilingual storytelling intervention, Frankl scores were recorded. Data were analysed using the Wilcoxon signed-rank test, with statistical significance set at $p < 0.05$. Of the 10 patients, 8 (80%) demonstrated an improvement in Frankl score from 2 (negative) to 4 (definitely positive) following the intervention, while 2 patients (20%) maintained a score of 3 (positive) with no change. Overall, the intervention was associated with a statistically significant improvement in cooperative behaviour ($p = 0.008$), indicating that the Mouth Ville storytelling tool effectively enhanced child cooperation during dental extraction. **Novelty:** The Mouth Ville: AI-driven bilingual storytelling intervention significantly improved cooperative behaviour in preschool children undergoing dental extraction, as reflected by meaningful gains in Frankl Behaviour Rating Scale scores. **Benefits:** These findings support the integration of AI- powered narrative tools as a non-pharmacological behaviour management strategy in paediatric dental settings.

Key words: AI storytelling, behaviour management, dental anxiety, Frankl scale, paediatric dentistry, dental extraction

ID 21172 Annatto Tocotrienol: A Dual-Action Innovation for Oral and Cardiovascular Health

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Abstract

Background: Periodontitis and hypertension are two major chronic health conditions that continue to place a significant burden on individuals and healthcare systems worldwide. Periodontitis causes progressive destruction of the tissues and bone supporting the teeth, while hypertension is a major contributor to cardiovascular disease. Growing evidence suggests that these conditions may be biologically linked through shared inflammatory and vascular disturbances. When both occur together, they may reinforce one another and worsen overall health outcomes. **Problem Statement:** Despite this important connection, oral health and systemic health are still often managed separately, highlighting the need for more integrated and innovative approaches. **Objective:** This study aimed to explore the potential of annatto tocotrienol as a dual-action intervention in a preclinical model of concurrent hypertension and periodontitis. **Novelty:** The novelty of this work lies in its being the first study to investigate annatto tocotrienol in the combined setting of hypertension and periodontitis, offering a new approach that bridges oral health and cardiovascular health within a single innovation framework. The findings demonstrated promising protective effects, with annatto tocotrienol helping to reduce blood pressure elevation and preserve the bone supporting the teeth in the presence of both hypertension and periodontitis. **Benefits:** These outcomes highlight its potential as a dual-action innovation that may support both oral health and cardiovascular well-being simultaneously. More importantly, this project introduces a broader healthcare perspective by showing how a single intervention can be explored for two biologically linked chronic conditions rather than addressing them separately. From a societal perspective, this work shows promise as a foundation for future research on supportive oral-systemic health solutions for individuals affected by both gum disease and hypertension. By highlighting the close relationship between oral health and general health, it may support more integrated thinking in healthcare innovation.

Keywords: annatto, hypertension, periodontitis, tocotrienol

ID 21173 Endo3DT: 3D-Printed Tooth Models for Endodontic Competency Training

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Abstract

Background: Endodontic training and competency assessment require models that are anatomically realistic, standardized, and safe for repeated use. **Problem Statement:** Conventional use of extracted human teeth remains limited by anatomical variability, inconsistent availability, infection control concerns, ethical issues, and difficulty in ensuring fair comparison between learners. Existing synthetic tooth models are more accessible, but they often fail to reproduce natural crown morphology, internal root canal anatomy, and realistic tactile response during operative procedures. **Objective:** This project aims to develop and validate an anatomically accurate three-dimensional printed mandibular premolar tooth model for endodontic competency assessment. **Methods:** The innovation integrates a modular crown–root design fabricated entirely using stereolithography (SLA) 3D-printed resin materials, in which the crown segment is engineered to simulate enamel-like cutting resistance, while the root segment is reconstructed from high-resolution micro-computed tomography data to replicate the pulp chamber and root canal morphology. The study is conducted in two phases. The first phase involves prototype development and laboratory evaluation of mechanical properties through Vickers hardness and flexural strength testing against natural enamel and dentine. The second phase involves expert validation by endodontists who assess anatomical realism, tactile feedback, educational suitability, and overall performance of the model during simulated endodontic procedures. **Novelty:** The novelty of this project lies in integrating anatomical fidelity, material-specific modular construction, and validation for competency-based assessment within a single educational tool. **Benefits:** This model is expected to provide a reproducible and ethically sound alternative to extracted teeth, improve fairness and standardization in simulation-based learning, support readiness for professional competency examinations, and offer future potential for wider institutional use, scalable production, and commercialization in dental education.

Key words: competency assessment; endodontics; simulation-based education; three-dimensional printing; tooth model

ID 21174 Quit Game: Enhancing Oral Cancer Education Through Digital Gamification

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Abstract

Background/Problem Statement: Oral cancer remains a significant public health concern, with increasing prevalence driven by modifiable risk factors such as smoking, vaping, alcohol consumption, and betel quid chewing. As younger populations become more immersed in digital and interactive environments, oral health education must evolve to adopt technology-driven approaches that align with contemporary learning behaviours and support effective prevention and early detection. **Objective:** As part of an oral cancer awareness programme conducted in conjunction with Mouth Cancer Awareness Month, this project introduces Quit Game, an interactive video game designed to deliver oral cancer education in an engaging and accessible format. The innovation integrates gamification into health promotion to enhance knowledge, engagement, and behavioural awareness. It aims to improve understanding of risk factors, preventive practices, early detection, and to address common misconceptions related to oral cancer among adolescents and technology-oriented adults. **Methods/Results:** A pre–post interventional study was conducted among participants from diverse demographic backgrounds. The game was delivered across multiple digital devices and was accessible both online and offline, with participation monitored by designated personnel. Knowledge levels were assessed using structured pre- and post-test questionnaires, with 163 participants completing both assessments. Data analysis indicated a non-normal distribution (Shapiro–Wilk $p<0.001$), and the Wilcoxon Signed Rank Test showed a statistically significant improvement in knowledge scores ($p<0.001$) The median score increased from 3.0 (IQR = 2.00- 4.00) pre-intervention to 6.0 (IQR = 6.00-7.00) post-intervention. These findings highlight the effectiveness of embedding gamified learning within oral cancer awareness programmes to enhance understanding of risk factors and correct common misconceptions, particularly those related to vaping and traditional practices. **Novelty:** The novelty of Quit Game lies in its integration of behavioural science principles with digital engagement to deliver impactful health education. Its offline functionality further enhances accessibility in low-resource or limited-connectivity settings, supporting integration into community outreach, school-based programmes, and national preventive initiatives. **Benefits:** This approach offers a scalable and innovative strategy for public health promotion, with broader applicability to non-communicable disease prevention strategies.

Key words: Dental public health, Gamification, Health education, Oral cancer, Prevention.

ID 21175 iBPouch: Development of a Dual Channel Buccal Pouch Cleaner for Hyposensory Patients

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Abstract

Background: Food retention within the buccal pouch is a frequently overlooked problem in patients with reduced oral sensory awareness, impaired oral clearance, and dependence on assisted feeding or oral hygiene care. Undetected food debris lodged between the teeth and cheek increases the risk of halitosis, mucosal irritation, prolonged feeding time, choking, and aspiration pneumonia, while also contributing to caregiver burden. **Problem Statement:** Current management strategies, including manual inspection, finger sweeping, and conventional suction, are often inconsistent, technique- sensitive, and not specifically designed to safely access the buccal vestibule. Objective: This project presents iBPouch, a novel handheld device designed to facilitate safe and effective buccal pouch clearance. **Methods/Novelty:** The device features an ergonomic handle and a soft, flexible U-shaped retractor tip that gently displaces the cheek to enhance visibility and access. A dual-channel system integrates targeted irrigation to loosen retained debris with simultaneous suction for efficient removal. Additionally, a soft silicone wiping edge enables atraumatic mechanical clearance without sharp components. By combining cheek retraction, controlled irrigation, suction, and gentle wiping into a single device, iBPouch streamlines the oral clearance process and reduces reliance on multiple techniques. This integrated approach enhances safety, efficiency, and user comfort during assisted oral care. **Benefits:** The proposed innovation addresses a clinically neglected need in special care dentistry and has potential applications in rehabilitation settings, institutional care, and home-based caregiving.

Key words: aspiration pneumonia, buccal pouching, hyposensory patients, oral care device, special care dentistry

ID 21178 Brush & Play: A Puppetry Adventure for Little Teeth

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Abstract

Background/Problem Statement: Tooth decay in young children is a major health problem in Malaysia, where roughly six out of ten five-year-olds suffer from cavities. This widespread issue often stems from a lack of knowledge about proper oral hygiene and a significant fear of visiting the dentist, both of which prevent early intervention. Traditional teaching methods, like using standard slideshows or static plastic models, often fail to capture a child's imagination and do not lead to long-lasting habits. To tackle this, we developed "Brush & Play," a vibrant and interactive dental health kit designed specifically for kids. **Objective:** The primary goal of this project is to use the magic of puppetry to teach children aged four to eight how to brush their teeth correctly. By turning a clinical lesson into a playful adventure, we can significantly reduce dental anxiety and improve our little ones' overall health and well-being. What truly sets this kit apart is the use of relatable puppet characters that children can bond with. To ensure our messages are as impactful as possible, we integrated Artificial Intelligence (AI) technology to assist in creating highly engaging storyboards. This AI-driven approach helps us craft narratives that are easy for young minds to follow and remember. **Novelty:** Built with sustainable and recycled materials, these kits harness the power of storytelling and repetition to make healthy habits second nature. **Benefits:** This initiative directly supports Malaysia's national health goal of increasing the number of cavity-free children by the year 2030. By rolling out these edutainment kits in schools and community clinics, we aim to prevent painful dental issues before they start, saving families from the high costs of emergency treatments. Ultimately, "Brush & Play" is about more than just teeth; it is about helping a new generation of Malaysian children grow up with the confidence of a healthy, happy, and cavity-free smile.

Keywords: Caries Prevention, Edutainment, Educational Puppetry, Oral Health Promotion, Paediatric Dentistry

ID 21180 A Multifunctional Bioactive Saliva for Pulp Preservation and Orthodontic–Prosthodontic Biofilm Modulation

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Abstract

Background: Saliva serves as the primary natural defense of oral cavity by providing lubrication, buffering capacity, and antimicrobial protection to maintain oral tissue integrity and homeostasis. During dental emergencies, particularly situations where immediate professional care is not readily accessible, the absence of an appropriate preservation medium may compromise the viability of oral tissues and avulsed teeth. Therefore, it highlights the need for a readily available, standardised storage medium capable of preserving dental structures. Therefore, an artificial saliva formulation with a fixed and physiologically compatible composition may serve as a reliable emergency reserve. **Problem statement:** Dental avulsion is a severe traumatic dental injury characterised by the complete displacement of a tooth from its alveolar socket, resulting in immediate disruption of the periodontal ligament, pulpal neurovascular supply, and supporting alveolar structures. Although immediate reimplantation remains the gold standard for optimal, it is often impractical in real-world emergency situations due to delayed access to dental care, patient-related factors, or inappropriate handling at the site of injury. Consequently, a suitable storage medium is essential to preserve pulpal vitality and maintain the viability and regenerative capacity of periodontal ligament (PDL) cells prior to treatment. Objectives: (1) To evaluate the antimicrobial properties of SalivBGuard© using agar diffusion assay. (2) To assess the anticandidal efficacy of SalivBGuard© using disk diffusion assay. **Novelty:** SalivBGuard© is a biomimetic formulation designed to preserve pulp vitality while exhibiting antibacterial and anticandidal properties tailored to function as a universal storage medium for avulsed teeth. Its multifunctional design distinguishes it from conventional storage solutions by integrating both protective and therapeutic capabilities. **Benefits:** This innovation represents a shift from single-function products to a comprehensive bioactive saliva platform, bridging preventive care, prosthetic hygiene, and regenerative support. The proposed system demonstrates strong translational potential for clinical dentistry, emergency management, and community oral healthcare. Ultimately, this technology aims to improve quality of life by enhancing tooth survival rates, reducing the need for complex dental treatments, and restoring oral function, aesthetics, and self-confidence, particularly among children.

Key words: Artificial saliva, Pulp preservation, Dental trauma, anticandidal

ID 21181 ByteWise: ByteWise ; Basic Yet Thoughtful Evaluation, Wise, Indication-based, Simple and Easy Digital Website for Clinical Decisions

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Abstract

Background/Problem Statement/Objective: ByteWise is an innovative digital platform designed to support and standardise treatment planning in dentistry. The system integrates essential clinical parameters commonly used in routine dental practice, particularly within structured healthcare settings such as government dental clinics and teaching hospitals which are the Oral Hygiene Assessment using O'Leary Plaque Score, Basic Periodontal Examination (BPE), and International Caries Detection and Assessment System charting (ICDAS). ByteWise also include the Restorative Difficulty Evaluation System (RDES) for advanced caries cases. The intrinsically subjective nature of dental treatment planning necessitates this innovation. Dentistry mainly depends on clinical judgement and chairside evaluations, in contrast to medicine, where diagnoses are frequently confirmed by comprehensive investigations including blood tests and imaging modalities. Particularly for students and early-career physicians, this diversity may result in inconsistent treatment choices. By offering an organised, indication-based framework that guarantees crucial treatment steps are not missed, Bytewise fills this gap and encourages methodical, repeatable clinical decision-making. **Novelty:** Bytewise's emphasis on evidence-based guidance without relying on artificial intelligence is one of its most distinctive features. The platform serves as a cognitive assist, guiding users through verified indices and organised procedures, rather than taking the place of clinical judgement. By helping clinicians assess the prognosis of severely weakened teeth, RDES further improves patient safety by lowering the possibility of overtreatment or unnecessary therapies. **Benefits:** Bytewise has the ability to increase dental care delivery's effectiveness, consistency, and safety.

Key words: ByteWise, Digital Platform, Treatment Planning in Dentistry

ID 21182 Developing Artificial Intelligence Prototype for Classifying Crude Stingless Bee Propolis towards Innovation in Dentistry

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Abstract

Background/Problem Statement: Stingless bee (SLB) propolis demonstrates excellent therapeutic properties and innovative applications in dentistry. Its diverse bioactive compounds contribute to synergistic therapeutic effects, supporting potential uses in oral health. However, morphology of propolis differs uniquely across bee species that may influence its nutraceutical efficacy in future dental formulations. **Objective:** To create an Artificial Intelligence (AI) prototype to classify three SLB species, Geniotrigona thoracica (GT), Heterotrigona itama (HI), and Tetrigona apicalis (TA), via SEM images. **Methods/Results:** Crude propolis was acquired from Raub, Pahang. Standardized SEM imaging of crushed samples were performed to generate a reproducible dataset. The original dataset of 18 micrographs (six images per species) was augmented by generating approximately 50 additional images per species via transformation such as flipping, scaling, and rotation. MobileNet was trained and fine-tuned with varying dataset sizes and epochs, and the performance was evaluated using accuracy, precision, recall and F1 score. Initial experiment with a small dataset achieved accuracy of 0.67, while augmentation improved the accuracy to 0.86 after 80 epochs, along with higher precision (0.91), recall (0.87), and F1 score (0.86). The trained model was integrated into a prototype with a graphical user interface (GUI), enabling users to classify new macerated SEM images of propolis species, with expert verification confirming its reliability. **Novelty:** Image classification of stingless bee propolis using MobileNet showed promising performance despite small dataset. With an F1 score of 0.86, the model demonstrated balanced precision and recall, minimizing both false positives and false negatives. For future study, the AI prototype has potential for classification of species using images of raw propolis captured under standardized settings. **Benefits:** Overall, this innovation offers convenient in quality control for propolis manufacturing, sustainable selection of resources and application as nutraceuticals in systemic and oral health.

Key words: Artificial Intelligence, MobileNet, Nutraceutical, Propolis, SEM

ID 21183 PerioCare: A Patient-Centred Post-Surgical Care Guide for Periodontal Patients

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Abstract

Background: Post-operative instructions are an important component of periodontal surgical care because they guide patients in managing bleeding, pain, swelling, oral hygiene, diet, medication use, and follow-up after treatment. **Problem Statement:** However, many patients may forget or misunderstand verbal instructions given immediately after surgery, especially when they are anxious, uncomfortable, or still affected by local anaesthesia. This may reduce compliance, delay recognition of warning signs, increase unnecessary concern, and affect the overall recovery experience. PerioCare was developed as a patient-centered post-operative periodontal surgery instruction kit to provide clear, accessible, and practical guidance during the early healing period. **Objective:** The objective of this innovation is to improve patient understanding, compliance, confidence, and self-monitoring after periodontal surgery through a structured combination of printed and digital educational tools. **Methods:** The kit consists of a simple instruction card, QR-linked short video guides, a seven-day recovery checklist, and a mini post-operative care pack containing essential items such as sterile gauze, a soft toothbrush, mouthwash, and ice pack. **Novelty:** The novelty of PerioCare lies in integrating conventional written instructions with digital video support and a daily symptom-monitoring checklist in one low-cost, clinic-friendly package. The QR videos allow patients to revisit key instructions at home, including how to use an ice pack, how to rinse correctly, what food to avoid, and when to contact the clinic. The recovery checklist encourages patients to monitor pain, bleeding, swelling, medication intake, and mouthwash use during the first week after surgery. **Benefits:** This innovation benefits patients by making post-operative instructions easier to understand, remember, and follow. It also benefits clinicians by standardizing patient education, reducing repeated explanations, and supporting early identification of possible complications. PerioCare is practical, affordable, and adaptable for university, government, and private dental clinics, with potential expansion into clinical audit, patient satisfaction assessment, and future digital oral health education.

Key words: Digital health; Patient education; Periodontal surgery; Post-operative care; Patient compliance.

ID 21184 Digital Dental Implant Passport - MyImplantID

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Abstract

Background: Dental implants are widely considered the contemporary gold standard for replacing missing dentition, offering a durable, long-term restorative solution. Given that implant-supported rehabilitation is expected to function over many years, continuous access to accurate, implant-related information is essential for ongoing monitoring, maintenance, repair, and future prosthetic management. **Problem Statement:** Essential technical specifications—including implant brand, dimensions, connection design, and component details—are often stored within fragmented, clinic-based databases. When patients relocate or change dental providers, subsequent clinicians frequently resort to empirically identifying implant systems, typically through radiographic interpretation. This limited approach results in diagnostic uncertainty, the selection of incompatible components, procedural inefficiency, and avoidable clinical risk. **Objective:** To design, develop, and pilot MyImplantID, a Digital Dental Implant Passport. This passport is a secure, standardized, and patient-centred digital record intended to consolidate all essential dental implant information. **Novelty:** The novelty of MyImplantID is the paradigm shift from conventional clinic-owned documentation to a portable, patient-held digital record that enables lifelong accessibility of implant data. It is envisioned as a brand-agnostic and universally accessible digital blueprint, allowing implant information to be traceable and transferable across clinicians, regions, and healthcare systems. **Benefits:** For patients, MyImplantID enhances confidence, autonomy, and continuity of care. For clinicians, it reduces diagnostic ambiguity, supports accurate component selection, and enhances patient safety and clinical efficiency. For the healthcare system, the initiative addresses a critical gap in local aftercare infrastructure and strengthens Malaysia's dental tourism sector by aligning post-surgical management with international standards for traceability and patient-centred digital health.

Key words: Continuity of Patient Care, Dental Implants, Medical Informatics, Patient Safety, Personal Health Records

ID 21186 Calm-in-3: Transforming Dental Cubicles into Sensory-Friendly Spaces for Children

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Abstract

Background: Dental anxiety and behavioural distress are common challenges in paediatric dentistry, often exacerbated by sensory stimuli within the clinical environment such as bright lighting, loud noises, strong smells, and unexpected touch. These factors may overwhelm children and negatively impact their ability to cooperate during dental treatment. **Problem Statement**: Undergraduate dental students are often trained to manage behaviour reactively, with limited emphasis on modifying the clinical environment to reduce sensory overload. This gap may contribute to increased anxiety, behavioural difficulties, and compromised delivery of care. **Objective:** This project aims to develop a portable, low-cost sensory adaptation toolkit that enables students and clinicians to transform a conventional dental cubicle into a sensory-friendly environment within three minutes as part of behaviour management. **Novelty**: The toolkit comprises targeted sensory modulation and communication aids designed to address key environmental triggers in paediatric dental settings. It includes visual adaptations such as sunglasses and light diffusers to minimise glare and visual overstimulation; auditory supports such as noise-cancelling headphones and anticipatory cue cards to enhance predictability and reduce distress from dental sounds; and tactile tools such as weighted lap pads and fidget items to promote calming and self-regulation. In addition, visual communication aids including social stories, First–Then boards, and stop cards support understanding, improve predictability, and provide children with a sense of control during treatment. **Benefits:** This approach promotes a more inclusive, child-centred model of care by equipping students and clinicians with practical strategies to manage sensory distress. It has the potential to improve patient cooperation, reduce anxiety, enhance clinical experiences, and increase access to dental care for children.

Key words: Paediatric dentistry, behaviour management, sensory-friendly environment, dental anxiety, undergraduate education

ID 21188 UlcerTrack: A Smart Digital Diary for Recurrent Oral Ulcer

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Abstract

Background/problem Statement: Oral ulcers are common in dental settings, with recurrent aphthous stomatitis being the most frequent type. They cause pain, difficulty eating and speaking, and reduce quality of life. While many episodes heal on their own, recurrent or persistent ulcers require attention to identify triggers, track healing, and recognise warning signs. In daily practice, most individuals manage ulcers independently without systematically recording frequency, duration, severity, location, healing progress, or triggers. Consequently, clinical history relies on retrospective recall, introducing bias and distorting true ulcer patterns. This gap can delay timely dental visits and make follow-ups less informative. **Objective:** This study devised an UlcerTrack app, a bilingual (English–Malay) mobile responsive application featuring a structured, prospective digital ulcer diary combined with a pre-diagnostic screening tool. **Methods:** The screening guides users through a four-step questionnaire covering ulcer pattern, current episode details, possible triggers, and warning signs, then stratifies them into three risk categories: green (self-monitor), amber (routine dental consultation), and red (prompt professional assessment). The diary allows real-time logging of ulcer number, duration, pain, location, triggers, and photographs, displayed as a simple trend summary. **Novelty/Benefits:** UlcerTrack systematically documents recurrent oral ulcers, capturing frequency, duration, severity, location, and potential triggers, thereby supporting self-management and improving information quality during consultations. The app also provides structured education on causes, precipitating factors, clinical features, and management principles to enhance user awareness. Anchored by the tagline "Track it, know it, act early," UlcerTrack aims to enhance awareness, promote timely professional consultation, and support better self-management of recurrent oral ulcers. It may also assist dentists and oral medicine specialists by providing prospectively recorded patient-reported records that strengthen clinical review, follow-up, and continuity of care.

Key words: digital health, oral ulcers, ulcer diary, UlcerTrack

ID 21189 DoSE: Drug Oral Side Effects Smart Explorer

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Abstract

Background: Drugs are widely prescribed in both medical and dental settings; however, knowledge and awareness of their potential oral side effects remain limited among patients and even healthcare providers. Various oral manifestations, including xerostomia, gingival overgrowth, ulceration, taste disturbances, and opportunistic infections, may arise as adverse drug reactions. These conditions can significantly impact patients' quality of life, complicate primary treatment, and adversely affect overall health outcomes. **Problem Statement:** Despite their clinical significance, there remains a lack of accessible tools that offer comprehensive and user-friendly information on medication-related oral side effects. **Objective:** This project aims to develop a mobile application, DoSE, designed to provide clear, structured, and clinically relevant information on oral adverse effects associated with commonly prescribed medications, supplemented with clinical images to aid recognition and support clinical interpretation. The application incorporates several key features, including a searchable drug database, a symptom-based navigation system, a medication checker that links specific drugs to potential oral manifestations, and a red-flag alert module to highlight serious conditions requiring urgent professional attention. **Novelty:** The novelty of this application lies in its focus on oral side effects of medications, which are often overlooked in general drug information sources. **Benefits:** By focusing on these manifestations, the application provides targeted, clinically relevant insights that support earlier recognition, improved patient awareness, and clinical decision-making among dental and medical practitioners. Additionally, it provides information on potential additive and synergistic drug interactions that may exacerbate oral side effects. By integrating all these significant elements, the DoSE application serves as both an educational and clinical support tool. Ultimately, it may contribute to safer medication use, improved interdisciplinary communication, and better oral and systemic health outcomes across the general population.

Key words: DoSE, Oral adverse drug reactions, Medication-related oral side effects, smart application

ID 21190 OmniRetra: A Multifunctional Adjustable Cheek Retractor with Integrated Suction, Illumination, and Tongue Stabilization

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Abstract

Background/Problem Statement: Efficient intraoral access, visibility, and moisture control are essential for successful dental procedures; however, these are often compromised by the simultaneous use of multiple instruments such as cheek retractors, saliva ejectors, external light sources, and tongue control aids. This challenge is particularly evident in paediatric patients and complex operative procedures where limited working space and reduced patient cooperation may hinder clinical efficiency. **Objective:** This project introduces OmniRetra, a multifunctional adjustable cheek retractor designed to integrate these essential functions into a single ergonomic device. The system incorporates an adjustable retractor suitable for both adult and paediatric patients, thereby improving versatility across various clinical settings. A built-in suction channel regulated through an intravenous (IV) clamp mechanism enables precise control of suction pressure according to procedural requirements. In addition, a detachable clip-on light source provides focused intraoral illumination, reducing dependence on overhead lighting and improving visibility in confined operative fields. The device is further enhanced with a silicone tongue guard positioned at the floor of the mouth to stabilize tongue movement and improve accessibility during treatment. The tongue guard also contains slots along the lingual sulcus for cotton roll placement, thereby enhancing moisture control and isolation. **Novelty:** The novelty of OmniRetra lies in the integration of retraction, suction regulation, illumination, and tongue stabilization into a single multifunctional system, minimizing instrument exchange and chairside complexity. **Benefits:** This innovation is expected to improve operator ergonomics, reduce procedural time, and enhance patient comfort and safety, offering a practical and scalable solution for use in general, paediatric, and restorative dentistry.

Key words: dental innovation, illumination, moisture control, multifunctional cheek retractor, suction system

ID 21191 Illuminate to Navigate: Endodontic Micro illuminator

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Abstract

Background: Successful endodontic treatment requires accurate canal identification, chemo-mechanical debridement, and obturation of the root canal system. However, this process can be challenging in teeth with complex anatomy, such as premolars, which often present with canal variations and curvatures. Although the dental operating microscope (DOM) has improved magnification and illumination during endodontic procedures, its light penetration into the deeper regions of the root canal remains limited. Consequently, clinicians often rely on tactile sensation and experience to locate canals, which may increase the risk of missed canals and undetected microcracks. **Problem Statement:** Limited illumination within the deeper portions of the canal system may hinder the clinician's ability to identify accessory canals, calcified canals, and structural defects such as microcracks. In many cases, clinicians rely on tactile sensation and clinical experience to locate canals and assess the internal anatomy. This subjective approach increases the risk of missed canals, incomplete cleaning, and undetected cracks, which may compromise treatment outcomes. **Objective:** This project aims to design and develop an endodontic micro-illuminator, a device capable of delivering focused illumination directly within the root canal system to enhance intra-canal visibility during endodontic procedures. **Novelty:** The proposed micro-illuminator introduces direct intra-canal illumination, enabling light to penetrate deeper into the root canal system where conventional external lighting is insufficient. This approach provides targeted illumination within the root canal spaces, allowing clinicians to better visualize internal structures in real time. **Benefits:** The endodontic micro-illuminator is expected to enhance clinical precision and efficiency by improving visibility within the canal system. It may help clinicians locate hidden canals, detect microcracks earlier, and perform more thorough cleaning and shaping procedures. It also enhances patient education by allowing clearer documentation and explanation of canal anatomy and treatment, leading to better understanding and acceptance. Ultimately, this device has the potential to improve treatment outcomes, reduce procedural errors, and support better learning and clinical training in endodontics.

Key words: Endodontics, illumination, root canal treatment, visualization.

ID 21193 DentaSenseTM: A Smart Multi-Sensory Denture Hygiene System for Geriatric Care

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Abstract

Effective denture hygiene poses significant challenges for older adults and their carers, primarily due to declines in vision, hearing, manual dexterity, and cognitive function. Poor denture care is linked to problems such as biofilm accumulation, denture stomatitis, and diminished quality of life. The DentaSenseTM Smart Hygiene Kit addresses these issues by providing an innovative, user-centred denture care system that improves compliance and hygiene. The kit features a specialised multifunctional smart denture case, complemented with a denture brush, an educational infographic, and chemical cleanser table case. The smart denture case utilises ultrasonic cleaning at approximately 40 kHz to efficiently remove biofilm, while ultraviolet (UV-C) sterilisation reduces microbial presence. Its design allows for a seamless transition from cleaning to soaking, minimising handling and contamination risks. To assist users with sensory challenges, especially older adults, the kit includes customizable alerts using visual (LED lights), auditory (alarms), and tactile (vibration) signals. These reminders guide users to remove dentures before sleep, clean and sterilise them, and soak them overnight. A significant advancement is the integration of the DentaSenseTM mobile application, enabling real-time monitoring and remote control of the device. This app allows users to track battery levels, set hygiene reminders, schedule cleaning cycles, and activate the device, thereby enabling carers to effectively supervise denture care. This connectivity fosters adherence to oral health practices, aligning with the growing trend of digital health solutions. By merging mechanical cleaning, sterilisation, behavioural support, and digital monitoring, DentaSenseTM effectively addresses critical gaps in conventional denture hygiene. This system not only aims to enhance oral health outcomes and reduce carer burden but also supports ageing populations in maintaining independence and dignity. Overall, the DentaSenseTM kit presents a novel and accessible solution for improving geriatric prosthodontic care.

Keywords: Assisted Technology, Denture hygiene, Geriatric dentistry, Mobile health (mHealth), Oral biofilm control, Ultrasonic cleaning

ID 21194 Beyond the Chair: A Virtual Reality Journey into the Pathogenesis of Odontogenic Infective Endocarditis

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Abstract

Background: Infective endocarditis (IE) represents a formidable and escalating public health issue. Globally, incidence rates have reached 13.80 cases per 100,000 population, bearing an overall mortality rate of approximately 25%. In Malaysia, the clinical burden is particularly alarming; tertiary hospital admission rates for IE more than doubled between 2012 and 2017, accompanied by a high in-hospital mortality rate of 35.7%. Crucially, nearly 36% of these local cases are caused by Streptococcus species, underscoring the lethal potential of the often-underestimated "Oral-Heart" pathway triggered by odontogenic bacteraemia. **Problem Statement:** Despite these stark clinical facts, a significant barrier to patient comprehension remains. Traditional, static two-dimensional (2D) educational methods are mostly ineffective at illustrating the microscopic severity of dental infections, resulting in poor treatment compliance. Without clear visual evidence, patients have difficulty understanding the direct pathway from common oral diseases to severe cardiovascular complications. This lack of dynamic visualisation impedes the clinician's ability to communicate immediate risk, eventually leading to missed opportunities for early preventive treatments. **Objective:** To bridge this critical gap in health literacy, this table clinic introduces an immersive Virtual Reality (VR) framework designed to revolutionise patient education. **Novelty:** "Beyond the Chair" transitions individuals from passive observation to a dynamic, spatial journey inside the human body. Through dynamic visualisation of odontogenic IE pathogenesis, patients can directly observe the trajectory of cariogenic and periodontal pathogens as they enter the vascular system, navigate the bloodstream, and colonise endocardial structures to induce systemic disease. By demystifying complex pathophysiology through a high-impact visual narrative, this VR innovation transforms a standard dental consultation into a powerful, preventative experience. **Benefits to Society:** Ultimately, it enables patients to understand the vital connection between oral hygiene and systemic health, thereby fostering proactive dental care and improving long-term health outcomes.

Keywords: Virtual reality, odontogenic infective endocarditis, patient education, oral-systemic link, dental care

ID 21195 i-Read (Interactive Reading): Integrating Generative AI and Multimedia into Next-Generation Digital Reading

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Abstract

Background: The digital revolution has transformed the way information is accessed, shifting from printed materials to digital documents such as Portable Document Format (PDF) files. However, most digital documents still replicate the static nature of traditional paper-based content despite this transition. As learners increasingly prefer short videos and immediate, interactive access to information, this creates a significant gap between traditional documents and the cognitive requirements of today's digitally native users for efficient knowledge transfer. **Problem Statement:** Current digital documents are limited in addressing various learning styles such as visual, auditory, and kinesthetic learning preferences, which leads to reduced attention spans and inadequate information retention. Additionally, the lack of real-time feedback forces users to seek assistance from external sources, thus reducing the overall effectiveness of the learning process. **Objective:** The primary goal of this innovation is to create an Interactive Multimedia Monograph (IMM), a next-generation digital document that integrates text with multimedia elements such as audio, video, graphics, animation, and an AI assistant chatbot. This initiative seeks to convert the passive reading experience into an engaging and immersive environment, thereby delivering a comprehensive platform that promotes active learning and focused work without relying on external applications. **Novelty:** The core innovation of iRead is its Unified Contextual Intelligence (UCI). Unlike conventional e-books, this framework includes a Generative AI "Concierge" directly within the document. This creates a "closed-loop" knowledge base in which the AI has contextual awareness of the user's active page, providing immediate support and clarification. This intelligence is further enhanced with synchronized narration, on-page video, and interactive haptic zooming. **Benefits:** This innovation offers transformative impact across multiple sectors. In education, it supports digitalisation by offering varied learning pathways and methods for different students. In both corporate and public sectors, it transforms training and communication, ensuring higher compliance and engagement. Ultimately, the i-Read framework promotes a supportive environment for knowledge acquisition tailored to the demands of the modern digital era.

Keywords: Interactive E-Book, AI-Powered Book, Digital Literacy Tools, Interactive Multimedia Monograph

ID 21197 "Catching a Silent Killer": Usage of Augmented Reality in Periodontics

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Abstract

Background/Problem Statement: Periodontal disease is a major concern, often referred to as a "silent killer" disease. It typically originates from poor oral hygiene, leading to gum inflammation, which is frequently ignored by patients because the disease progresses subgingivally and remains invisible until advanced stages, when irreversible damage may already have occurred. Patients tend to overlook early warning signs as they cannot visualise disease progression, making it crucial for dentists to enhance awareness regarding the stages of periodontal disease, namely gingivitis, periodontitis, and advanced periodontitis. **Objective:** This research focuses on the use of Augmented Reality (AR), which enables patients to visualise the layered structures of oral tissues at each stage of periodontal disease. **Novelty:** With a simple QR code scan, patients can access an interactive 3D model that clearly demonstrates disease progression in a visually engaging and easily understandable format. **Benefits:** In conclusion, this innovation aims to improve efficiency in patient education by providing a simple, interactive system that enhances understanding, supports early awareness, and promotes better oral health outcomes.

Key words: Education, Dental, Periodontology, Periodontitis, Augmented Reality

ID 21198 OcaR: A Smart Oral Cancer Risk Assessment Application "Early Detection, Timely Intervention"

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Abstract

Background/Problem Statement: Oral cancer is a major public health concern due to its increasing prevalence and poor prognosis when diagnosed at advanced stages. Delayed detection is often associated with limited public awareness regarding oral cancer risk factors and early warning signs. Therefore, accessible preventive strategies are essential to promote early identification and timely professional intervention. **Objective:** OcaR: A Smart Oral Cancer Risk Assessment Application (Early Detection, Timely Intervention) is a digital health application developed to support preliminary oral cancer risk screening and increase community awareness. **Methods:** The application utilizes a structured self-assessment system based on established oral cancer risk factors, including age, tobacco consumption, alcohol intake, and other relevant behavioural and clinical indicators. Each parameter is assigned a weighted score according to its relative association with oral cancer risk. Following completion of the assessment, the application automatically calculates the cumulative score and stratifies users into low-, moderate-, or high-risk categories. The application is not intended to establish a definitive diagnosis; instead, it functions as an educational and preventive tool aimed at encouraging users to seek professional dental evaluation regardless of their risk level. **Novelty:** By integrating risk stratification with digital accessibility, OcaR promotes public engagement in oral cancer awareness and supports the importance of early detection in reducing disease burden. **Benefits:** This innovation demonstrates the potential application of digital technology in preventive dentistry and community-based oral healthcare initiatives.

Key words: oral cancer, OcaR, risk assessment, tobacco, alcohol

ID 21199

F.A.C.E.-I.D (Facio-Cervical Evaluation – Impairment & Disfigurement): A simple Novel Index for Head and Neck Burns

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Abstract

Background/Problem Statement: Head and neck burns are a major global health issue because of their long-term morbidity among survivors. Evaluation of facial and cervical movements, along with disfigurement, is necessary for the assessment of motor deficits, planning reconstructive surgery, and assessing improvement after surgery. Currently, the evaluation is mostly subjective. The objective assessment methods currently available are either too complicated for general use or require expensive instrumentation. As the Functional and Disfigurement Index should ideally be utilized by surgeons, physicians, patients, and advocates for clinical and medico-legal purposes, it needs to be simple yet objective. **Objective/Novelty:** As a solution to this problem, we have developed a novel, reliable, and easy-to-use index for disfigurement and functional deficit assessment in head and neck burn victims. Facial disfigurement and dysfunction in burn victims should also be measured on a continuum to effectively assess intermediate levels and differentiate subtle differences, which is especially important for evaluating postoperative results and long-term follow-up. **Benefits:** Hence, it promises to be a simple, reproducible, cost-effective, and objective method for assessing facial and cervical function and disfigurement, establishing proof of concept and providing a basis for further research.

Key words: Facio-Cervical, Head and Neck Burns, Dysfunction Index

ID 21200 AcademicAlerts: An Innovative Web Portal for Verified Academic Events

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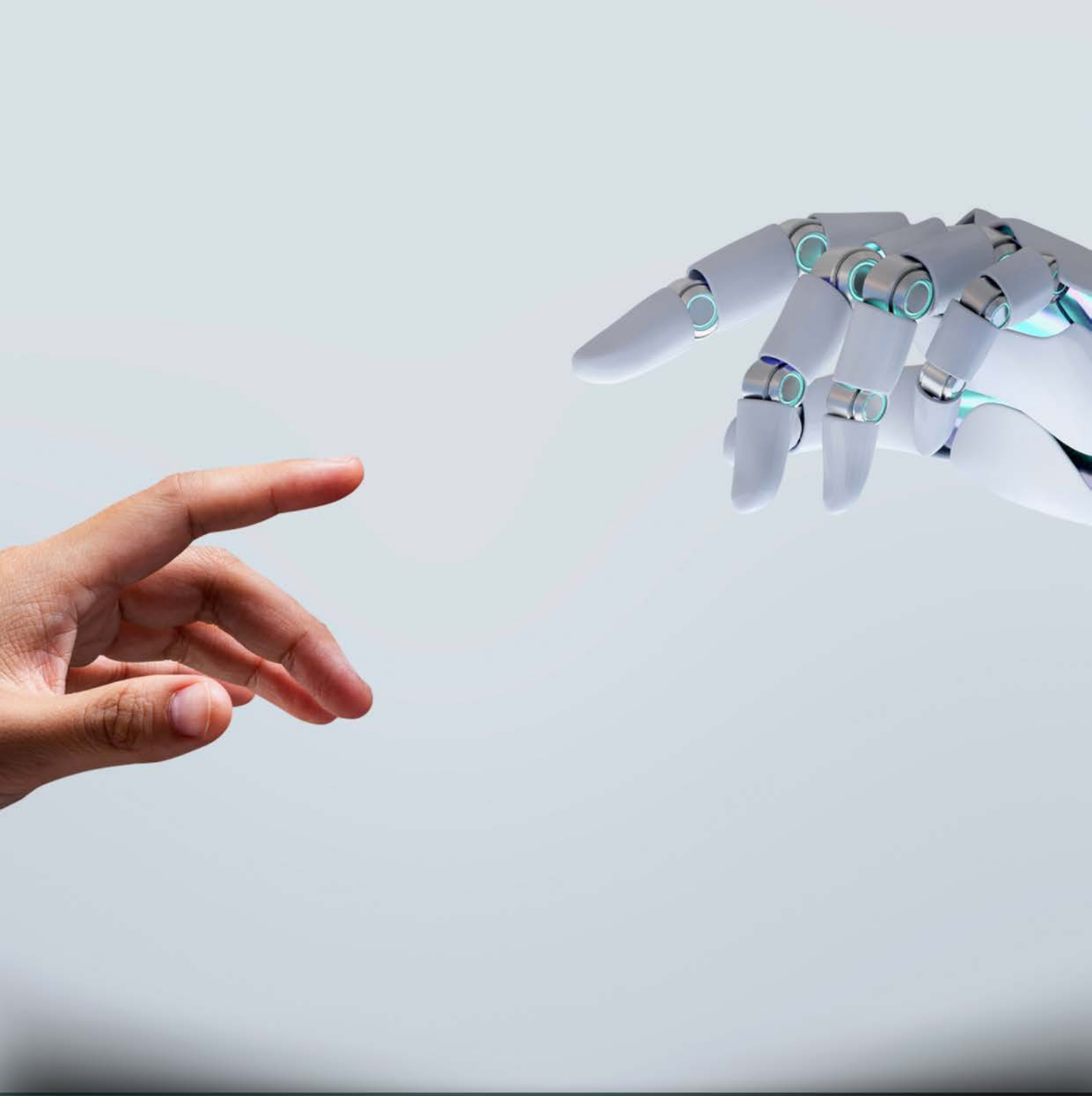
Abstract

Background/Problem Statement: In the current academic environment, research metrics, either in the form of publications, academic presentations, research awards, or intellectual property rights, are tied to institutional rankings or individual career advancement. This peculiar scenario has led to individuals falling prey to dubious solicitation tactics employed by predatory publishing houses and organizers of academic events. Over the years, there has been a mushrooming of predatory conference organizers and publishing houses. These groups often reach out in very pushy and relentless ways, mainly targeting young researchers eager to build their academic reputation. **Objective/Novelty:** As a solution to this menace, we developed a web portal, academicalerts.org (Acadnetica Solutions Private Limited), managed by a group of academics, ensuring that only genuine peer-reviewed academic events across disciplines (Health Sciences, Management, Technology, and Humanities) occurring worldwide are listed on the web portal. **Benefits**: This innovative solution currently has over 16 thousand active users worldwide.

Key words: Academia, Predatory Events, Innovative Solutions



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