E-Bulletin

April 2024 Edition

Building Stronger Nation: The Role of Industrial INNOVATION

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PREFACE

From The Editorial Team

First and foremost, we would like to praise to Allah the Almighty, the most Gracious and most Merciful for His blessing because at the end we had completed the first edition of E-Bulletin for 2024.

We would also like to express our deepest gratitude to beloved Chairman, Prof. Capt Dr Ab Manan bin Mansor, Advisor, Madam Salina binti Ahmad, Chief Executive Officer, Assoc Prof. Dr. Faiz Aizat bin Ab Manan, Provost, Dr Muhammad Nurulfaqih bin Mohd Sajali, Dean of Faculty of Science and Technology, Ts. Muhammad Zulhiqmi bin Mohd Jamil and Dean of Faculty of Hospitality and Management, Madam Norulbaiti binti Mohd Nor for the endless support and encouragement to make this publication a success. E-bulletin is the platform for UniCAM staff to share their piece of mind on issues related to aviation, health, leisure, aerospace and many more. This edition is only possible due to hard work and contribution of all UniCAM staff. Therefore, we would like to thank all UniCAM staff for their cooperation.

We really hope that you take the time to read what this E-bulletin has to offer and feel free to provide feedback and comments for us to improve in the future.

Thank you for all the love and support!

Your sincerely,
Editorial Team

Amirul Asraf bin Abdul Rahman
Siti Aisyah binti Ajemi
Umar Abdillah bin Anwar

Blended Experiential Learning for College Students Innovation Mindset: UniCAM Experience

By Prof Capt Dr. Ab Manan Mansor

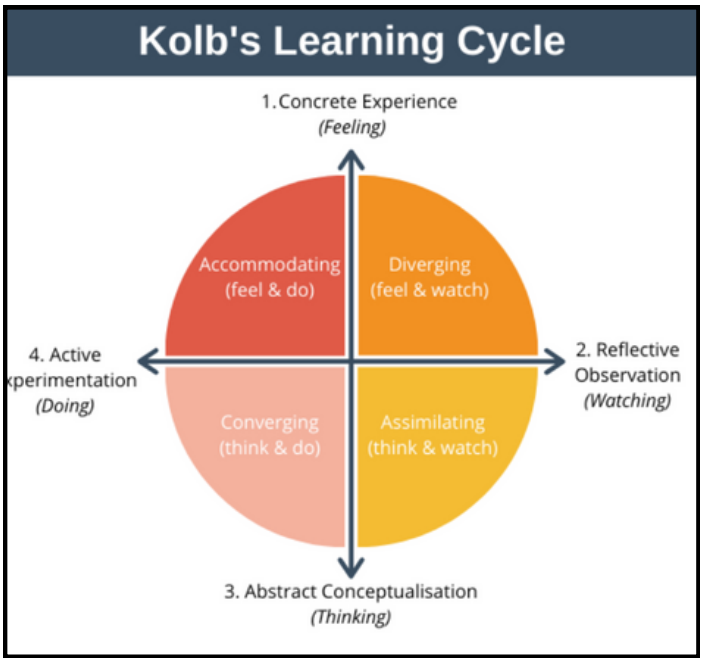
Chairman of UniCAM

For college students to succeed in this fast changing world, they must cultivate an innovation mindset, which gives them the skills and competencies they currently need. The capacity for innovative thought, flexibility in the face of change, and a solution-focused attitude to problems are all considered aspects of an innovation mindset (Chell and Arthayde, 2017). Having an innovative mentality has grown more crucial for success in a world where technology and continual change are the norm.

Educational institutions can use a variety of teaching strategies to help college students develop an innovative mindset.

Firstly, regular public speaking training becomes the core learning process. Being able to speak publicly enables students to develop confidence and innovation thinking. (Yulianti and Sulistyawati, 1921). This improves the students presentation and communication skills tremendously, leading to their collaboration, critical thinking and creativity skills especially when they need to answer questions from the floor.

Kolb's (2014) method of experiential learning (EL) is one that has been shown to work. Kolb focused on the four components of EL, which are Concrete Experience (CE), Reflective Observation (RO), Abstract Conceptualization (AC), Active Experimentation (AE) , of which, RO and AC represent the learning of knowledgea nd memory, and AE and CE represent the skill development learning. See model below.



Problem-based learning, in which students are asked to solve creative problems by using real-world situations are inspirational and an AC mode. Regularly, case study exam questions are given to enable them to develop their problem solving skills.

With this mode, students are encouraged to interact, think critically, and come up with creative solutions to problems. Establishing an environment where students are encouraged to take risks and experiment, learn from their mistakes, and become resilient is another powerful learning outcomes.

Through internships, students can put their theoretical knowledge to use in a practical environment. A review of the research by Rothman and Sisman (2016) states that internships are seen as a useful type of experiential learning that fosters students' ability to think creatively. Students are exposed to new methods of thinking and problem-solving when they work with professionals in their chosen industry, which encourages them to acquire the innovation mindset. UniCAM students on internship are required to write back monthly reports and develop a video of their supervisors' views on how the operations are run successfully

In the project-based Learning, UniCAM's students work on real-world issues or projects, frequently in pairs with businesses or neighborhood associations. Kolb insists that project-based learning has been shown to foster innovative thinking by giving students the chance to participate in experiential, inquiry-based learning. Students learn how to think creatively and come up with fresh ideas by working on assignments that call for creative problem-solving. Students are made to visit industry and meet the industry captains solicits for answers to all their theoretical knowledge learnt in classes earlier.

APPLICATION IN UNICAM

UniCAM has adopted the blended experiential learning together with the current MQAs outcome-based learning curriculum for its students for the last 10 years. The students were exposed, among others, regular public speaking assessment, organizing CSR activities, case study presentations and project paper viva. The graduate's outcomes were measured by surveying the all of its graduates in 2022, and it was found that UniCAM graduates had attained 95% employ ability and graduates having adopted the traits of leadership, energy, risk propensity, self-efficacy and creativity as suggested by Schell & Atheair (2009).

In conclusion, fostering an innovation mindset is important for college students to thrive in an ever-changing world. By employing proven teaching methodologies such as project-based learning and fostering a culture of research and experimentation, educational institutions can nurture students' creativity and adaptability traits. Assessing the attainment of an innovation mindset can be achieved through alternative assessment methods that capture students' ability to think innovatively during their experiential learning presentations. With an innovation mindset, college graduates will be better prepared to meet the demands of future global careers while simultaneously contributing to national well-being.

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The Bright Future of Solar Energy: Innovations and Increasing Capacities

By Assoc Prof Dr. Faiz Aizat Ab Manan

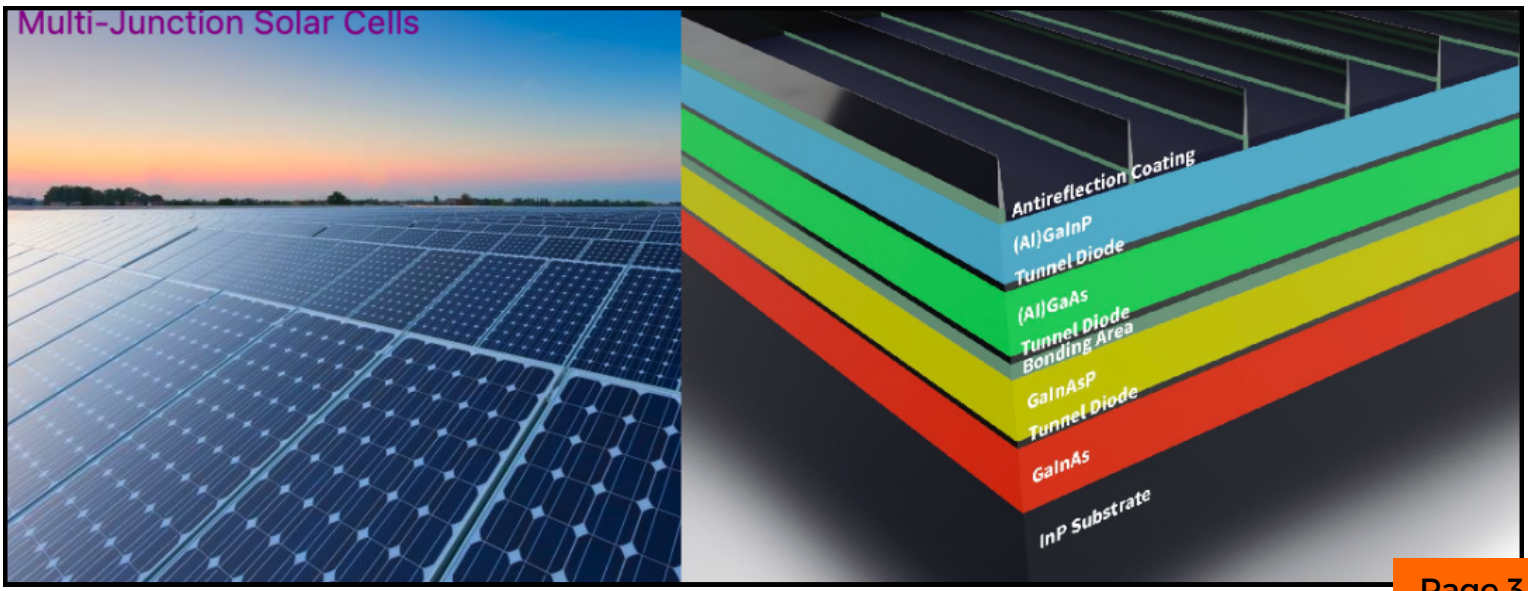
Chief Executive of UniCAM

Introducing the concept of using solar energy to generate clean, sustainable power is a major step towards creating a better future. The advancement of solar energy has made it possible to exploit the sun's abundant resources in a more cost-effective and efficient manner. This renewable energy source offers a long-term replacement for conventional fossil fuel-based power plants, which has the potential to drastically alter the way we produce electricity. This article will look at the exciting developments in solar energy technology and how they can lead to the development of sustainable energy sources that will brighten our future.

At its first launched in the 1950s, the solar system was intended to harvest solar energy and convert it into electrical power. The design and manufacturing of solar panels has advanced technologically in recent decades, making solar energy harvesting much more dependable and efficient. Dambhare et al. (2021) claim that these developments have not only decreased the overall cost of installation and maintenance but have also made solar electricity more widely available to a wider range of customers. Now that solar panels are more affordable and efficient, they can convert a higher percentage of sunshine into electrical power.

One of the most significant advancements in solar energy is the use of high-efficiency solar cells, which have significantly enhanced the conversion of solar energy into electricity. These cells have the capacity to absorb more light than before, and they are also better able to convert that light into electricity (Udayakumar and colleagues, 2021). Improvements in solar energy storage research and development have led to more dependable and efficient battery systems, which allow excess solar energy to be stored for use even when the sun isn't shining.

This revolution in solar energy technologies has led to a paradigm shift in the global energy sector. The potential of solar energy to simultaneously ameliorate the effects of climate change and provide a significant portion of the world's energy demands cannot be overstated (Wang and colleagues, 2023) It is evident that future developments in solar energy will be essential to creating a clean and sustainable energy environment. Thanks to advancements in solar panel technology and efficient energy storage technologies, renewable energy sources will power the planet in the future.



Similar to aircraft, solar cell innovations typically aim to be more affordable, lightweight, adaptable, and a greater return on investment. The most notable advancement in solar energy innovation to date is the consistent rise in efficiency. Modern solar panels can convert a higher percentage of sunshine into power than ones from past times. With the advent of technologies like perovskite and tandem solar cells, which have broken efficiency records, solar energy is now more competitive with traditional fossil fuels. Because there are so many different types of solar panels for commercial use, the average capacity of solar panels for home and business use often falls between 250 and 400 watts per panel. These are typical sizes, and depending on the specific brand and type of solar panel, the actual wattage may vary (Kazmerski, 2006).

The prime challenge of the solar panel researchers is to multiply the solar panel capacity where it is known that as it stands, 1,000 watts can be generated from a single solar panel designed in China. Malaysia, with its abundant sunlight and commitment to sustainable development, ought to tap into this research and design more efficient solar panel with higher capacity. As the risk and cost in R&D testing for the solar panel is much less comparatively to the traditional fossil fuels, Malaysia should emerge as a significant player in the solar industry, maximizing the full growth in solar installations and paving the way for a cleaner, greener energy future at the minimum price. The government initiatives can be seen through various plan such as The Green Technology Master Plan (GTMP), which was introduced by Malaysia in 2009 as a means of advancing sustainable development. The plan outlines precise goals for energy efficiency, the capacity of renewable energy sources, and the adoption of green technologies. In order to meet these goals, solar energy is essential, and programmes like the Large Scale Solar (LSS) programme help to expand the number of utility-scale solar projects. Still, according to MIDA in August 2023, fewer than 30,000 homes in Malaysia installed solar panels from a solid 4 million landed homes in Malaysia. Ultimately, less than 0.75% of household are utilizing the solar technology when the sun is shining all year long in Malaysia. The main issue of this devastated statistic is not due to lack of knowledge on solar technology, but the price of the solar panel installation which question the affordability and ROI.

Thus, it has become our main challenge to innovate the advance solar panel - like bifacial panels, which receive light from both sides (raised energy yield even more), light composite material with strong tensile strength – like the material used in the recent Airbus A350, enhancing the electric appliances associating with the solar panels – upgrade wire conductor, energy storage solution, etc; simple, straight -forward and DIY installation procedures and most significantly, all these innovation will lead to the main outcome, creating a much affordable solar practices among Malaysian. Indeed with these execution, the rate of 0.75% solar-powered house owners in Malaysia shall be increasing rapidly, in line with the Green Technology Master Plan (GTMP) initiated by the Malaysian government as part of its commitment to promoting sustainable development. Plenty of research grants and NGOs need to be established especially among the local universities in Malaysia, to innovate the large scale commercial usage of solar panel in supporting the Net Energy Metering (NEM) scheme, which to encourage and allows consumers to install solar panels on their rooftops and feed excess energy back into the grid, promoting distributed generation. This approach empowers individuals and communities to actively participate in the country's transition to clean energy (Miah et al., 2020).

APPLICATION IN UNICAM

University College of Aviation Malaysia (UniCAM) on the other hand, is looking seriously into this a powerful and sustainable solution to meet the growing global energy demand. As the saying, "Walk the Talk", one of UniCAM's strategic planning is to explore knowledge to increase the marketability of graduates, not just in aviation, but also in renewable and green technology industry. UniCAM has already taken a proactive step by testing the effectiveness of this initiative by installing 144 KW of solar panels on the campus building for the past three years and reusing this energy for campus operations and reselling the balance to TNB. With that success, UniCAM was proudly awarded the status of Green Interactive Technical Award by Malaysia Green Technology Corporation, making us the only if not the few private universities in Malaysia to receive such recognition . Now UNICAM managed to obtain a return (ROI) of 30% for the 144kw solar installation. Based on this success and experience, UniCAM is striving to produce graduates with research mindset through our Bachelor Degree in Science, not just innovate the solar panel technology, but to design and manufacture our very own solar panels.

TOWARDS SUSTAINABLE ENERGY

The development of solar panel technology and the rise in solar energy production capacity signal a paradigm shift in the world's energy system. With advancements in technology leading to reduced costs, more efficiency, and greater application possibilities, solar energy is expected to emerge as a major player in supplying our energy requirements.

Solar energy promises to fuel not only a sustainable future for the environment but also a profitable one, bringing in a new era of clean, plentiful solar energy. A university dedicated to adopting sustainable practices and lowering its carbon footprint is demonstrated by UniCAM's commitment to aggressively address solar energy. UniCAM has established itself as a leader in solar energy education, from research to the real practice of installing solar panels on our campus. By utilising its solar resources, Malaysia is not only bringing clean energy to its cities but also aiding in the worldwide shift towards a future that is more robust and sustainable.

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Innovative Heights: Revolutionizing Air Cargo with Composite Pallet Technology

By Norulbaiti Mohd Nor

Dean Faculty of Management & Hospitality

In the dynamic landscape of air cargo transportation, technological advancements continually shape the industry's efficiency and safety standards (Smith, 2023). Among these innovations, composite air cargo pallets stand out as a transformative force, redefining the way goods are transported through a combination of lightweight design, enhanced strength and digital integration.

Composite air cargo pallets represent a significant shift in materials engineering, combining elements such as carbon fiber, fiberglass, and high-strength polymers to create lightweight yet robust structures (Brown & Johnson, 2022). The pallets which are significantly lighter than their traditional counterparts, offering an excellent strength-to-weight ratio that has caught the attention of major players in the aerospace industry (Smith, 2023).

The implementation of composite pallets addresses crucial challenges faced by the air cargo sector. These challenges include the need for increased payload capacity, improved fuel efficiency and enhanced cargo safety during transportation (Smith, 2023). As we look deeper into the details of composite pallet technology, it becomes obvious that these innovations are not just about adapting to change but they are about pioneering a new era in air cargo transportation.

LIGHTWEIGHT STRENGTH: A GAME-CHANGER IN FUEL EFFICIENCY

One of the key advantages of composite air cargo pallets is their lightweight design, which directly contributes to reduced fuel consumption (Brown & Johnson, 2022). Traditional pallets, often made of metals like aluminium and wooden, can be heavy and impact the overall weight of the aircraft. In contrast, the lightweight nature of composite pallets ensures that airlines can achieve fuel savings without compromising on strength and durability (Smith, 2023).

This reduction in fuel consumption is not only economically advantageous for airlines but also aligns with the industry's increasing focus on sustainability. A study by the International Air Transport Association (IATA) suggests that a 1% reduction in fuel consumption can result in a 2-3% reduction in carbon emissions (IATA, 2022). Thus, the implementation of composite pallets becomes a strategic move in achieving both economic and environmental goals.

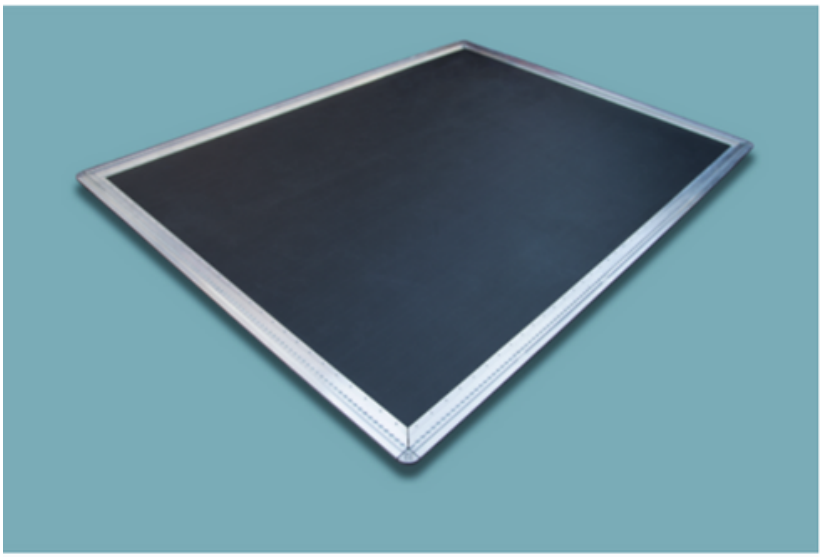

FIGURE 1: The lightest Air Cargo Pallet

Beyond the environmental benefits, the innovative use of composite materials in air cargo pallets leads to a remarkable increase in payload capacity (Smith, 2023). This improvement is particularly significant in an era where global trade demands efficient and cost-effective transportation solutions. Airlines utilizing composite pallets can transport more goods with the same amount of fuel, optimizing operational costs and contributing to a more sustainable industry (Brown & Johnson, 2022).

DURABILITY: A SUSTAINABLE APPROACH TO MAINTENANCE

In addition to their lightweight design and increased payload capacity, composite air cargo pallets offer enhanced durability, reducing the need for frequent replacements and maintenance (Brown & Johnson, 2022). Traditional pallets, especially those made from metals and wooden are vulnerable to corrosion, broken and wear over time. Composite materials, on the other hand, exhibit greater resistance to environmental factors which ensuring a longer lifespan for the pallets.

This longevity not only benefits the airlines economically but also contributes to a more sustainable and eco-friendly aviation sector (Smith, 2023). The reduced frequency of maintenance operations translates to less downtime for aircraft, contributing to increased operational efficiency. As airlines continue to seek ways to streamline their operations, the durability of composite pallets becomes a compelling factor in their widespread implementation.

Other than that, the safety of air cargo is the top priority and composite air cargo pallets excel in maintaining cargo integrity during transit (Smith, 2023). The advanced materials used in their construction provide excellent resistance to temperature variations, humidity, and other environmental factors that can impact the quality and condition of goods. This ensures that high-value or sensitive cargo arrives at its destination in optimal condition, reducing the risk of damage and loss.

Furthermore, the structural integrity of composite pallets contributes to improve safety standards in the air cargo industry. Rigorous testing and certification processes ensure that these pallets meet and exceed industry standards for load-bearing capacity and structural stability (Brown & Johnson, 2022). This commitment to safety is crucial in building trust among cargo carriers, shippers, and regulatory bodies.

DIGITAL INTEGRATION: THE SMART REVOLUTION

In addition to their physical attributes, composite air cargo pallets are also at the forefront of the digital revolution within the industry (Green et al., 2024). Smart technologies, such as Internet of Things (IoT) sensors and tracking systems, can be seamlessly integrated into these pallets, providing real-time monitoring of cargo conditions (Green et al., 2024). This level of transparency enables airlines and logistics companies to proactively address issues such as temperature fluctuations or excessive vibrations, ensuring the safe and secure transportation of sensitive goods.

The integration of digital technologies also enhances supply chain visibility which allowing stakeholders to track the movement of cargo from origin to destination (Green et al., 2024). Real-time data on cargo conditions not only reduces the risk of theft or tampering but also streamlines logistics operations, contributing to overall efficiency and customer satisfaction.

Several major airlines have embraced composite air cargo pallets, recognizing the substantial benefits they bring to their operations. For instance, AirCargo Express, a leading global cargo carrier, reported a 15% reduction in fuel costs after integrating composite pallets into its fleet (AirCargo Express, 2023). This financial saving allowed the airline to invest in other sustainability initiatives, further setting its commitment to environmental responsibility.

Emirates SkyCargo, another industry giant, reported a 20% increase in payload capacity on selected routes after transitioning to composite pallets (Emirates SkyCargo, 2022). This boost in efficiency allowed the airline to optimize its routes and schedules, providing a more competitive and cost-effective service to its customers.

These case studies demonstrate the tangible impact of composite pallet technology on the operational and financial aspects of air cargo carriers. As more airlines witness these success stories, the implementation of composite pallets is expected to gain further momentum, shaping the future of air cargo transportation.

GLOBAL IMPACT: ENVIRONMENTAL SUSTAINABILITY IN AIR CARGO

The implementation of composite air cargo pallets is not just a strategic move for individual airlines but it also contributes to the broader goal of environmental sustainability in the air cargo industry. The International Air Transport Association (IATA) recognizes the role of technological innovations including the use of composite materials, in achieving the industry's commitment to reduce carbon emissions (IATA, 2022).

A study by the Air Transport Action Group (ATAG) estimates that the aviation industry's CO2 emissions could be reduced by up to 15% through the widespread adoption of lightweight materials in aircraft construction (ATAG, 2023). Composite air cargo pallets, with their lightweight design and fuel efficiency benefits, are a significant contributor to this reduction in emissions.

Furthermore, as countries and regions implement stricter environmental regulations, airlines adopting composite pallets position themselves as leaders in sustainability. This not only enhances their corporate social responsibility profiles but also aligns with consumer preferences for eco-friendly business practices (Smith, 2023). As the air cargo industry evolves, environmental sustainability is set to become a defining factor in shaping its future.

Embracing composite pallet technology is not just a matter of staying competitive, it is a commitment to sustainability, efficiency and safety in an industry that is vital to global commerce. As these innovative pallets become more widely adopted, the skies are set to become more environmentally friendly, economically efficient, and technologically advanced than ever before.

In conclusion, composite air cargo pallets have not only revolutionized the way goods are transported but have also become a catalyst for positive change in the air cargo industry. As these innovative technologies continue to mature and gain widespread acceptance, the skies of tomorrow are poised to be safer, more efficient, and more environmentally sustainable than ever before.

IN UNICAM: SOAR TO NEW HEIGHTS WITH UNICAM'S BACHELOR IN AVIATION, SPECIALIZING IN CARGO & LOGISTIC

In a world where globalization and connectivity are dominant, the aviation industry plays a major role in ensuring the seamless movement of goods and people across the globe. For individuals with a passion for aviation and a keen interest in the logistics and air cargo, the Bachelor in Aviation (Cargo & Logistics) program from UniCAM is the perfect path to an exciting and rewarding career.

The curriculum is designed in based on feedback from the industry experts to ensure that students gain practical understandings and skills that are directly applicable to the aviation and logistics sectors. From Air Cargo Operations to Logistics & Warehousing, every subject is carefully crafted to meet the demands of the industry.

UniCAM recognizes the importance of gaining practical experience in the field. The program includes internship opportunities with leading aviation and logistics companies, giving students the chance to apply their skills in a professional environment and build a network within the industry.

Embarking on UniCAM's Bachelor in Aviation (Cargo & Logistics) opens the door to a world of opportunities. Whether aspiring to become a cargo operations manager, air logistics specialist, or supply chain analyst, graduates of this program are equipped with the knowledge, skills, and industry connections necessary for a successful and fulfilling career in the dynamic field of aviation and logistics. Join UniCAM, where the sky is not the limit but the beginning of a promising career in aviation.

For more information, please log on to https://aviation.edu.my/ba/ or call 03-8760 9000.

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The Digital Economy and Innovation: Opportunities in the New Era of Technology within Tourism Industry

By Umi Nazira Rafie

Lecturer Faculty of Management & Hospitality

The digital economy has emerged as a novel economic paradigm leading the trajectory of global economic development and has garnered widespread attention from all countries worldwide. The Digital Economy encompasses a range of economic and business commercial activities employing digital technologies and electronic communication. This economic model commonly involves activities such as e-commerce, digital marketing, financial services conducted through digital platforms, production of digital content, software development, computer games, cloud services, and etc.(Guo et al,. 2023; Li et al,. 2024). The emerging economy has been acknowledged as a pivotal catalyst for economic advancement and progress in some countries, and owing to significant importance of digital technologies, it is experiencing growth and expansion. Similarly, as dynamic transformation of the Digital Economy continues to evolve, it brings significant influence on diverse economic, social, and cultural fields.

The growth of the tourism industry stands as a pivotal factor in economic growth, and the integration of digital technologies within this industry has elevated the tourist experience and reduce the operational expenses. In the era of digitalization, tourism products is no longer refine to the scope of leisure and vacation; it also includes complex functions, such as culture, experience and education.(Kim et al., 2022).China is proactively responding to the digital revolution and harnessing the full potential of the digital economy's advantages. China is ranked among the top emerging digital nations in the East Asia and Pacific region (ESCP Europe Digital Competitiveness Center, 2021). Table 1 shows a comparison of the percentage growth of the tourism industry and economic growth in countries that have utilized digital technologies to promote tourism.

Table 1
Growth of the tourism industry (percentage), Economic growth (percentage) in various countries with digital economic tourism.

Country	Economic growth (%)	Growth of the Tourism Industry (%)
China	6.5	33.0
America	6.4	25.0
Japan	2.8	20.0
Brazil	4.1	22.0
England	4.1	15.0
Germany	3.6	22.0

TABLE 1: Comparison of the percentage growth of the tourism industry and economic growth

As shown, China outperforms other countries by achieving a 6.5% economic growth and a 33% growth in the tourism sector. The United States, on the other hand, ranks in the second position, 6.4% economic growth and a 25% growth in the tourism industry. The presented data signifies that tourism industry in the digital economy holds immense potential for fostering economy growth and employment opportunities.

Emerging technologies are playing an increasingly pivotal role in enhancing the tourist experience, and numerous sectors within the tourism industry are integrating these technologies to enhance the overall travel experience for tourists. Four notable technologies in this context encompass virtual and augmented reality, the Internet of Things (IoT), robotics, artificial intelligence (AI), and electronic payment systems. Virtual and augmented reality afford tourists the opportunity to immerse themselves in tourist destinations through pre-travel images and videos. Augmented reality further facilitates the provision of information about the surrounding spaces and facilities. IoT technologies find application in the effective management and control of facilities within hotels and tourist centers, while robotics and AI are employed for services such as guest reception, room maintenance, and tourist guidance.

Electronic payment systems represent another advantageous technology for tourists, eliminating the need for physical currency and facilitating the seamless utilization of various services. Particularly, virtual and augmented reality have gained significant traction within the tourism industry. Virtual reality allows users to experience a fully immersive 3D environment through specialized glasses, while augmented reality enhances the real-world experience by overlaying virtual information on actual images, accessible through mobile devices.

The incorporation of virtual and augmented reality empowers tourists to explore and gain insights into tourist destinations before their actual travel, enabling informed decision-making about their trips. Conversely, IoT connects disparate objects to the internet and each other, facilitating data collection and exchange. In the tourism industry, IoT can be leveraged to enhance services and the overall experience for tourists. The various technologies used in the tourism industry have unique capabilities that can enhance the tourist experience and improve the performance of tourism systems. AI can help manage complex data and improve the performance of tourism systems, while augmented reality can create interactive experiences and increase the attractiveness of tourist destinations.

With regards to the potential of digital technologies in enhancing the tourist experience, augmented reality can also be utilized in the hotel industry to deliver appealing attractions to consumer. Electronic devices can be employed by customers to engage with augmented reality, allowing them to view hotel rooms and enrich their overall experience within these accommodations. The integration of augmented reality in the tourism sector has the capacity to elevate the tourist experience, enhance the allure of tourist destinations, and strategically optimize available resources and facilities to enhance the efficiency and productivity of tourism systems.

In sum, the incorporation of digital technologies and electronic communications within this industry led to a significant transformation towards online business interactions, faster processing, and digitalization. Moreover, this transformation not only enhanced user experiences but has also facilitated simplified access to services and products. The digital economy is recognized as the main driver of economic growth and development in many advanced countries and continues to develop continuously due to the special importance of digital technologies and their impact on economic and business activities.

The tourism and hospitality industry contributes significantly to a nation's economy and employs a large number of people. The industry has an ongoing commitment to training in both customer service and technical areas. Hence, as the competition nowadays is getting fierce, it is time to nurture and develop students to prime for a career at the heart of one of the most exhilarating and fastest-growing industries, aviation tourism. In the University College of Aviation Malaysia (UniCAM), Diploma in Aviation Tourism Management (DATM) prepares students for leadership roles in the tourism and hospitality industry through diverse practical skills, business-related knowledge, and experiential learning. Not only to integrate the industry immersion with academic projects, but this program offers entrepreneurial competencies and prepares students with a solid foundation for future success. Workplaces for which Tourism and Hospitality competencies are required include travel agencies, airline catering, hotels, resorts, as well as travel and tourism organizations.

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Business Co-creation for Service Innovation in the Airline Perspectives

By Nur Anis binti Kamaruddin

Lecturer Faculty of Management & Hospitality

Global trends have significantly impacted all regions, shaping the landscape for education and training, both currently and in the near future. This article explores key global change drivers, including the supply-side challenges of demographic change, educational attainment, and commitments to inclusive growth, as well as the demand-side challenges of market globalisation, technological innovation, and climate change.

Business co-creation for service innovation in the airline industry involves collaborating with a range of stakeholders, including customers, employees, and partners, to develop and enhance services that align with evolving needs and expectations. There are some strategies and considerations for co-creating service innovations in the airline industry. One way is to involve customers in the production of goods and services. Bettencourt, Lusch, Vargo (2014) described co-creation as the interaction and actions of firms, customers and other stakeholders to collaborate and utilize available resources to achieve an intentional and agreed value-in-context.

Co-creation refers to a collaborative relationship between supplier and customer during the value creation where the customers play an enthusiastic role in the innovation (Chathoth et al., 2013). Despite the fact that businesses give proper consideration to the experiences shared by the customers, they should also integrate these experiences into product or service renovations to better meet and satisfy customer preferences (Vargo & Lusch, 2008; Suntikul & Jachna, 2016; Andotra & Bhat, 2017).

To adapt to the dynamic nature of market situations and evolving customer needs, continuous dialogue and interactions between the organization and its customers are essential for co-creation (Grissemann & Stokburger-Sauer, 2012). It is an experience-centric concept that underscores the cooperation between businesses and customers (Ramaswamy & Gouillart, 2010). Thus, co-creation encompasses three key aspects which includes the customer, the firm and the interaction between the customer and the firm.

Toivonen and Tuominen (2009) suggest that service innovation is a new service or a renewal of an existing service that benefits the organization that develops it. this benefit usually derives from the added value that the renewal provides to the customers. Synder et al. (2016) note that prior studies have used various methods to explain and define service innovation. However, overall definition explains service innovation by describing the innovation's core characteristics for instance (OECD, 2005) defines service innovation as an initiation of a first-hand or considerably upgraded product (good or service) or process, a new marketing routine, or a new organizational method in business practices, workplace organization, or external relations.

Gustafsson et al. (2020) defines service innovation as a new process or offer that is implemented and adopted by and creates value for one or more stakeholders and urged by the innovation attention which has led to significant growth in service firms over the past decade. Technological innovation (including digital media) can give economic value through the adoption and diffusion of new products (Garcia and Calantone, 2002). Technological innovation support firms with 80 equipment's and technologies which put forward new and improved tools/machines that boost the production as well as enhance the success of management (Sheldon, 1983). It also leads to high economic output and delivers new goods and services that have the ability to revolutionize human lives and capabilities (Naude & Szirmai, 2013). Technological innovation is the process of implementing technical knowledge in the form of improved tools/machines with improved performance characteristics to find a viable solution to the perceived need of customers.

EOrganizational innovation is the introduction of something new in the form of an idea, product, service, technology, process, and strategy to an organization. Lam (2006) defines organizational innovation as the creation or adoption of an idea or behaviour which is new to the organization. According to Demircioglu (2016), organizational capability is referring to the refurbishment of ideas and knowledge into new products, services or uninterrupted process for the benefit of the organization as well as its stakeholders. Organizational innovations are not a new marvel, but due to their increased importance for the worldwide rivalry, it has turn out to be a centre of attention for scholars (Steiber, 2012; Armbruster et al., 2008). It is also diligently linked to employees' contentment which would guide to competitiveness.

Fadila et al., (2016) suggest that internal service quality is crucial for the success of new product and service development. Firm's performance refers to the potential and ability of a business to efficiently utilize available resources to achieve targets in line with the set plans of the companies, considering their relevance to the users (Peterson et al., 2003; Taouab & Isor, 2019). Firm performance is an important concept in strategic management research and is often used as a dependent variable to measure the extent to which business goals have been achieved within a specified period of time. It involves assessing the outcomes of a company's strategies and actions in budgetary terms.

Firms need to adopt innovative practices in its service distribution processes to aid their ability to provide various types of customer service, ensuring a better competitive advantage and improve financial performance (Chen et al., 2009). Furthermore, Tugores & Garcea, (2015) argued that investing in innovative activities, whether in overheads or differentiated strategy, is regarded as the central element which in achieving better performance indicators for the firm. Others argue that innovation in service delivery process would augment superior financial performance (Chen et al., 2009; Lin, 2013; Lilly & Luma, 2014).

One strategy for co-creation is a customer involvement. In daily life, for example, engaging customer in the innovation process can involve collecting feedback, conducting surveys, and creating focus groups. Additionally, using social media platforms to gather insights and opinions from passengers regarding their preferences and pain points. Engaging in co-creation practice, as suggested by Hoyer et al. (2010) and Vargo & Lusch, (2008) boosts customer satisfaction, especially the involvement of customers in shaping an offering brings more likely results in value-in-context for all interested parties.
Other than that, employee collaboration, like involving the frontline staff in the innovation process, as they have direct interactions with customers can provide valuable insights. Besides that, fostering a culture of innovation within the organization, where employees feel empowered to share ideas and contribute to service improvements, is essential.

Another strategy involves open innovation partnerships. This strategy involves collaborating with external partners, such as technology companies, startups, and other service providers, to bring in fresh perspectives and expertise. Prahalad and Ramaswamy (2004) suggest that co-creation is a way to "partition some of the work done by the firm and pass it on to its customers". This approach helps in designing products, services, or experiences. Therefore, co-creation is the first order notion that embraces all forms of collaboration practices (co-concepts) and customer contributions (Reniou, 2009).

Data analytics is one of strategies that could lead to service innovation that involves leveraging data analytics to gain insights into customer behaviour, preferences, and trend. This information is used to create personalized experiences. Predictive analytics should be implemented to anticipate customer needs and provide proactive solutions. Coviello and Joseph (2012) and Ramani and Kumar (2008) propose that working together with clients offers eye-catching opportunities to develop innovative products and services that meet customer needs, create value for all interested stakeholders and ultimately contribute to the firm's success (Ramani & Kumar, 2008; Coviello & Joseph, 2012).

EBesides that, adopting agile development methodologies to quickly iterate and implement changes based on feedback and market dynamics is one of the best strategies which involves creating cross-functional teams that can respond rapidly to emerging opportunities and challenges. By organize the co-creation workshops, the changes of idea sessions with stakeholders could be fun way to generate innovative ideas collaboratively. For example, using design thinking principles to encourage a user-centric approach in developing new services.

The technology integration could involve adopting cutting-edge technologies to enhance the passenger experience, such as self-service kiosks, mobile apps, biometrics for security checks, and in-flight entertainment systems. For example, investing in digital platforms that facilitate seamless communication and transactions between the airline and its customers. Other than that, the sustainability initiatives could create the co-create services that align with sustainability goals, such as carbon offset programs, eco-friendly practices, and fuel-efficient technologies. This involves customers participating in sustainability initiatives to enhance their sense of environmental responsibility.

The continuous feedback loop is an important strategy. For example, establishing a continuous feedback loop with customers, employees, and partners to monitor the effectiveness of implemented innovations. Another example is a regularly reviewing and updating services based on changing market conditions and customer expectations. Service management gradually strives to understand the way in which the value is created by means of markets to augment value creation through customer co-production of goods and services, which offer them ample benefits, including better preference fit and satisfying experiences (Archpru et al., 2014; Jaakkola, Helkkula, & Aarikka-Stenroos, 2015; Verleye, 2015).

Last but not least, regulatory compliance ensures that co-created services comply with aviation regulations and industry standards to maintain safety and security. By fostering a collaborative approach, the airline industry can create innovative services that not only meet customer expectations but also differentiate the airline in a competitive market.

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The Revolution of C Programming towards National Development

By Ts.K. Vikneshwaran A/L Keluan Singh

Lecturer Faculty of Science & Technology

In this era of urban living, civilians are unlikely to que up or wait for a physical commercial task involving any form of interaction with another human. Few decades ago, citizens of Malaysia were merely having a conventional approach towards accomplishing their daily routine such as bank transactions, grocery purchasing, responsibilities that involves government or private firms and many more. They felt literally tired and exhausted by waiting for numbers and calls along with carrying physical documents. Moreover, language and communication barriers for under privileged people was really a challenging phase due to dependencies at multi-approach centres. In present day, the situations above are totally contrast and people are having much convenient platforms to accomplish their daily commercial routine for their balanced life.

THE ERA OF DIGITALIZATION

Undoubtedly, upon the revolution of Science and Technology, inventions of Websites, Software and Automation technology has uplifted the lifestyles of civilians from conventional to digitalisation. This remarkable transformation has eased the burden and delay of consumers and also service providers in regardless of field. End-users are able to save time, save cost and save energy which encourages them to have more quality time in their daily routine. The reason behind this is, whereby application software which are more easily known as Apps that becomes user friendly and effective. Civilians from variety of age group, able to conveniently adapt and apply the requirements of the Apps with embedded operating features. Currently, Industrial Revolution 4.0 is becoming the regent of Digitalization era.

THE BACKBONE OF DIGITALIZATION

Even though software applications are being the domain for the users, the backbone of softwares are undoubtedly the programming literacy. Software engineers, Application developers and many more information technology literate workforce majorly contributes for the enhancement and enactment of application softwares. Programming is a technical art where its unique language is only understood by Automation system. There are numerous programming softwares and languages implemented for various information technology applications. Programs embedded in each and every software or application softwares meets the requirements of purpose and produces quality output in designated time. This sophisticated implementation in various commercial sector leads to digitalization impact such as Arithmetic Process, Database design and Development, Information Processing, Data Analytics, Product Commercialization, Healthcare Advisory, Weather Forecast and Monitoring, Global Positioning System, Manufacturing and Production, and Networking.

C PROGRAMMING

C Programming is known as general purpose computer programming language. It was integrated by Dennis Ritchie in 1970. [1] C Programming is unique method that conveniently produces the desired output compared to other programming methods such as Python, Java, and Arduino. The C language applied by programmers are easily adaptable by the drivers embedded in software. Apart from that, as an added advantage, error made in the codes are easily detectable and sortable.

C Programming has been a platform to execute any form of data analysis via authorized software applications used by government or private departments. Data analysis such as personal details verification, financial details verification, job application verification and many more commercial data verifications. [3] These advantages carried by C Programmed softwares enables civilians from either developers or end-users to accomplish their objectives of usage. The main reason behind this convenient approach is due to the program codes such as printf aka print function and scanf aka scan function which helps the drivers in software to understand any form of data such as integer, alphabets, arithmetic operators and many more logic inputs. [4]

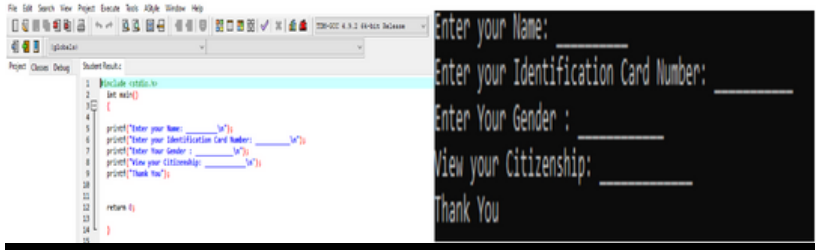

Figure 1: Sample of program code and output of Citizenship verification using print function code.

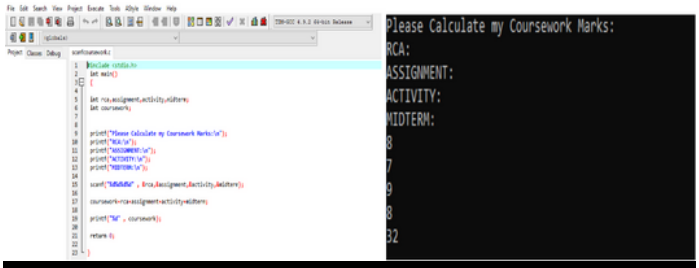

Figure 2: Sample of program code and output of Student Portal Coursework Marks verification using scan function code.

In a nutshell, C Programming has immensely contributed to the Nation's Development in various sectors. The employees and end-users have gained a lot of benefits through these sophisticated features in their daily routine. Programmable platforms assure security in the form of password and security passcode protection in order to view and retrieve any form of data from respective digital platforms. Data analysis and update process executed by Public and Private Service Bodies ensures a faithful service has been provided to the end-users. This successful venture is being developed with more integrity and safety for upcoming generations by Malaysian Communications and Multimedia Commissions (MCMC).

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Figure 3: Sample of program code and output of Student Portal Coursework Marks verification using scan function code.

IN UNICAM

UniCAM opens the door for everyone to embark into the field of C Programming. We do offer short course on learning Basic C Programming Skills. This opportunity helps unleash the talent of becoming a Programmer by nurturing programming skills. Also, add more value in your Curriculum Vitae in order to impress the hirers and secure a qualified job in this competitive world

Aviation Sustainability Programs Propel National Economic Development

By Halida Hajar Anuar

Lecturer Faculty of Management & Hospitality

Aviation sustainability programs have emerged (Karaman,2018) as a critical driver of national economic development. The initiatives, which focus on reducing environmental impact of air travel (Otero,2021) are not only vital for addressing the urgent climate crisis but also offer a pathway to foster economic growth, innovation, and long-term effect. This topic will explore on how aviation sustainability programs can propel national economic development (Charles, 2007) through various avenues such as technological innovation, job creation, and enhancing global connectivity.

The development of new eco-friendly technologies such as electric or hydrogen-powered aircraft (Singh,2023) and more efficient air traffic management systems has the potential to revolutionize the aviation industry. These advancements go beyond reducing carbon emissions (Capaz, 2020) which represent new markets and opportunities for economic activity. Investment in research and development of sustainable aviation technologies can lead to the growth of high-tech industries, fostering a knowledge-based economy. The development of biofuels (IATA,2023) for aircraft not only reduces dependency on fossil fuels but also stimulates agricultural and industrial sectors involved in biofuel production.

The transition to sustainable aviation significantly generates jobs. Implementing new technologies and infrastructures requires a skilled workforce, thus creating employment opportunities in various sectors, including engineering, manufacturing, and services. For example, the construction and maintenance of new sustainable aviation facilities, such as solar-powered airports (solar farm), offer considerable employment prospects which makes the aviation industry to have a lifelong renewable energy and generate more income. Moreover, as nations strive to meet international aviation environmental standards (ICAO), there is an increasing demand for professionals specializing in sustainability, environmental science, and related fields (Sauvé,2016), further contributing to job creation and economic diversification.

Figure 1: Solar farm at south of Kuala Lumpur, Malaysia

Furthermore, sustainable aviation enhances global connectivity in an environmentally responsible way, which is vital for economic development. Air travel is crucial for global trade, tourism, and business. Ensuring air travel more sustainable, nations can continue to reap the economic benefits of global connectivity without exacerbating the environmental impact. This is particularly crucial for developing countries, where aviation can play a significant role in opening up markets and integrating them into the global economy. Sustainable aviation practices can also boost the tourism industry for those concerned about preserving environment.

However, the transition to sustainable aviation requires substantial investment and international cooperation. Governments, industries, and international organizations must collaborate to fund research and development, create regulatory frameworks, and share best practices (Arman, 2018). The cost of developing and implementing new technologies can be high, but the long-term economic, environmental, and social benefits justify the investment.

In conclusion, aviation sustainability programs are not only a response to environmental challenges but also a strategic approach to economic development. By fostering technological innovation, creating jobs, and enhancing global connectivity, sustainable aviation can drive national economies towards a sustainable future.

IN UNICAM

UniCAM offers a Sustainability Compliance Programme designed to empower your team. This cost-effective and practical course provides Malaysian businesses with the tools to reduce their carbon footprint and actively contribute to environmental conservation. Plus, it's claimable under HRDF. Join us now – seats are limited!

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Shaping Future Leaders: How Industry Innovation Affects Human Resources Development in Aviation Sector

By Noorjana binti Abdul Rani

International Student Liason

In the dynamic realm of the aviation industry, the impact of industry innovation on human resources development is profound as per mentioned by Iqbal (2023). Over two decades in HR, the evolution of strategies to align with the industry's advancements has been instrumental in shaping the future leaders of aviation.

The aviation sector is at the forefront of technological innovation, and HR plays a pivotal role in ensuring the workforce adapts to this ever-changing landscape. The focus has shifted to fostering a culture of continuous learning to equip employees with the skills needed to navigate the complexities of cutting-edge aviation technologies.

Leadership within the aviation industry is no longer solely about technical expertise; it demands a blend of interpersonal skills and adaptability. The role of HR is to identify and develop these qualities in potential leaders, ensuring they can effectively steer teams in the face of technological disruptions and industry transformations by editor77 (2022) from Elysium HR Solution and Career Development.

One noteworthy example of technology integration in HR practices in the aviation sector is the use of predictive analytics for talent management as mentioned by Masenya (2022).

By analysing historical data and performance metrics, HR professionals can identify high-potential individuals and tailor development programs to enhance their leadership capabilities. This data-driven approach ensures a more targeted and efficient allocation of resources for cultivating the next generation of aviation leaders.

As we move forward, the symbiotic relationship between industry innovation and human resources development will continue to redefine leadership in aviation. Embracing and integrating technological advancements into HR practices not only prepares the workforce for the challenges of today but also shapes resilient leaders who can navigate the uncertainties of tomorrow's aviation industry.

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Revolutionizing Ground Operations: The Innovation of Autonomous Taxiing Systems in the Airline Industry

By Mohamad Alif Azmiezal bin Mohd Azmi

Lecturer Faculty of Management & Hospitality

The airline industry, perpetually driven by technological advancements, is witnessing a transformative shift in ground operations with the introduction of Autonomous Taxiing Systems (ATS). This cutting-edge technology promises to revolutionize the way aircraft maneuver on the ground, offering improvements in efficiency, safety, and overall operational performance.

Traditional ground operations have long relied on human-controlled tow vehicles and manual aircraft movements. The advent of ATS brings a paradigm shift by integrating autonomous technologies into taxiing processes, enhancing precision, and streamlining operations.

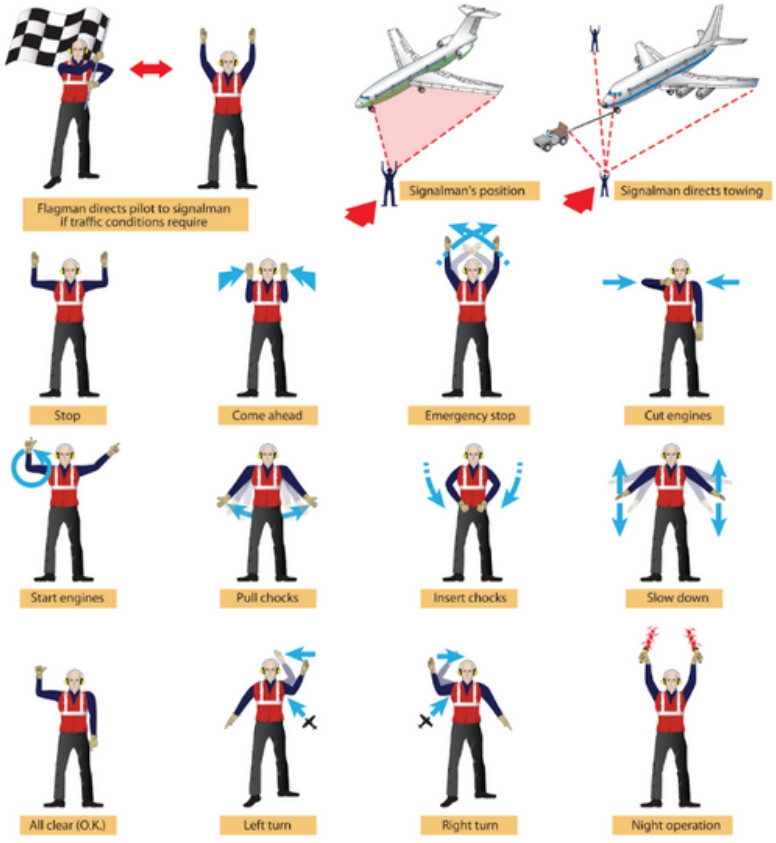

Figure 1: Standard FAA Hand Taxi Signals (Source: aircraftsystemstech.com)

AUTONOMOUS TAXIING SYSTEMS

ATS leverages sophisticated technologies, combining artificial intelligence, sensors, and communication systems to enable aircraft to taxi autonomously. This innovation empowers aircraft to navigate the complex ground environment with minimal human intervention, optimizing routes, and mitigating delays.

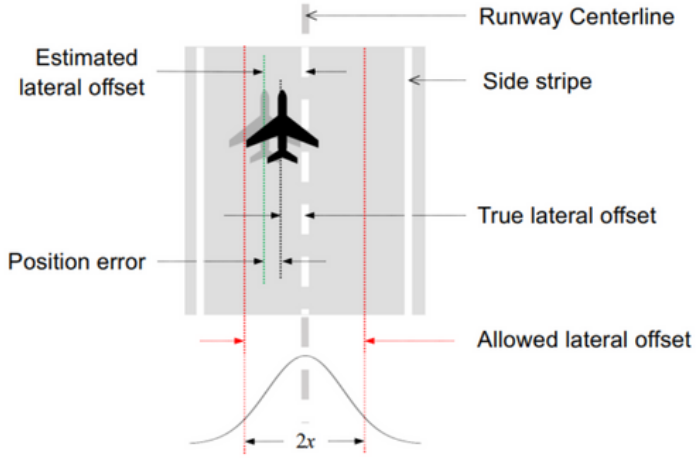

Figure 2: Concept of Operations for Autonomous Taxiing (Source: Erfan Asaadi et al., 2020).

As illustrated in Figure 2, the aircraft is required to maintain alignment with the runway centreline throughout the taxiing process, ensuring that it stays within a specified lateral offset limit of ±2 meters from the centreline.

BENEFITS OF AUTONOMOUS TAXIING SYSTEMS

Operational Efficiency:
The implementation of ATS significantly enhances operational efficiency by reducing taxi times, minimizing congestion, and optimizing airport infrastructure utilization (Smith & Johnson, 2021).

Fuel Efficiency and Emissions Reduction: Autonomous taxiing systems contribute to fuel savings and a reduction in greenhouse gas emissions by optimizing taxi routes and reducing engine run times on the ground (IATA, 2022).

Improved Safety:
The use of autonomous technology in taxiing operations minimizes the risk of human errors, enhancing overall safety on the ground. ATS systems are designed to adhere to stringent safety protocols, reducing the likelihood of accidents during taxiing (FAA, 2023).

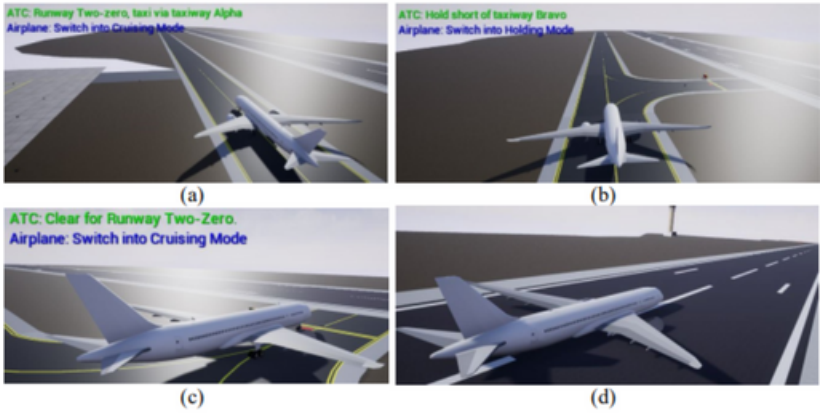

Figure 3: Simulated Autonomous Taxiing Under Normal Conditions (Source: Liu & Ferrari, 2019)

While the potential benefits are substantial, the integration of ATS faces challenges such as regulatory approvals, infrastructure compatibility, and cybersecurity concerns. Addressing these challenges is crucial for the widespread adoption of autonomous taxiing systems.

The emergence of Autonomous Taxiing Systems marks a pivotal moment in the evolution of ground operations within the airline industry. As technology progresses, the seamless integration of ATS is poised to redefine aircraft movements on the ground, delivering tangible improvements in efficiency, safety, and environmental impact. Collaborative efforts among industry stakeholders, continued research, and regulatory support are imperative to ensure the successful and widespread adoption of this groundbreaking technology.

IN UNICAM

University College of Aviation Malaysia (UniCAM) provides a comprehensive range of courses tailored for individuals aspiring to excel in the dynamic field of Ground Operations within the airline industry. Offering specialized programs such as Passenger Ground Services, Flight Planning and Monitoring, Aviation Safety and Security, Airport Operations, and Dispatch Resource Management, students can acquire a profound understanding of the critical facets involved in ensuring smooth and secure air travel. These courses are designed to equip learners with the essential skills and knowledge needed to thrive in various roles within the aviation sector, fostering a well-rounded education that prepares them for the challenges and responsibilities associated with ground operations in the airline industry.

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Converting Waste Palm Oil into Eco-Friendly Aviation Fuel

By Syazaliaa Dzulkernain

Head of Recruitment Unit

In response to the pressing need for sustainable alternatives in the aviation industry, the conversion of waste palm oil into eco-friendly aviation fuel has emerged as a promising solution. This innovative approach seeks to repurpose a byproduct of palm oil production, addressing both environmental and economic concerns. By exploring the conversion processes and potential benefits, this initiative represents a pivotal step towards a more sustainable and environmentally conscious future for air travel.

CONVERTING WASTE PALM OIL INTO ECO-FRIENDLY AVIATION FUEL

Malaysia, a country known for its abundant palm oil output, faces a significant challenge: handling millions of tons of palm waste each year. However, this difficulty also presents a fantastic opportunity: the chance to turn waste palm oil into Sustainable Aviation Fuel (SAF). The country is ready to embark on its historic journey towards a sustainable aviation future. With the help of cutting-edge technology, strategic alliances, and an abundance of palm biomass from Empty Fruit Bunches (EFB) and palm biogas from Palm Oil Mill Effluent (POME), Malaysia is well-positioned to lead the world in the production and use of clean aviation fuel (SAF). Malaysia's commitment to environmental sustainability is evidenced by the National Biomass Action Plan 2023-2030, which was introduced in early December of last year.

This innovative approach opens the door for the development of downstream products by introducing the utilization of waste palm oil in biomass. This aligns with the remarks made earlier this year by Datuk Seri Johari Abdul Ghani, the recently appointed Minister of Plantation Industries and Commodities.

THE PROBLEM OF PALM WASTE

Malaysia produces an astounding 50 million tons of palm garbage yearly, making it the second-largest producer of palm oil worldwide. Traditionally, waste materials such as empty fruit bunches (EFB), palm kernel shells (PKS), palm oil mill effluent (POME), and fronds are burned, disposed of in landfills, or allowed to decay, releasing greenhouse gases and contaminating the environment.

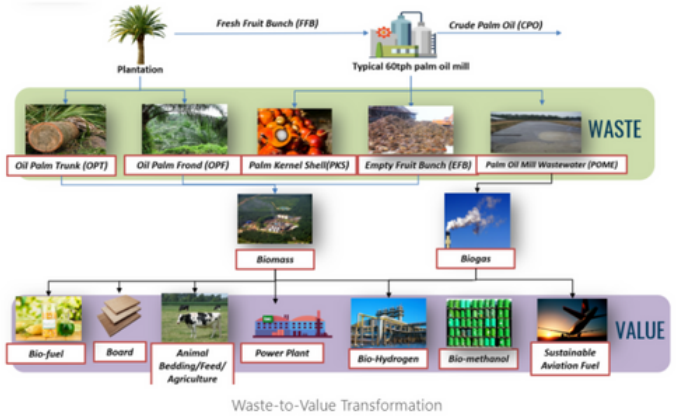

Figure 1: Waste to value transformation of palm oil.

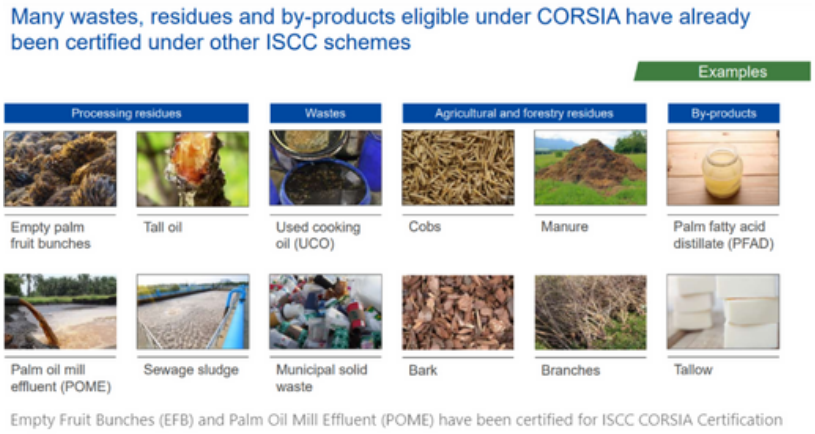

Figure 2: Waste, residues and by-product from palm oil.

TWO PATHS TO SUSTAINABLE AVIATION FUEL ARE THE SOLUTION

Methane and carbon dioxide are produced during the anaerobic digestion of palm waste to make biogas. The methane component of biogas can be converted into methanol, although direct conversion of biogas to methanol and Sustainable Aviation Fuel (SAF) is uncommon. This methanol can then be processed using recognized methods, including the Fischer-Tropsch process, to create Sustainable Aviation Fuel (SAF).

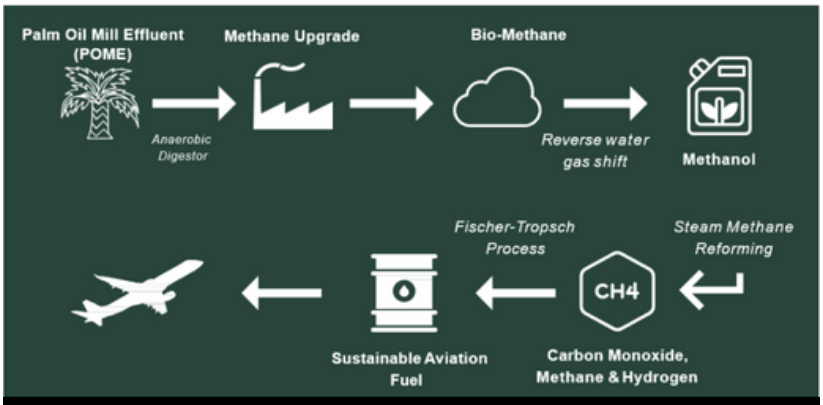

Figure 3: Palm Oil Mill Effluent (POME) Pathway to Sustainable Aviation Fuel (SAF).

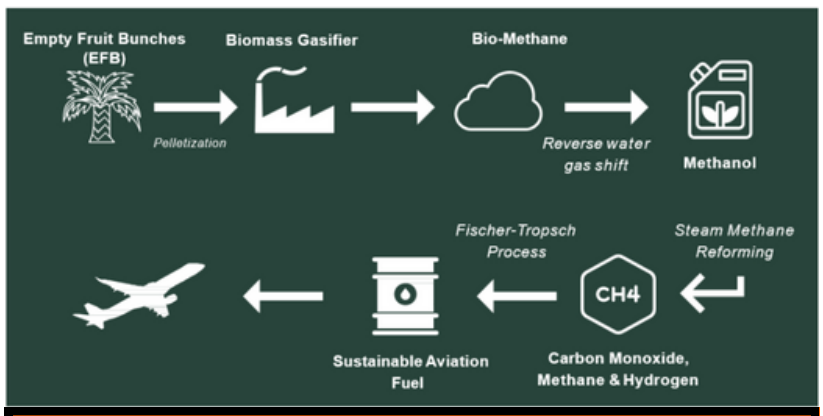

Figure 4: Biomass Pathway to Sustainable Aviation Fuel (SAF).

Methanol-to-Jet Technology (MTJet)

The International Air Transport Association (IATA) is now in the certification process for the Methanol-to-Jet (MTJet) technology. Notably, significant firms in the market like Nacero and ExxonMobil are currently working on developing methanol-to-jet fuel. The cooperation of ExxonMobil and Nacero suggests that the companies are working hard to advance the technology and potentially include jet fuels made from methanol in regular aircraft operations.

There is hope for the future as long as Malaysia supports cooperative efforts to fully utilize palm trash. Imagine a future where planes powered by locally produced Sustainable Aviation Fuel (SAF) fly over Malaysia. This desire, which emphasizes the country's dedication to environmentally responsible practices and sustainable energy solutions, is not only a vision but also a concrete and attainable goal.

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Advanced Materials Revolutionizing Aerospace Design

By Izham bin Rasdi

Sales & Marketing Executive

In the dynamic world of aerospace engineering, relentless pursuit of innovation and advancements in materials play a pivotal role in shaping the future of flight. The 1903 Wright Flyer was constructed with wooden frame and muslin fabric wings. While these materials served the world's first airplane well, modern aircrafts need something a little more reliable. This paradigm shift is ushering in a new era in aerospace design, where advanced materials are at the forefront of innovation. Additionally, engineers are hard at work on innovative new products, and they could change human flight as people know it. Space exploration and commercial aviation have changed considerably since their inception. The materials used in aerospace have advanced the industry in many ways such as reducing weight, withstanding harsh conditions and improving passenger comfort and safety.

Many historic aerospace materials no longer have use in the industry. For example, wood has fallen out of favour due to its ability to rot, inconsistent weight, and susceptibility to insect damage. Instead, engineers look for strong, human-made materials, evaluating each one based on factors such as function, production and properties. One of the most important material properties is lightness. Reducing a component's density leads to a more fuel-efficient plane with better climb rates and G-force loading. Studies have found reducing weight is three to five times more effective than increasing stiffness or strength. Here are some of the most exciting advancements in advanced materials used in aerospace.

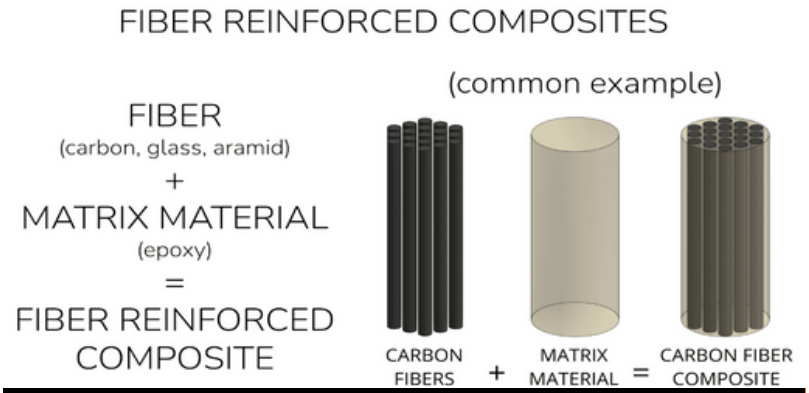

Figure 1: Fiber Reinforced Composites

COMPOSITE MATERIALS

Composite materials are made of two or more different materials combined to create a material with unique properties. In aerospace, composite materials have been used for decades to reduce weight, increase fuel efficiency, and enhance structural integrity. Carbon fiber reinforced polymers (CFRP) are due to their high strength-to-weight ratio, resistance to fatigue, and corrosion resistance (Zhang, J. et al. 2023).

NANOMATERIALS

Nanotechnology is used to develop new materials with unique properties at the nanoscale. For example, nanocomposites combine nanoparticles with traditional composite materials, enhancing mechanical properties. Nanocoatings can be applied to surfaces to improve thermal insulation, wear resistance, and corrosion protection. Additionally, nanomaterials are used in energetic materials, such as propellants and explosives, to enhance their performance (Wilfred L.F. Armarego, 2022).

SMART MATERIALS

Smart materials, also known as intelligent materials, are designed to respond to changes in their environment. Shape memory alloys (SMA), for instance, change shape in response to temperature fluctuations, allowing for morphing structures and adaptive systems. Electroactive polymers (EAP) can change shape when stimulated by electricity, making them useful for actuators and sensors. Intelligent materials are explored for various aerospace and defense applications, including adaptive structures, responsive landing gear, and bright skins (Vladimir Buljak et al. 2021)

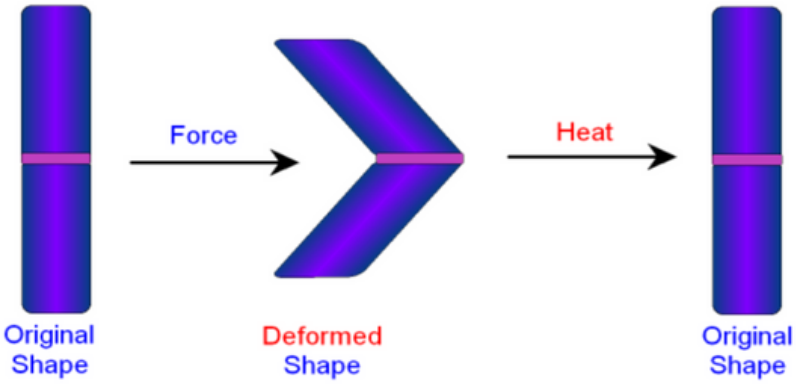

Figure 2: Deforming and Re-forming process

METAMATERIALS

Metamaterials are artificial materials engineered to have specific properties not found in nature. They are composed of arrays of repeating elements, often at the nanoscale, which allow them to manipulate electromagnetic waves, acoustic waves, and other phenomena. In aerospace and defense, metamaterials are researched for cloaking devices, perfect absorbers, and advanced sensors (Muhammad Tawalbeh et al. 2022).

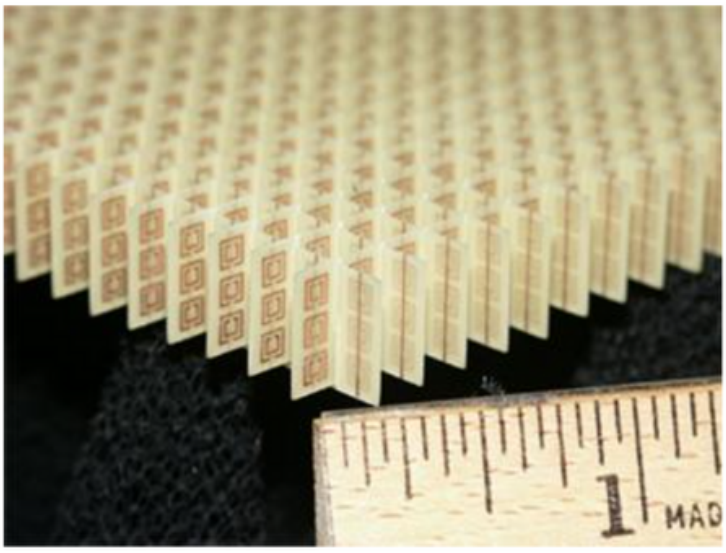

Figure 3: Negative-index metamaterial array configuration

Graphene and 2D Materials

Graphene, a single layer of carbon atoms arranged in a hexagonal lattice, is one of the most robust materials known, with exceptional electronic and thermal conductivity. It is explored for various aerospace applications, including lightweight composites, advanced electronics, and energy storage systems. Other 2D materials, such as transition metal dichalcogenides (TMDs), are also being studied for their unique optical and electronic properties (Ashok Srivastava et al. 2022).

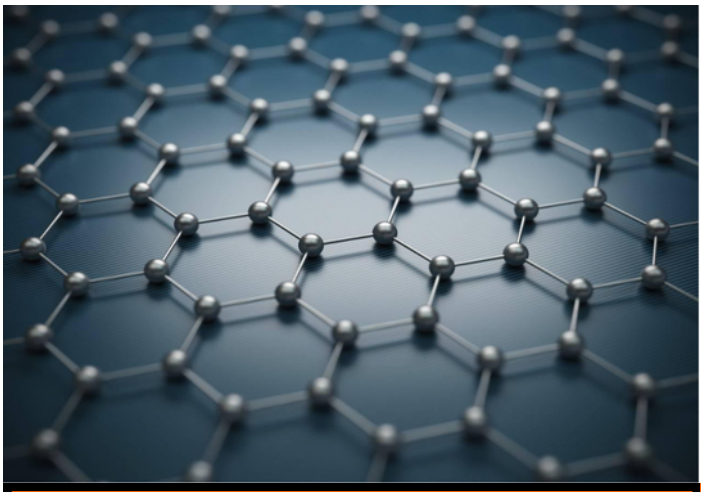

Figure 4: Graphene layer in a hexagonal lattice

Additive Manufacturing

Additive manufacturing (AM), also known as 3D printing, allows for the creation of complex geometries and custom parts without molds or tooling. This technique has revolutionized the production of aircraft parts, allowing for lighter, more efficient designs. AM is used to create novel materials and structures, such as hollow spheres and lattice structures, which cannot be produced using traditional manufacturing methods (Xue Ting Song et al. 2022).

Advanced materials are transforming the aerospace industries, creating lighter, more robust, and more efficient systems. From composite materials to graphene, nanomaterials, innovative materials, metamaterials, and additive manufacturing, these cutting-edge technologies drive innovation and push the limits of what is possible. As research has grown more advance, we can expect even more exciting developments in advanced materials for aerospace industry.

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The Enhancement of Artificial Intelligence in The Academic Industry in Malaysia: Impact to Teaching and Learning

By Haziqah binti Shahabudin

Academic Registrar

In today's digitals era, digitals technologies have gained popularity across various industries, including academia. The acceptance of academic industries on digitals technology increases drastically especially the implementation of AI (Artificial Intelligence). Artificial intelligence (AI) is the idea and practice of creating computer systems capable of tasks such as voice recognition, decision-making, and pattern recognition that traditionally needed human intellect. In easy way to understand, artificial intelligence studies how to create computers with human-like cognitive abilities (Staff, 2023).

AI APPLICATION IN EDUCATION INDUSTRY

Artificial Intelligence in Education refers to the use of AI technologies and instruments to improve and optimize the process of teaching and learning. It comprises combining data analytic techniques, algorithms, and intelligent systems to offer students with customized and flexible learning experiences. In teaching and learning or Pengajaran dan Pembelajaran (PdP), the system of artificial intelligence (AI) has been widely applied to improve quality education (Abdullah, Maskur, & Abdul Mutalib, 2020). It cannot be denied that Artificial Intelligence in education is gaining popularity especially among teachers and students.

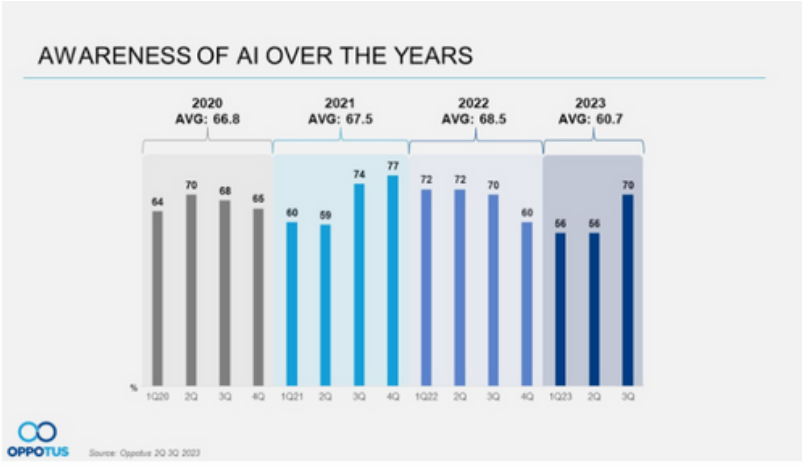

Figure 1: Graf of awareness of AI over the year (Asha, 2023,)

IMPACT TO TEACHING AND LEARNING

Traditional educational systems often face various challenges, including disparities in the accessibility and quality of education, a lack of resource, and difficulties in adapting to the changing needs of society.

Artificial intelligence (AI) can assist educators by automating administrative duties like report generation and assessment marking. This allows educators to allocate more time for lesson planning, provide individualized attention to each student, and foster critical thinking skills by reducing time spent on routine tasks. AI can also be used to develop curriculum that are more dynamic and relevant. By leveraging the AI's analytical capabilities, courses can be customized to anticipate future career trends and market demands apart from equipping students with employable skills.

Moreover, AI can provide students with personal tutoring. AI can provide one-on-one learning opportunities for students who need additional support outside the classroom. Chatbots and AI instructors can respond to students' inquiries and hone them.

Figure 2: Face to face teaching method (Hairul, Y. N. 2023)

APPLICATION OF AI IN UNICAM

Toward becoming best private university college in Malaysia, University College of Aviation Malaysia (UniCAM) has also integrated Artificial Intelligence into its education system. The involvement of AI in the learning system at UniCAM can be seen through the use of Turnitin. Turnitin has allowed students and educators to check similarity to avoid plagiarism in their work. Turnitin compares a student's work to an archive of online documents, internet data, a repository of past submitted papers, and a subscription repository of magazines, journals, and publications to detect textual similarities throughout an assignment.

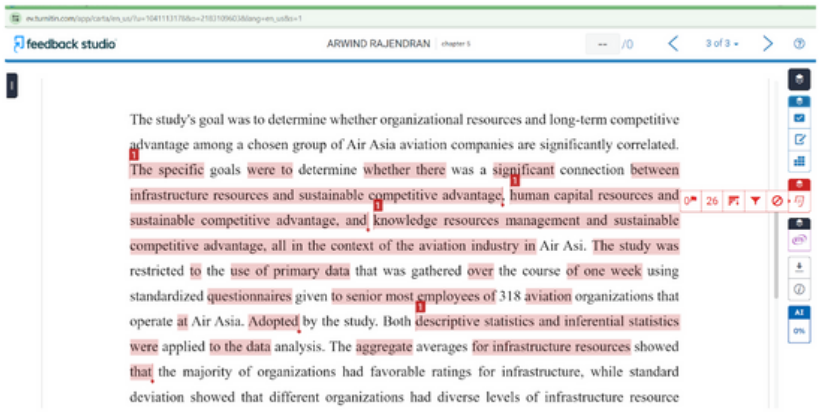

Figure 3: Turnitin similarity detection on students' assignment

In summary, AI in the education system is an important tool for simplifying daily tasks for both educators and students. Overall, artificial intelligence has enormous promise for improving education. It is believed that through the use of technology, education can become more effective, inclusive, and ready for the next generation of learners. The existent of AI is just a technological tool to help humans in daily activities. However, considering the potential benefits and drawbacks for its users, every technology development comes with its cost. It goes back to the limits of the use of AI to the individual himself so that the goodness of AI is not misused.

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