

Business & Social Sciences

High School

Generational Views on a 4-Day Workweek (BSH001)

Shinting Liu, Taichung Municipal Hui-Wen High School

This study examines how different age groups perceive the four-day workweek and its impact on productivity, well-being, and business operations. The results show overall positive attitudes, especially among younger workers, while older workers and managers express more concerns about efficiency and productivity.

Forget the Middle: Why Only the Best and the Last Matter (BSH002)

Jen Chen, Junyi School of Innovation & Shaun Zheng, Junyi School of Innovation

Human memory does not recall experiences by averaging every moment. Instead, it relies on a “highlight reel” dominated by emotional extremes (The Peak) and the final impression (The End). We are going to analyze how Costco leverages this psychological principle to drive customer satisfaction.

Is Taiwan’s 108 Curriculum Reform Working? Challenges, Pressures, and the Path Forward (BSH003)

Isa Hsieh, Washington High School

Taiwan’s 108 Curriculum Reform was introduced to promote competency-based education by emphasizing critical thinking, interdisciplinary learning, and student adaptability beyond traditional exam-focused systems. While the reform aims to better prepare students for future challenges, its implementation has revealed significant obstacles, including insufficient teacher preparedness, unequal educational resources, and increased student stress caused by learning portfolios and diversified academic demands. This study analyzes the primary challenges associated with the reform and evaluates their impact on both educators and students. It further proposes strategic solutions, including enhanced teacher training, enriched curriculum design, expanded digital and practical learning opportunities, and stronger student counseling systems. By addressing these structural and practical issues, Taiwan can better bridge the gap between policy goals and educational reality, ensuring that the 108 Curriculum Reform achieves its intended purpose of fostering holistic, future-ready learners.

The Value of Virtual Skins for Players: A Study on the Consumer Psychology and Motivations of Purchasing In-Game Skins (BSH004)

You-Wei Wen, Shin Shing High School, Wei-Hung Chen, Shin Shing High School, Po-Chien Chen, Shin Shing High School & Tsai-Ni Kuo, Taoyuan Municipal Pingjen Senior High School

This study investigates how "cosmetic skins," which do not affect game balance, generate significant revenue within the mainstream "Free-to-Play" business model, while analyzing the psychological motivations behind paying for virtual items that offer no competitive advantage. Based on 200 valid survey responses, the research found that while an overwhelming 85.7% of players show a willingness to purchase, their behavior remains rational, with 72.7% restricting monthly spending to under NT\$1,000, indicating a clear "micro-spending" trend characterized by low-cost, incremental purchases. Regarding motivation, emotional factors significantly outweigh utility; the primary drivers are "affinity for the character" (68.6%) and the appeal of "exclusive collaboration skins" (65.7%), demonstrating that players prioritize emotional attachment over simple cost-performance ratios. Furthermore, although nearly half of the respondents log over three hours of playtime daily, this high level of engagement does not translate into reckless spending, as most players maintain disciplined financial habits. The study concludes that virtual skins have become essential mediums for emotional expression and identity; therefore, the gaming industry should focus on creating "emotional premiums" through deep character engagement rather than competing solely on price or functional attributes.

Decoding the Complexity-Bias Link: Human Strategic Deviations in Nim Games (BSH005)

Sz-Shiuan Chen, National Hsin Hua Senior High School, Li Fen Huang, National Hsin Hua Senior High School & Zhi-Jun Ye, National Hsin Hua Senior High School

This study investigates how mathematical complexity impacts human decision-making in Nim games. By quantifying complexity through Grundy values (MEX) and analyzing 900+ player decisions, the research identifies a predictable decay in accuracy that allows for the design of bias-aware AI counter-strategies.

[Methodology]. The framework distinguishes between linear move sets (odd numbers) and non-linear move sets (square numbers). While linear sets offer simple patterns, square sets create complex patterns that challenge human intuition.

[Experimental Results]. The findings reveal a Quadratic Decay Model for accuracy as Grundy levels (G) increase, following the equation: $y = -1.25x^2 - 14.75x + 95.75$ ($R^2 = 0.9935$). A significant gap was observed: humans maintain 95% accuracy in simple patterns but drop to 41% as complexity reaches $G=3$.

[Strategic AI Applications]. The study identifies "Cognitive Vulnerability Zones" (G=2 and G=3) where human intuition fails. Based on this, an AI Bias-Guidance Strategy was developed to increase win rates by steering opponents into these "Drop Zones."

[Conclusion]. Aligned with global research, the study proposes a "Closed-Loop Teaching Model" (Substitution, Judgment, Verification, Teaching, and Counter-strategy) to help bridge these cognitive gaps and improve strategic education.

From Fans to Founders: A Social Media-Driven Analysis of Youth Consumer Behavior in Student-Led Fan Event Micro-Entrepreneurship (BSH006)

Kai-Ting Tsai, Kang Chiao International School (Linkou Campus)

This study investigates the cyclical relationship between social media engagement, fan motivation, and consumer behavior within student-led K-pop fan events. Rather than examining a single isolated activity, this research adopts a systems-thinking approach by analyzing a two-phase fan-driven initiative: an idol birthday support event whose surplus revenue was strategically reinvested into a subsequent anniversary exhibition. This reinvestment model forms the foundation of a proposed Fan-Driven Cycle, in which social media engagement leads to participation, participation generates revenue, and revenue enables the expansion of future events.

Data will be collected via a Google Forms questionnaire targeting 30 to 50 valid respondents, measuring key variables including Instagram exposure and interaction, purchasing behavior, spending amount, participant satisfaction, and perceived value. Cross-phase comparisons will assess whether reinvestment resulted in measurable growth in participation and community engagement.

The findings aim to identify the critical factors driving youth consumer behavior in fan contexts and to demonstrate how grassroots fan activities can evolve into sustainable, self-reinforcing systems. This research contributes practical insights for student organizers and independent event planners seeking to design fan-oriented events with long-term impact and operational continuity.

A Study on Factors Influencing Campus Adaptation and Self-Reflection of High School Students from Highly Sensitive Groups (BSH007)

Yu-Chen Cheng, National Hsin Hua Senior High School

This research project investigates Sensory Processing Sensitivity (SPS) among high school students, aligning with the Business & Social Sciences category by examining psychology, human behavior, and educational systems.

Grounded in the DOES model—encompassing Depth of processing, Overstimulation, Emotional reactivity, and Sensing the subtle—the study employs a mixed-methods approach combining quantitative surveys (HSP and HSC-School scales) with qualitative self-narratives.

The findings reveal that 31.1% of students are "Orchids" (highly sensitive), with a significant gender disparity: the detection rate for females (38.6%) is nearly double that of males (19.3%). This gap highlights how social gender expectations and role perceptions influence the disclosure of sensitive traits. Quantitatively, High Sensitive Persons (HSPs) report significantly higher environmental loads (83.4%) and lower adaptation scores compared to the general group, identifying physical noise and social evaluation as primary stressors.

The study validates the "Vantage Sensitivity" theory, demonstrating that while HSPs are more vulnerable to negative environments, they exhibit superior adaptation and growth when provided with external support from teachers and peers. Qualitative data further describes the experience of "social fatigue" but also highlights "compensatory agency," where students leverage their deep processing talents to navigate campus life.

To build an inclusive educational ecosystem, the research proposes institutional strategies: optimizing physical environments with "Quiet Zones," strengthening teacher-student secure attachments, and promoting self-regulation strategies.

By deconstructing gender stereotypes and providing targeted support, schools can transform sensitivity from a psychological burden into a competitive advantage for academic innovation. This project offers a scientific framework for social institutions to better accommodate neurodiversity.

Politics, Economy, and Power (BSH008)

Max Zhan, Washington High School

This topic focuses on global political economy, starting with capital growth and wealth distribution, to explore how economic development affects social inequality. I begin by analyzing charts depicting trends in capital accumulation and wealth concentration, and by comparing tax, education, and social welfare systems across countries to illustrate how these systems influence individuals' opportunities to accumulate wealth. I am also examining the positions of countries such as the United States, China, and Germany in technological development and export competition to understand that the world is moving towards multipolarity rather than a single dominant power.

ESG Factors and Purchasing Behavior Among High School Students (BSH009)

Xuan Li, Washington High School

This study explores the relationship between ESG factors and purchasing behavior among high school students. In recent years, sustainability and environmental awareness have become increasingly important issues in society. However, whether these values truly influence consumers' purchasing decisions remains unclear, especially among teenagers. Therefore, this research aims to examine how ESG concepts affect students' buying behavior and how price influences their final decisions.

University

The Influence of Social Media on Generation Z's Purchasing Decisions (BSU001)

Daria Chen, Feng Chia University, Emily Gao, Feng Chia University & Tiffany Huang, Feng Chia University

With the development of digital technology, social media has become an important part of the daily lives of Generation Z. Platforms such as Instagram, TikTok, and YouTube not only provide entertainment and communication but also profoundly influence consumer purchasing behavior. This study aims to explore the impact of social media on Generation Z's purchasing decisions.

The study will target university students aged 18 to 25, collecting data on their social media usage habits, purchasing experiences, and opinions on influencer recommendations, online reviews, advertising content, and peer interactions through questionnaires.

Expected results show that social media has a significant impact on Generation Z's purchasing intentions, with authentic recommendations, engaging visual content, and trending topics being the most effective. The research findings can serve as an important reference for businesses planning digital marketing strategies targeting young people.

The Impact of Short Video Marketing on Brand Awareness (BSU002)

Carol Zhou, Feng Chia University, Claire Zhang, Feng Chia University & Sharon Hong, Feng Chia University

In recent years, short video platforms have rapidly emerged, with TikTok, Instagram Reels, and YouTube Shorts becoming crucial tools for brand promotion. This study aims to explore whether short video marketing can effectively enhance consumers' brand awareness and recall.

The study will target university students aged 18 to 25, collecting data on their short video usage habits and changes in their brand impressions, favorability, and purchase intentions after watching brand short videos through questionnaires. It will also analyze the differences in the impact of different content formats, such as creative storylines, product demonstrations, and influencer collaborations, on brand awareness.

Expected results show that short videos can effectively increase brand exposure and recall, with creative, entertaining, and authentic content showing the best results. The research findings can provide companies with references for developing digital marketing strategies, helping brands effectively reach young consumers.

A Ninja is Silent, But His Farts are Visible (BSU003)

Noir Liao, Feng Chia University

This project uses the everyday embarrassment of “farting” as its entry point, transforming a common social mishap into a humorous yet insightful narrative through visual storytelling. Its core objective is to reveal the psychological defense mechanisms people employ when facing threats to their social image. Based on face theory and a framework combining social risk and level of agency, the project develops five “ninja techniques”: starting from low-risk avoidance (“play dead”), to remedial action (“take a deep breath”), and progressing toward more manipulative strategies such as “creating a distraction,” “seizing the initiative,” and ultimately the high-risk “shifting the blame.” These techniques illustrate a progressive spectrum of behavioral responses in awkward situations.

Targeting Gen Z audiences, the design incorporates chibi-style ninja characters and humorous symbols to reduce embarrassment and foster relatability. By applying the Elaboration Likelihood Model (ELM), the project balances rational understanding with emotional engagement, achieving a communication effect that is “instantly understood and humorously relieving.” Ultimately, it encourages viewers to reflect on their own and others’ social behaviors through laughter.

Gen Z Buying Behavior on TikTok (BSU004)

Walaiporn Junyakai, Feng Chia University, Weanika Choowong, Feng Chia University & Toshu Tanaka, Feng Chia University

This poster explores the buying behavior of Generation Z on TikTok and how the platform influences consumer decision-making. As short-form video content becomes increasingly popular, TikTok has transformed from an entertainment platform into a powerful marketing tool. The study focuses on how trends, influencers, algorithms, and emotional engagement affect Gen Z consumers’ purchase intentions. In addition, it examines the role of fear of missing out (FOMO), social influence, and personalized content in encouraging impulse buying behavior. The findings highlight that TikTok marketing is highly effective because it creates interactive and relatable experiences that connect with younger audiences. This topic demonstrates the growing impact of social media marketing on modern consumer behavior and provides insights into digital marketing strategies targeting Gen Z consumers.

How Generative Artificial Intelligence Appropriation drives employees’ mental well being and innovative behavior: The moderating role of transformational leadership (BSU005)

Jake, Chinese Culture University, Lynn, Chinese Culture University & Steven, Chinese Culture University

The rapid spread of Generative Artificial Intelligence (GenAI) is transforming how employees interact with digital technology in modern organizations. However, current research remains limited in explaining how employees appropriate and integrate GenAI into their work processes, as well as the impact of this process on employee outcomes. Based on Adaptive Structural Theory (AST), this study conceptualizes Generative Artificial Intelligence Appropriation (GAIA) as a high-level structure comprising Adaptive Appropriation (AA), Customized Appropriation (CA), Ethical Appropriation (EA), Integrative Appropriation (IAP), and Interface Appropriation (IFA). Using survey data from 616 employees in Vietnam and analysis using Partial Least Squares Structural Equation Modeling (PLS-SEM), this study examines the relationship between GAIA, Employee Engagement (EAG), Employee Learning Agility (ELA), Employees' Dynamic Capabilities (EDC), Mental Well-being (MWB), and Innovative Behavior (IB), while also considering the moderating role of Transformational Leadership (TFL). The results show that GAIA has a positive impact on learning agility and dynamic capabilities, thereby promoting innovative behavior and mental well-being, while the relationship between GAIA and employee engagement is not supported. Furthermore, transformational leadership enhances the impact of GAIA on learning agility. This study contributes to expanding AST in the context of generative AI, and clarifies the competency mechanisms through which AI exploitation influences employee outcomes. In practical terms, the results suggest that organizations should focus on AI literacy, competency development, and leadership styles that support learning to effectively leverage generative AI in the workplace.

Liberal Learning and International Business: Preparing Global Graduates for a Changing World (BSU006)

Adebomi Oyajuyiti Oyayomi Olaita, Tunghai University

This study examines debates on the integration of liberal learning within the rigorous academic environments of East Asian universities, with particular attention to lessons for Taiwan's preparation of international business graduates. Drawing on regional scholarship, the study explores how liberal learning has been adapted to accommodate exam-oriented systems, intense credential competition, and a persistent emphasis on employability. Rather than positioning East Asian education systems as competitors, the analysis treats each case as a contextual example of locally embedded reform. The research investigates strategies for integrating liberal learning into Taiwanese universities while preserving core cultural traditions, communication practices, and academic standards. It focuses on institutional and social factors shaping these initiatives and evaluates whether broader learning objectives can be embedded within existing curricula rather than added as extra requirements. This approach responds to concerns in the literature regarding student workload and scepticism toward curricular reform in high pressure academic contexts. Recent studies suggest that liberal learning can function effectively in East Asian academic systems only when adapted to local contexts rather than directly replicating Western models. This

insight is especially relevant in Taiwan, where exam-oriented education, credential competition, and strong parental and societal expectations shape student experiences. Consequently, many scholars advocate adapting existing educational structures rather than replacing them. From an international business perspective, this study argues that liberal learning should prioritise preparing graduates for uncertainty in global markets, supporting judgment in complex cross-cultural situations, and complementing technical business competencies within a broader educational framework.

Chinese Nationalism Sentiments on Xinjiang Cotton Incident (BSU007)

Yu-I Lin, Wenzao University of Languages

This study examines how nationalist sentiments are discursively constructed and manifested in Chinese consumer behavior through an in-depth qualitative analysis of the Xinjiang cotton controversy. As rising nationalism reshapes China's consumption landscape, the intersection of political consumerism and digital activism has become increasingly evident, particularly within online platforms such as Xiaohongshu. Drawing on the concept of Political Consumerism, Framing theory and Social Identity Theory, this research explores how online users frame nationalist narratives, express cultural confidence, and align consumption choices with patriotic identity.

Using qualitative discourse and content analysis, this study examines 110 online commentaries across ten posts related to the Xinjiang cotton incident to identify recurring linguistic framings and messages that link economic behavior with national pride and resistance to foreign influence. The findings provide insights into diverse consumer perspectives on the incident, revealing a growing sense of economic nationalism expressed through support for domestic products, while also reflecting rational consumer awareness. Moreover, the study uncovers several issues and side effects within the community, such as the over-commercialization of nationalism and the emergence of opposing voices as public attention toward the incident began to decline.

By integrating sociolinguistic and socio-political perspectives, this research contributes to understanding the mechanisms through which digital nationalism influences consumer behavior in China's contemporary market environment. It highlights how nationalism functions as both a cultural and economic force, shaping perceptions of foreign brands amid ongoing geopolitical tensions.

How Does Consumer Behaviour Influence Food Waste? A Study of Tunghai University Students (BSU008)

Richard Timothy, Tunghai University & Melinda Cahya Dhea Rizti, Tunghai University

Food waste has become a significant environmental issue globally, including Taiwan. For instance, in Taichung, approximately 280 metric tons of food waste are disposed of daily, placing pressure on local waste management systems. Despite increasing awareness of sustainability issues, role of youth consumer behavior remains underexplored. According to previous studies, consumers in developed countries like Taiwan are among the biggest sources of food waste and it is driven by price sensitivity, impulse buying, and consumption habits. This study adopts a mixed-method approach, combining a quantitative questionnaire survey ($n \geq 50$) and qualitative interviews ($n = 5$) conducted among students at Tunghai University. The findings are expected to examine how purchasing behavior, consumption habits, and environmental awareness influence food waste among students, and to provide insights for promoting more sustainable food consumption within the university community. In addition, this project serves as a part of an electronic commerce course project, RAMAH, a food rescue application designed to reduce food waste through digital redistribution of surplus food while creating economic value. RAMAH is not just a platform—it is a step toward a more sustainable and socially responsible future.

The Impact of Social Media Misinformation on Voter Perception and Political Dynamics in Taiwan: Learning from Other Countries' Counter Disinformation Strategies (BSU009)

Pei Wen Wu, Wenzao University of Languages, Yan Zhi Fang, Wenzao University of Languages & Ying Chi Tsai, Wenzao University of Languages

This research aims to examine the proliferation of fake news during Taiwan's election periods and its impact on Taiwanese voters. We compared censorship mechanisms in other countries to identify potential improvements for Taiwan. First, we used questionnaires to analyze the extent and factors influencing voters' exposure to fake news, identified primary channels through which voters obtain misinformation, and examined whether voters' motivations for using social media affect their ability to discern fake news. We further investigated the cognitive and emotional impacts of fake news on voters, including misperceptions of candidates' images and policies, as well as potential feelings of anxiety, anger, or distrust. Finally, this study compared Taiwan's response strategies and attitudes toward fake news, such as verifying sources, relying on fact-checking platforms, or engaging in social media discussions and contrast them with international countermeasures and mechanisms. This comparison aims to reveal differences in information literacy across varying political cultures and media environments. Through this research, we aim to investigate how fake news impacts elections and public perception, providing insights for enhancing media literacy and introducing international media oversight mechanisms.

The Sustainability Value Bridge: How Integrated ESG Management Transforms Social Advocacy into Long-term Brand Equity at O'right Inc. (BSU010)

Chloe Chen, Tunghai University

For a business to thrive while maintaining sustainability, sustainability must transition from a peripheral cost to a core strategic engine. This project explores the "Value Bridge" at O'right Inc., an integrated model that directly links environmental actions to market success. By investigating the mechanisms that allow a medium-sized enterprise to achieve 100% renewable energy use while expanding globally, this project highlights how a sustainability department functions as the primary link between internal ESG data and external brand influence.

During my internship, I experienced how rigorous data management translates technical ESG metrics into the narratives that build stakeholder trust. A core component of this strategy is the application of Social Return on Investment (SROI) within a "Green Accounting" framework. This methodology allows the organization to quantify the business value of qualitative social advocacy, transforming environmental commitment into a measurable economic asset.

Through this value bridge, O'right demonstrates that verified sustainability is not just a moral choice but a critical survival mechanism for long-term profitability and international resilience.

The Impact of Artificial Intelligence Adoption on Financial & Operational Performance on Financial Firm (BSU011)

William Reinaldo Chandra, Tunghai University & Felix Bellarmino Immanuel S, Tunghai University

This study investigates the impact of Artificial Intelligence (AI) adoption on firm performance among financial sector companies listed on the Indonesia Stock Exchange (IDX) over the period 2022–2025. Using a 338 initial sample before screening, and that the final sample used in the analysis is 210, it employs pooled Ordinary Least Squares (OLS) regression with robust standard errors to examine the effect of AI adoption on two performance indicators: Return on Assets (ROA), as a proxy for operational performance, and Return on Equity (ROE), as a proxy for financial performance. Control variables include leverage (LEV), firm size (SIZE), price-to-book ratio (PB), and firm age (AGE). The empirical results reveal a positive and statistically significant relationship between AI adoption and ROA, indicating that firms with greater AI engagement tend to achieve higher operational efficiency and more effective asset utilization. In contrast, the effect of AI adoption on ROE is positive but statistically insignificant, suggesting that the benefits of AI adoption for shareholder returns may require a longer time horizon to materialize. Leverage is also found to exert a significant negative effect on ROA, while firm size is the only control variable with a significant positive effect on ROE. These findings suggest that AI adoption contributes more

immediately to operational efficiency than to shareholder returns, and that its broader financial impact is likely to emerge over the longer term. This study contributes empirical evidence from an emerging market context and offers practical implications for managers, investors, and policymakers on the strategic value of AI investment in the financial sector.

A Faceless Reality: When Truth is Fabricated by Choice (BSU012)

Ruo Chi Huang, Feng Chia University, Chih Chun Kang, Feng Chia University & Zi Ting Fang, Feng Chia University

Amidst the rapid advancement of digital technology today, AI deepfake technology has completely shattered the golden rule of "seeing is believing." This theme, A Faceless Reality: When Truth is Fabricated by Choice, delves into how image and audio forgery is reshaping the public's perception of reality. When faces can be easily swapped and news footage flawlessly simulated, the information we receive is no longer an objective reality, but rather a product of deliberate "selection" and "generation" by those with ulterior motives. This project aims to expose the crisis of trust hidden behind digital algorithms, awaken public awareness of media literacy, and explore how we can reclaim control over discerning the truth in an era where the line between reality and fabrication is increasingly blurred.

Promoting Sufficient Consumption: A Sustainable Solution for Fast Fashion and Luxury Footwear (BSU013)

Hao-Ting Hsieh, Tunghai University

The fast fashion industry has grown rapidly in recent years, but it has also caused serious environmental problems, such as pollution, resource waste, and large amounts of textile waste. At the same time, the luxury and hype-beast footwear market is becoming more popular, especially among young people. Although these products are often seen as higher quality, their production still consumes a lot of resources and contributes to environmental issues.

This study focuses on the idea of "sufficient consumption," which encourages people to buy less, use products for a longer time, and make more thoughtful purchasing decisions. The main goal of this research is to explore whether this concept, together with a resale system, can help reduce the negative environmental impact of both fast fashion and luxury footwear.

This research uses a combination of different methods. First, previous studies and reports are reviewed to understand the current situation of the fashion industry and sustainability issues. Then, a survey and interviews are conducted to understand how consumers think about second-hand products, and what factors might stop them from buying used items. In addition, this study also

tries to design a simple resale platform using social media to see if it is practical and acceptable for users.

It is expected that promoting second-hand markets and encouraging sufficient consumption can help reduce waste, extend product lifecycles, and improve people's awareness of sustainability. This research also hopes to provide some practical ideas for consumers, businesses, and policymakers to move toward a more sustainable fashion system.

Beyond the Price Tag: How Greenwashing and Self-Identity Influence Gen Z's Green Premium Willingness (BSU014)

Becka Wang, Tunghai University, Karina Ceng, Tunghai University & Queenie Pu, Tunghai University

This preliminary study investigates Taiwanese university students' willingness to pay a green premium for sustainable apparel amidst the prevalence of fast fashion. While environmental awareness and the "Green Chic" concept have popularized eco-conscious consumption, a value-action gap persists; students frequently revert to low-cost fast fashion due to price sensitivity and convenience. Employing Freudian Theory as an exploratory framework, this undergraduate research analyzes the internal psychological conflict between the Id (driven by immediate gratification for cheap, trendy clothing) and the Superego (motivated by ethical responsibility). Furthermore, the study examines how "greenwashing" disrupts actual Green Purchase Intentions by eroding consumer trust, thereby reducing Green Premium Willingness. Ultimately, initial findings indicate that the willingness to pay for sustainable fashion extends beyond financial constraints - it is profoundly influenced by self-identity expression and the perceived authenticity of a brand's green marketing. This research provides critical foundational insights into the psychological barriers preventing young consumers from transitioning to sustainable alternatives.

Feed the Feed: Analyzing the Impact of User-Generated Content vs. Brand Imagery on Gen Z Dining Choices (BSU015)

Hillary Celine Hartono, Tunghai University, Natalia Aurielle Gozali, Tunghai University & Vanessa Tiffany Layardi, Tunghai University

This research explores how Instagram food photos influence restaurant selection decisions among university students. Today, many students rely more on social media platforms than traditional menus or advertisements when deciding where to eat. Instagram, in particular, has become an important source of information because students are constantly exposed to food-related content shared by restaurants, influencers, and other users. This study focuses on how Instagram food photography affects the Information Search and Evaluation of Alternatives stages in the Purchase Decision Process. The research applies Consumer Perception Theory to understand how students

respond to visual food content through the stages of exposure, attention, and interpretation. It also uses Bases of Market Segmentation by focusing on Generation Z university students, a group known for being highly active on digital platforms and preferring authentic experiences and peer opinions over traditional advertising methods. The study compares the influence of official restaurant posts and user-generated content (UGC), such as food photos shared by friends, influencers, or customers. Using the concepts of intrinsic and extrinsic cues, the research examines whether casual and unedited food photos appear more trustworthy and realistic than professionally edited restaurant images. The findings suggest that university students are more influenced by peer-generated content because it helps reduce perceived risk before visiting a restaurant. Students often see user-generated posts as more honest and reliable since they provide realistic expectations about food quality, portion sizes, prices, and restaurant atmosphere. The study concludes that authentic customer posts and social proof are more effective in influencing student dining decisions than highly polished commercial photography.

Strategic Feasibility and Comparative Analysis of TCM-Based Functional Foods for Long-Term Gastrointestinal Conditioning (BSU016)

Calvin Chen, Tunghai University

This study aims to evaluate the mechanistic superiority and sustainable development potential of an innovative Traditional Chinese Medicine (TCM) gastrointestinal formulation within the modern preventive medicine market. A significant therapeutic gap exists in current interventions: traditional probiotics are susceptible to degradation by gastric acid and lack immediate efficacy for acute symptoms, whereas chronic reliance on over-the-counter (OTC) medications, such as proton pump inhibitors, is associated with adverse effects including nutrient malabsorption and microbiome dysbiosis. Viewed through the lens of Sustainable Science and Management (SSM), this study employs a systematic literature review (SLR) and comparative matrix analysis to assess the pharmacological mechanisms and market viability of the proposed TCM formulation. Results indicate that the formulation operates via a "dual-action mechanism": achieving rapid gastric acid neutralization (within 15-30 minutes) through sodium bicarbonate, while utilizing botanical extracts like Citri Reticulatae Pericarpium and Magnoliae Officinalis Cortex for long-term gastrointestinal motility regulation. Furthermore, the incorporation of peppermint effectively mitigates the organoleptic barriers typical of TCM, enhancing consumer compliance. In conclusion, this formulation offers a safe, long-acting scientific alternative. Its development strongly aligns with the United Nations Sustainable Development Goal 3 (SDG 3) and ESG criteria, demonstrating substantial commercial potential in the field of sustainable health management.

The Influence of Electronic Word-of-Mouth on Hotel Selection: Evidence from Instagram and OTA Platforms (BSU017)

Stephanie Annabella, Tunghai University, Nadia Carolina Hartono Tee, Tunghai University, Jovianne Christensen Santosa, Tunghai University & Chelsea Gabriela Tunghai University

As social media platforms redefine the hospitality landscape, travelers increasingly distinguish between aesthetic inspiration and transactional reliability. This research investigates the shifting weight of social proof, noting that while Instagram serves as a powerful tool for brand awareness, the electronic word-of-mouth (eWOM) found on Online Travel Agency (OTA) platforms remains the authoritative driver of actual booking intentions. The study is framed through reference group theory, analyzing how distinct digital environments influence the decision-making process. Instagram functions as an aspirational reference group, providing value-expressive influence that appeals to a consumer's "ideal self." Conversely, OTAs act as the primary comparative reference group by providing informational influence. Through the aggregation of verified user data and statistical ratings, OTAs exert expert power that builds essential consumer trust. This trust is the critical mechanism for mitigating perceived risk, as travelers prioritize the "functional validation" of high-density peer reviews over curated visual content when making financial commitments. Furthermore, the objective nature of OTA ratings minimizes cognitive dissonance, ensuring that consumer expectations align with reality. Findings suggest that these reference groups dominate distinct stages of the consumer journey. While the "dreaming" phase is initiated by visual storytelling, the final conversion is dictated by the empirical evidence found on booking engines. The research concludes that traveler choice is highly segmented by trip purpose and the need for objective certainty. Ultimately, this contributes to marketing psychology by demonstrating that a professional segmented marketing strategy must utilize OTAs as the definitive "trust anchor" to successfully convert aspirational interest into confirmed behavioral action.

Outfit Reels, Hauls, and Stories: The Effect of Instagram Influencer Content on Gen Z Impulse Buying in Fast Fashion (BSU018)

Georgia Devanie Richella Wijaya, Tunghai University, Brisa Chen, Tunghai University, Shannon Audrey Tjandra Tunghai University & Janessa Marsey Heaven Tunghai University

This preliminary study investigates Gen Z impulse buying behavior in the fast fashion industry, focusing on Instagram influencer content such as outfit reels, hauls, and stories. Grounded in the Stimulus–Organism–Response (SOR) framework, Instagram influencer content is conceptualized as the stimulus, cognitive and emotional responses represent the organism, and impulse buying behavior forms the response. The Attitude Model (cognitive–affective–behavioral framework) is also integrated to explain how consumers first develop cognitive evaluations (e.g., trust and perceived value) and emotional reactions (e.g., excitement and desire), which subsequently shape impulsive purchase decisions. Findings indicate that Instagram Reels strongly trigger emotional

arousal and Fear of Missing Out (FOMO), leading to unplanned purchases. Haul content enhances perceived credibility and social proof, increasing consumer trust and product desirability through influencer testimonials. In contrast, Instagram Stories, characterized by their ephemeral nature, generate lower cognitive involvement, but their frequent exposure contributes to habitual and subconscious purchasing tendencies over time. Social Influence Theory further explains that influencers function as opinion leaders who shape consumer attitudes, reinforce social conformity, and promote trend adoption among Gen Z. This research provides critical foundational insights into the psychological and social mechanisms through which Instagram influencer content drives Gen Z impulse buying behavior in fast fashion consumption.

The Relationship Between Smartphone Addiction and Academic Performance (BSU019)

Sierra Chen, Tunghai University & Violin Wang, Tunghai University

In today's rapidly developing era, smartphones are undeniably becoming an inseparable part of daily life. People around the world use smartphones daily either for texting, studying, finding information, entertainment, and gaming. While they offer many benefits and make communication easier, using them too much has caused worries about how they affect students' school performance. A study in the *Global Journal of Health Science* by John Damiao and Catherine Cavaliere, called "The Relationship between Smartphone Addiction and Academic Performance in College Students," found that smartphone addiction negatively affects students' GPA and academic results. Few studies have looked at how too much smartphone use, especially apps like TikTok affects students' attention in class. Even during lectures, individuals focus more on short videos than on the lesson itself, which shows that smartphones can lower focus and productivity for university students. (Liao et al., 2026)

This poster looks at the connection between smartphone addiction and academic performance in university students. Not only does it focus on the connections between smartphone addiction and academic performance, but it also studies how screen time and relying on smartphones affect students' focus, study habits, and class participation. The research used online surveys with students from different fields. Results show that too much smartphone use is linked to lower concentration and trouble managing study time, which we could see in today's real life world. (Liu et al., 2024) Many students said that entertainment apps and social media often distract them during studying and lectures. (Sánchez-Fernández & Borda-Mas, 2022) However, some students also said that smartphones help with schoolwork when used for learning and finding information online. (Amez et al., 2021, pp. 584-608)

Roots Vs. Routes: How Cultural Heritage and Reference groups shape food brand loyalty in Taiwan (BSU020)

Jeremy Hansel Wijaya, Tunghai University, Devohn Gerrard, Tunghai University & Jonny William Asquith, Tunghai University

Taiwan's culinary landscape is defined by a tension between cultural "Roots" and global "Routes." This research investigates the shifting determinants of brand loyalty, moving beyond quality to examining how cultural heritage and reference groups shape the "Taiwanese" diner. Cultural "Roots" reflect consumers' emotional attachment to traditional Taiwanese flavors and heritage brands, while social "Routes," such as peer influence and global food trends, increasingly affect consumer preferences and loyalty.

"Roots" are defined through factors such as Values and Emotional Value, where nostalgic attachments anchored in Episodic Memory and traditional heritage. These elements foster a sense of continuity, often manifesting as Behavioral Loyalty passed down through family practices and cultural traditions. Conversely, "Routes" represent macro-environmental influences, specifically the Referent Power of Reference Groups such as social media content creators and peer "foodie" communities. These groups drive Observational Learning, redefining values around "aesthetic" and "Instagrammable" consumption. Drawing from consumer behavior, culture, memory, and social influence, this study examines how emotional attachment and digital communities interact in shaping brand loyalty among Taiwanese consumers.

Employing a Mixed-Methods approach, the research combines Descriptive Research via quantitative surveys to measure loyalty metrics with Interpretive Research through qualitative interviews to capture nostalgic narratives. The study further explores how Generational Subcultures moderate this balance. It analyzes whether younger consumers are more influenced by the social appeal of global brands or the familiarity and cultural value of traditional local food culture. Ultimately, this research provides insights into cultural identity, how it continues to shape brand loyalty in Taiwan.

Can Chatbots Make Up for Their Own Mistakes? Examining the Dual Effects of Warm Responses in AI Service (BSU021)

Eileen Yang, National Taipei University of Business

Chatbots have become a central part of modern customer service. However, service failures involving chatbots are inevitable. When these failures are not properly addressed, consumers are less likely to continue using the service, posing a real risk of customer loss for businesses. This study examines how warm chatbot responses influence consumer continuance intention in service recovery contexts. Drawing on the Computers as Social Actors (CASA) framework and Attribution Theory, a dual-pathway model is proposed. Warm responses are argued to operate through two

competing mechanisms. On one hand, warmth can enhance social presence and generate positive emotions, which strengthens continuance intention. On the other hand, overly affective language may be seen as an attempt to manipulate or conceal the failure, triggering negative motive inferences and weakening recovery outcomes. Implicit Person Theory is introduced as a moderating variable. It captures how consumers with different mindsets, specifically incremental versus entity theorists, interpret warm responses differently. Data are collected using a quasi-experimental design combined with a survey. Hypotheses are tested through structural equation modeling via SmartPLS. The findings aim to clarify the competing roles of warm responses in service recovery, fill theoretical gaps in human-chatbot interaction research, and provide practical guidance for businesses using conversational AI in customer-facing roles.

Willing to Pay for Carbon-Offset Options on Airline Tickets (BSU022)

Jade Lotjar Alberttar, Tunghai University, Benjamin Xie, Tunghai University, Chris Chang, Tunghai University & Ethan Song, Tunghai University

The aviation industry faces increasing pressure to reduce carbon emissions and promote sustainable practices. This study examines the relationship between environmental awareness, climate action, and travelers' willingness to support Sustainable Aviation Fuel (SAF) initiatives within the context of green travel behavior. In particular, the research investigates whether guilt mitigation influences passengers' intentions to choose environmentally responsible airline options and pay for sustainability-related surcharges. A quantitative survey was conducted among airline passengers, and the collected data were analyzed using regression and structural equation modeling techniques. The findings indicate that environmental awareness positively affects support for SAF and green travel intentions, while guilt mitigation significantly moderates passengers' climate action behaviors. The study further reveals that travelers who perceive higher personal responsibility for carbon emissions are more likely to support sustainable aviation initiatives. These findings contribute to the growing literature on sustainable consumer behavior and provide practical implications for airlines seeking to promote SAF adoption and environmentally responsible travel choices.

When Green Claims Meet Reality : Expectation Disconfirmation in Sustainable Tourism (BSU023)

Allison Lin, Tunghai University & Marie Chang, Tunghai University

Green marketing has become an important strategy in the hospitality industry as consumers increasingly value sustainability and environmental responsibility. However, the growing use of green marketing has also raised concerns about greenwashing, which refers to misleading or

exaggerated environmental claims. This study explores how eco-label trust and skepticism toward greenwashing influence consumers' booking intentions in the hotel industry.

Based on the Expectation–Disconfirmation Model, this poster examines how consumers form expectations through hotel sustainability claims and how negative disconfirmation occurs when actual hotel practices fail to meet those expectations. The poster further explores how misleading eco-labels reduce consumer trust and negatively influence hotel booking intentions.

The finding suggests that credible and transparent eco-labels may positively influence booking intention, while unclear or misleading environmental claims can increase consumer skepticism and reduce trust in hotel brands. Furthermore, negative disconfirmation may lead to dissatisfaction and lower purchase intention.

This study highlights the importance of authenticity and transparency in sustainable hotel marketing. The findings provide insights for hospitality marketers seeking to build long-term consumer trust while avoiding the negative effects of greenwashing.

Exploration of LCC and FSC in Different Generation (BSU024)

Anne Lin, Tunghai University, Anna Jiang, Tunghai University, Janice Wang, Tunghai University & Akari Sashihara, Tunghai University

This study explores the differences in attitudinal loyalty toward full-service carriers and low-cost carriers among Generation X, Y, and Z in Taiwan. The research analyzes how safety perception, service expectations, travel motivation, and digital interaction influence airline preferences across generations. Findings suggest that Gen X demonstrates stronger loyalty toward full-service airlines, while Gen Z shows greater psychological attachment to low-cost carriers due to digital convenience and perceived cost-performance value.

Natural & Environmental Sciences

High School

Exploring the Environmental Impacts of Urban Green Corridors: Insights from Taichung Green Railway and High Line Park (NEH001)

Yu Han Tseng, Hsinchu County Liuo-Jia Senior High School

Modern urban planning is mostly focused on greening, and the frequency of street trees and other green plants on the streets is gradually increasing. Through the Taichung Green Railway in my own living area and the famous High Line Park in New York, I was inspired to think about the impact of urban green belts on the environment. So I created this explanatory poster by referring to online literature.

Principal Component Analysis (PCA) of TCGA Breast Cancer RNA-seq Data Reveals Molecular Subtype Separation (NEH002)

Elle Chen, International Bilingual School at Tainan Science Park

Breast cancer is a heterogeneous disease made up of molecular subtypes that differ in gene expression, clinical behavior, and treatment response. Because RNA-seq data measure thousands of genes at once, it can be difficult to identify meaningful patterns directly from the full dataset. Principal component analysis, or PCA, is a dimensionality reduction method that simplifies high-dimensional data while preserving major sources of variation.

This project will use publicly available TCGA-BRCA RNA-seq data from UCSC Xena to investigate whether PCA can reveal molecular subtype separation in breast cancer. Samples will be grouped using known subtype labels, such as Luminal A, Luminal B, HER2-enriched, and Basal-like. After filtering low-expression genes and normalizing the expression matrix, PCA will be applied to reduce the data into principal components. The resulting plots will be colored by subtype to evaluate whether samples with similar molecular features cluster together. Subtype separation may also be assessed using silhouette score or clustering agreement.

I hypothesize that PCA will show partial separation of breast cancer subtypes, especially between biologically distinct groups such as Basal-like and Luminal tumors. This project aims to demonstrate how computational analysis can transform complex genomic data into interpretable visual patterns. By connecting gene expression differences to molecular subtype structure, this study supports the broader goal of using bioinformatics to improve cancer classification and precision medicine research.

Defense Strategies for the Quantum Era (Q-Day): Lightweight Performance Evaluation of Post-Quantum Cryptography (NEH003)

Chih-Chuan Wang, National Tainan Second Senior High School, Po Cheng Lin, The Affiliated Chu Pei Senior High School of National Yang Ming Chiao Tung University, Wei-Bo Huang, National Tainan Second Senior High School & Hung-Yueh Lin, Pu-Men Senior High School

As quantum computing advances, current encryption standards such as RSA may become vulnerable, threatening modern financial and communication systems. This project compares traditional encryption (RSA-2048) with post-quantum cryptography algorithms such as CRYSTALS-Kyber using Python or C# scripts. The experiment measures key generation time, encryption/decryption speed, and memory usage under different input sizes. The poster presents the Q-Day threat, experimental performance comparisons, and an evaluation of PQC feasibility in resource-constrained environments.

Development of a Campus Carbon-Tracking Dashboard: Bridging Data Visualization and Sustainable Awareness (NEH004)

Erh-Wen Chang, National Hsin Hua Senior High School, Chih Heng Chao, National Chutung Senior High School & Shau-Yi Chen, National Nanke International Experimental School

While most universities collect energy data, it is rarely presented in a way that students can understand or act upon. This project presents EcoVisual, a self-developed dashboard prototype aimed at making campus sustainability "visible."

Unlike static reports, our system focuses on real-time data transformation. We use Python (Pandas) to process raw energy logs and the Streamlit framework to build an interactive frontend. The core feature is a custom-coded conversion algorithm that translates standard kWh and EUI (Energy Use Intensity) into more relatable metrics, such as "trees planted" or "equivalent CO2 reduction."

Through this interactive interface, international students can directly monitor the environmental footprint of specific campus buildings. By providing this transparency, the project demonstrates how simple data tools can drive behavioral change, turning abstract climate goals into tangible campus-wide participation.

Analysis of Viscous Effects on Spherical Motion under Wall Effects Using Power Law and Exponential Function Models-from Faxen law to Bessel function (NEH005)

Lu Yu Cheng, Taipei Municipal Yangming High School & Zi Yu Ou, Taipei Municipal Yangming High School

Our research project used Falling Ball Method to determine the viscosity coefficient based on Stokes' law. However, due to wall effects, the calculated viscosity values showed systematic overestimation. Therefore, Faxén's correction was applied to reduce the error caused by the finite tube diameter. Additionally, using NumPy, the relationship between the tube diameter-to-sphere diameter ratio and viscosity was fitted with a power-law model, achieving an R^2 value of 0.995. In addition to the power-law fitting, we found that an exponential function provided an even better fit, with an R^2 value as high as 0.9979.

We speculate that this result originates from Faxén's original derivation, which used the method of reflections to approximate a power-series relationship, producing a structure similar to a Taylor expansion. However, the correct treatment should also consider the cylindrical geometry of the tube. Therefore, starting from Stokes' law and applying cylindrical boundary conditions through the cylindrical solutions of the Bessel equation, this study attempts to explain why an exponential function better matches the experimental data under cylindrical boundary conditions.

University

Hybrid Chitin-Alginate Bioplastic: A Sustainable and Biodegradable Alternative for Packaging (NEU001)

Deven Ken Yohandra, Tunghai University

Plastic waste mismanagement has been one of the prevalent issues since the 20th century up until now. The aim of this study is to produce an efficient alternative to petroleum based plastic made from a composite of chitosan and alginate that is anti-microbial, able to biodegrade, and has comparable properties to conventional plastic products. Chitosan is chosen because of its abundance in nature, second only to cellulose. It also has low toxicity, is biocompatible, anti-microbial, and has excellent properties that make it a promising choice for a plastic alternative. Alginate is also chosen because of its non-toxicity, biodegradability, biocompatibility and unique gel-forming characteristics, and it is soluble in water, making it easy to process. The composite of these polysaccharides has been observed in hydrogels and hydrosols to have a complementary effect. The sodium alginate addition to the composite improves the flexibility, while Chitosan improves its thermal resistance. Simultaneously, the interaction between these two polymers positively affects its mechanical strength. The polymeric structure of chitosan-alginate was the result of ion interactions.

When Human Tire Reefs Failed, Can Bacteria Restore the Ocean? — A Case Study of *Sporosarcina Pasteurii* (NEU002)

Pei-Chen Wei, National University of Kaohsiung

Microbially induced calcium carbonate precipitation (MICP) research has traditionally focused on homogeneous sandy soils. However, recent studies have suggested that this technology can also be applied to marine solidification and structural restoration.

In 1972, the Osborne Reef tire reef project in the United States caused large-scale marine pollution. Approximately 2 million discarded tires were dumped into the ocean, with the original intention of creating an artificial reef. However, the chemical composition and structural instability of tires were overlooked. Instead of forming a stable habitat, the tires damaged existing coral reefs through physical impact and continuously released heavy metals into the marine environment. More than 50 years have passed since the incident, yet over 500,000 tires are still estimated to remain underwater.

This study focuses on *Sporosarcina pasteurii*, a well-known bacterial species widely used in MICP research, as the primary research subject. The aim is to explore its potential application in restoring

marine damage caused by the Osborne Reef tire reef incident. While ongoing efforts continue to remove the remaining tires, marine ecosystem restoration is equally important.

Sporosarcina pasteurii secretes large amounts of urease, which efficiently catalyzes urea in the environment, producing carbonate and ammonium ions. This process increases the environmental pH and promotes calcium carbonate precipitation, a material composition similar to that of coral reefs. Compared to conventional concrete commonly used for crack repair, *Sporosarcina pasteurii* based mineralization has significantly lower carbon emissions and higher biocompatibility. Therefore, this study proposes its potential as a sustainable marine restoration strategy.

The Impact of Nutrient Imbalance on Dinoflagellate Outbreaks in Closed Marine Aquariums A Case Study (NEU003)

Benson Wu, Tunghai University

Dinoflagellate outbreaks are one of the most challenging problems in reef aquariums. Unlike common algae, dinoflagellates can adapt to unstable environments and survive under nutrient-limited conditions.

Recent studies show that nutrient imbalance (low N:P ratio), rather than high nutrient levels, is a key factor driving these outbreaks.

In natural reefs, nutrients remain low but balanced, maintaining microbial stability. However, in closed aquarium systems, nutrient fluctuations caused by feeding and limited filtration can disrupt this balance and favor opportunistic organisms such as dinoflagellates.

Evaluating Retrofitting Strategies and Certification Pathways for Private Buildings in Taiwan—A Case Study of Tunghai University's PG Building (NEU004)

Nadia Chang, Tunghai University

To achieve Taiwan's net-zero 2050 goals, retrofitting existing buildings remains overlooked. This study addresses this gap by analyzing a case study of Tunghai University's PG Building, evaluating EEWH-RN (Existing Building Renovation) feasibility under subtropical conditions. Using institutional data, on-site observations, and literature review, an assessment is made of existing energy/water baselines, EEWH prerequisites, and retrofit options like reflective paints, dual-flush toilets and aerators. Findings confirm the PG Building's feasibility for retrofit certification with mandatory Daily Energy Conservation and Water Conservation prerequisites (>20% reduction) plus CO₂ Reduction (structural reuse >50%) and Waste Reduction Indicator (achieving standard

values of $PI_e=0.9$ and $PI_a = 0.6$). This framework prioritizes low-disruption, scalable strategies with practical alternatives, accelerating private retrofitting adoption.

Comparative Study of ESG Disclosure and Environmental Practices in Sustainability Reports of Four Technology Companies: Apple, NVIDIA, AMD, and Intel (NEU005)

Jasmine Qiu, Tunghai University

This project aims to compare and analyze the sustainability reports of four leading global technology companies: Apple, Nvidia, AMD, and Intel. The research focuses on the importance of these sustainability reports, their disclosure levels, ESG performance, key focus areas, and each company's specific sustainability initiatives.

Public disclosure through sustainability reporting enhances transparency, facilitates external stakeholder oversight, and reflects the companies' actual efforts and achievements in environmental, social, and governance (ESG) aspects.

The motivation for this project is to observe, through detailed analysis of the reports, the depth of attention and proactive engagement of these companies regarding environmental issues such as carbon neutrality, energy transition, and supply chain management. This project further explores how this industry leaders leverage ESG strategies to respond to the global sustainability movement and shape industry standards.

For example, Apple commits to achieving carbon neutrality across its entire value chain by 2030, prioritizing renewable energy and material recycling; Nvidia focuses on energy efficiency in data centers and aims for 100% renewable electricity; AMD emphasizes improving energy efficiency and reducing supply chain carbon emissions; Intel highlights net-zero emissions, water conservation, and waste reduction.

This comparative analysis is expected to clarify trends in corporate sustainability reporting and provide valuable references for promoting ESG practices in the technology industry.

Quantum Dots in Biomedicine: Current Advances, Clinical Challenges, and Future Directions (NEU006)

Maggie Su, Tunghai University

Quantum dots (QDs) have emerged as highly promising materials among inorganic nanomaterials due to their unique properties, such as high photostability and tunable emission spectra. Unlike other traditional organic fluorophores, QDs allow for wide surface modification to improve stability in complex biological fluids because of their high surface-to-volume ratio. These features

make QDs revolutionary tools in the biomedical field, particularly for bioimaging, drug delivery, and biosensing.

Recently, research has shifted from traditional heavy metal QDs toward more biocompatible and sustainable options, including carbon-based QDs and non-toxic semiconductor variants. This transition is driven by the urgent need to reduce inherent toxicity and environmental risks, offering a safer profile for long-term monitoring within living systems.

However, several challenges still need to be addressed. Issues like long-term toxicity, metabolic pathways in the body, and the difficulty of large-scale production still limit their clinical use. This review summarizes the latest progress in QD synthesis and surface modification for biological applications. We also evaluate the major safety concerns and bottlenecks that persist in the field. Finally, we discover the future trends, focusing on multifunctional "theranostic" platforms that combine diagnosis and treatment, aiming to provide a clear perspective for the next generation of precision nanomedicine.

Smart, pH-Sensitive Tapioca Starch Bioplastics Reinforced with Eggshell Powder and Calcium Carbonate for Sustainable Food Packaging (NEU007)

Kay Lin, Tunghai University

Tapioca starch-based films incorporating natural colorimetric indicators offer a sustainable route toward intelligent food packaging by replacing petroleum-derived plastics with biodegradable materials and reducing food waste through freshness monitoring. In this study, pH-responsive bioplastic films were prepared from tapioca starch and butterfly pea flower extract, with eggshell powder (ESP) derived from household food waste and commercial calcium carbonate (CaCO_3) used as inorganic fillers to modify film structure and functionality. The films were cast under acidic conditions (pH 3.0-3.5) and evaluated in terms of drying behavior, visual morphology, and color response during the spoilage of chicken breast stored at room temperature for up to 4 days. All formulations initially exhibited a deep blue color and showed a progressive shift toward lighter blue-green hues as storage time increased, confirming visible sensitivity to alkaline volatile compounds released during meat decomposition and demonstrating real-time freshness indication at the package surface. Incorporation of ESP and CaCO_3 reduced film transparency and altered surface texture relative to the control, with ESP films appearing more granular and CaCO_3 films smoother and slightly lighter, while maintaining the pH-responsive colorimetric function. By combining waste-derived fillers, starch from renewable resources, and an edible plant-based indicator, this student project illustrates a simple, low-cost approach to smart and more sustainable packaging films that can support circular-economy goals and help consumers judge poultry freshness more accurately, thereby potentially mitigating avoidable food waste.

Size-Controlled Cu₂O Nanocubes via NaOH-Assisted Scalable Synthesis for Efficient CO₂ Electroreduction (NEU008)

Samuel Liu, Tunghai University

Cuprous oxide (Cu₂O) nanocubes have emerged as promising catalysts for the electrochemical CO₂ reduction reaction (CO₂RR) due to their facet-dependent activity and selectivity. However, scalable synthesis methods that maintain precise morphological control and high reproducibility remain limited. In this study, we report a facile and scalable wet-chemical route for the synthesis of uniform Cu₂O nanocubes using sodium hydroxide (NaOH) as a key morphology-directing and pH-controlling agent. By systematically tuning reaction parameters—including NaOH concentration, precursor ratio, reduction kinetics, and temperature—we achieve well-defined nanocubes with controlled edge lengths and narrow size distributions. The synthesis protocol is further extended to larger batch volumes, demonstrating excellent scalability without compromising structural uniformity or phase purity. Comprehensive characterization via transmission electron microscopy (TEM), and High resolution transmission electron microscopy (HRTEM) confirms the formation of highly crystalline, phase-pure Cu₂O nanocubes with dominant {100} facets. Electrochemical evaluation reveals that the as-synthesized nanocubes exhibit enhanced catalytic performance toward CO₂RR, with improved selectivity for carbon-rich products and suppressed hydrogen evolution, attributed to the exposed cubic facets and optimized surface structure. This work provides a practical and scalable strategy for producing Cu₂O nanocubes and highlights their potential for efficient and selective CO₂ electroreduction.

Biocompatible Hydrogel based on alginate, bentonite and carbonated water for wound dressing application (NEU009)

Nathan Cahyadi, Tunghai University

Hydrogels are widely used as wound dressings due to their high-water retention, biocompatibility and the ability to absorb wound exudates. Excessive adhesion to skin can lead to wound expansion when hydrogels swell and cause tissue damage. This research focuses on the development of low-adhesion, low-swelling hydrogel dressing using alginate, calcium carbonate, carbonated water and bentonite as a reinforcing agent. Upon the addition of carbonated water, the slightly acidic environment facilitates the release of Ca²⁺ ions from CaCO₃, allowing rapid crosslinking of alginate to form a hydrogel network. Additionally, CO₂ generated during this process would diffuse out to the atmosphere, minimizing acidification and allow the hydrogel to reach a pH suitable for wound dressing. Bentonite is incorporated to enhance the mechanical and structural strength of hydrogel without compromising swelling behavior. Different CaCO₃ concentrations were explored to evaluate their effects on gelation rate and network formation. Preliminary observations indicate that the incorporate of bentonite improves the integrity of the hydrogel while maintaining biocompatibility, with no evidence of Cyanotoxic effects. The hydrogel in this research

demonstrates a favorable pH environment, integrity and structural strength as an effective wound dressing material. This study highlights the possibility of using alginate and bentonite in a gas – generating system to produce a functional, biocompatible for biomedical applications.

Fast Fashion Consumption and Environmental Awareness Among Young Consumers: A Regional Study (NEU010)

Alexander Yang, Tunghai University

Fast fashion has become increasingly popular due to its affordability, accessibility, and ability to quickly follow current trends. However, the rapid production and consumption of clothing have also created significant environmental concerns, including textile waste, pollution, and increased carbon emissions. This study investigates public awareness of the environmental impacts of fast fashion and examines consumer purchasing behaviors through a questionnaire survey.

A total of 55 responses were collected, primarily from young adults aged 18-30. The results indicate that most participants are familiar with the concept of fast fashion and regularly purchase clothing, typically on a monthly basis or every few months. Although a majority of respondents acknowledged that fast fashion negatively affects the environment, many reported that they would continue purchasing fast fashion products in the future or were uncertain about changing their shopping habits.

The findings reveal a gap between environmental awareness and actual consumer behavior. Factors such as affordability, convenience, and accessibility continue to influence purchasing decisions despite growing sustainability concerns. This study suggests that reducing the environmental impact of fast fashion will require not only greater public awareness, but also more affordable sustainable alternatives and stronger encouragement toward responsible consumer behavior.

Bridging Scarcity and Sustainability: Copper and Cobalt Recovery Strategies in the Semiconductor Industry (NEU011)

Stefanie Yang, Tunghai University

Copper and cobalt are indispensable for many modern technological advancements due to their unique properties, such as transmission, power system, semiconductor and various clean energy technologies. Both metals are facing increasing global demand, supply chain vulnerability, and impending shortage. In semiconductor manufacturing, copper and cobalt are widely used in processes, such as chemical-mechanical planarization, wet etch, and electroplating, resulting in the generation of chemically complex, metal laden wastewater. Treatment for wastewater to meet stringent discharge standards is essential to protect environmental and public health. Conventional treatment strategies, primarily driven by compliance, follows a linear economy model, treating

valuable metals as pollutants for disposal rather as resource for recovery. This approach is increasingly regarded as unsustainable, given the critical need to conserve scarce resource and minimize waste. This review provides comparative assessment of copper and cobalt recovery technologies, and their environmental and economic benefits. By examining innovative recovery pathways, this review highlights how transition from pollutant removal to resource recovery can advance sustainability and enhance resilience of the semiconductor industry.

Production of Glucosyltransferase (GOOX) Using *Pichia pastoris* and Its Applications in Sustainability (NEU012)

Zhaoxi Zeng, Tunghai University

Glucosyltransferase (GOOX) is an emerging biocatalyst of interest in sustainable biotechnology due to its ability to oxidize oligosaccharides while generating hydrogen peroxide, a versatile and environmentally benign oxidizing agent. As industries seek to transition from conventional chemical processes to greener alternatives, this study aims to investigate the heterologous production of GOOX using *Pichia pastoris* and to evaluate its potential applications in biomass valorization. The gene encoding GOOX was expressed in *Pichia pastoris*, a well-established eukaryotic expression system known for high protein yield and post-translational modification capability. Recombinant strains were cultivated under controlled conditions, and the secreted enzyme was assessed for its activity and stability. The results indicate that *Pichia pastoris* can efficiently produce active GOOX with characteristics suitable for industrial applications. Notably, the enzyme demonstrates potential in biomass valorization by facilitating the modification and conversion of carbohydrate-rich substrates derived from agricultural residues, thereby enhancing their value and usability. In addition, its function as a biocatalyst supports environmentally friendly oxidation processes, reducing reliance on harsh chemicals and energy-intensive methods. These properties highlight its relevance within the framework of green chemistry and sustainable biotechnological practices. In conclusion, the successful expression of GOOX in *Pichia pastoris* and its functional performance underscore its promise as a versatile biocatalyst, particularly in advancing sustainable biomass utilization and contributing to the development of greener industrial processes.

Power-to-Gas: Converting Excess Renewable Energy into Green Hydrogen (NEU013)

Truong Phuc Vinh, National Sun Yat-Sen University & Willy Aelredus Irianto, National Sun Yat-Sen University

High penetration of solar photovoltaic (PV) and wind generation is essential for the clean energy transition, but their variable output can create periods of excess generation when production

exceeds local demand, grid export limits, or network capacity. In many systems, this surplus energy is curtailed, reducing renewable-energy utilization and weakening the economic value of clean generation. This poster presents a power-to-gas approach in which an electrolyzer is operated as a flexible controllable load to absorb excess renewable electricity and convert it into green hydrogen. The proposed concept focuses only on the electricity-to-hydrogen process. When PV and wind output is higher than the required electrical demand, the electrolyzer increases its power consumption and produces hydrogen through water electrolysis. When renewable generation decreases or the grid requires lower demand, the electrolyzer reduces its operating power. In this way, the electrolyzer provides demand-side flexibility while producing a useful energy carrier for industrial or storage applications. The advantage of this approach is that excess renewable electricity is not treated as wasted energy. Instead, it is transformed into hydrogen gas, supporting renewable curtailment reduction and better utilization of PV and wind resources. Therefore, power-to-gas offers a practical solution to integrate higher shares of renewable energy while expanding the production of low-carbon hydrogen, which still represents less than 1% of global hydrogen production.

Chitosan-Coconut Husk Based Dried Hydrogel for Phosphorus Adsorption (NEU014)

Chrysant Hasim, Tunghai University

Runoff from chemical fertilizers contributes to groundwater contamination and harmful algae blooms, damaging aquatic ecosystems. This study investigates chitosan–coconut husk powder (CHu)-based dried hydrogels as a sustainable material for phosphorus capture in agricultural runoff pathways.

Three hydrogel formulations (2% CHu, 5% CHu, and 2% CHu + CaCl₂) were synthesized and compared with a chitosan–nanoclay–iron (CH/NC/Fe) reference hydrogel. The hydrogels were evaluated for water adsorption and phosphorus adsorption capacity using a standardized 24-hour batch test at wastewater-relevant phosphorus concentrations (10 mg P L⁻¹).

Results showed that the hydrogels could adsorb up to five times their weight in water and retain it for a prolonged amount of time. Among the tested formulations, the 2% CHu hydrogel demonstrated the best phosphorus adsorption performance ($R_d = 7.252 \pm 0.149 \text{ L g}^{-1}$). Although the addition of coconut husk did not significantly improve phosphorus adsorption, it enhanced the structural stability of the dried hydrogels.

These findings suggest that coconut husk can serve as a biodegradable structural filler in chitosan-based hydrogels, with further studies required to understand its properties better.

Evaluating Bamboo Biochar as a Sustainable Soil Amendment (NEU015)

Nichole Huang, Tunghai University

The overuse of chemical fertilizers has led to soil degradation, nutrient imbalances, and environmental pollution, raising concerns about the sustainability of modern agriculture. This study investigates bamboo biochar—a carbon-rich material produced through pyrolysis—as a potential sustainable alternative for improving soil health and crop performance. Bamboo is a fast-growing and renewable resource with excellent properties such as high porosity, high silica content, and high carbon composition, making it particularly suitable for biochar production and long-term carbon sequestration.

A greenhouse experiment was conducted using four treatments: control, chemical fertilizer, bamboo biochar, and a combined treatment of bamboo biochar and chemical fertilizer. Romaine lettuce and potato were selected as model crops to represent short- and long-term soil responses. Soil parameters, including pH, nutrient availability, moisture, and temperature, were monitored regularly, and crop performance was evaluated through germination rate, plant height and biomass yield.

Initial observations suggest that bamboo biochar may support soil fertility and plant growth compared to untreated soil. Further statistical analysis will be conducted to assess its effectiveness in reducing reliance on chemical fertilizers and improving crop productivity. By providing experimental evidence on the agronomic and environmental benefits of bamboo biochar, this study aims to contribute practical insights into sustainable soil management strategies, offering localized, low-carbon solutions for farmers in bamboo-rich regions such as Taiwan.

From Light to Fuel: Li/Na and N/CQD co-doped BiVO₄ as a Game-Changer for Artificial Photosynthesis (NEU016)

David Hsu, Tunghai University

BiVO₄ (bismuth vanadate) is a promising semiconductor photocatalyst because it absorbs visible light well, which makes it useful for photoelectrochemical (PEC) water splitting and hydrogen production. Its band gap is around 2.4 eV, so it can use a large part of the visible light spectrum. A lot of past research has focused on transition-metal doping to improve BiVO₄ performance, but alkali-metal doping has been studied much less.

Alkali metals may be a simpler and more cost-effective way to improve BiVO₄. For example, lithium is relatively abundant and cheaper than many transition metals. Li doping can increase charge carriers and improve charge transport by changing the electronic structure of BiVO₄, which may help overall PEC efficiency. Sodium doping may have similar benefits, and combining dopants could further improve performance.

In this project, I used a straightforward hydrothermal method and easy-to-get materials to synthesize BiVO₄ and several doped versions. I have compared pure BiVO₄ with 1%, 3%, and 5% Li-doped BiVO₄ and Na-doped BiVO₄. The samples will be characterized using XRD, photoresponse, and transmittance measurements to understand how doping changes the crystal structure, morphology, and electrochemical behavior.

The results showed that all samples retained the monoclinic scheelite phase, indicating that alkali-metal dopants incorporation did not change the crystal structure. However, Na doping at 5 mol%, produced stronger structural and smaller crystallite than Li doping. Optical measurements further revealed enhanced visible-light absorption for all doped samples compared with the baseline BiVO₄, with Na-doped BiVO₄ showing the strongest absorbance across the visible range. In the conditions, a 0.6 mL stock concentration provided the best balance between signal quality and spectral stability. Preliminary characterization also confirmed successful synthesis of N/CQDs, although these were not yet integrated into BiVO₄.

The Impact of Air Quality on Athlete's Sports Performance (NEU017)

Ryan Yang, Tunghai University

Air pollution is now a global health problem and is known as a significant environmental factor affecting respiratory and cardiovascular function and athletic performance. During exercise, due to a substantial increase in ventilation, athletes ingest far more pollutants than the average person. In athletes, these mechanisms may lead to transient reductions in pulmonary function, bronchial hyperresponsiveness, decreased maximum oxygen uptake (VO₂max), and impaired exercise performance.

Arts & Humanities

High School

Youth Empowerment and Culture: Introducing the Taiwan-Philippines Youth Writing Exchange Program (AHH001)

Stacy Valerie Bucol, Shi-Yuan Senior High School

This poster presents the Taiwan-Philippines Youth Writing Exchange Program, a 3-week cultural project that connects both Taiwanese and Filipino youth through writing. The poster reflects on my own experiences as an exchange student in Shi-Yuan Senior High School and how living in Taiwan as well as how this project has increased my awareness on the importance of cross-cultural connection especially among young people.

The Tug-of-War in Mental Health Care Protection or Harm? — The Right of Taiwanese Adolescents to Autonomy in Mental Health Care (AHH002)

Annabelle Lin, Taoyuan Municipal Wu-Ling Senior High School

This study explores the conflict between institutional regulations and cultural realities surrounding adolescents' autonomy in mental healthcare in Taiwan. As mental health issues and delayed treatment among Taiwanese adolescents continue to rise, minors seeking psychological or psychiatric assistance still face barriers such as parental consent requirements, limited privacy, and social stigma. This research examines how East Asian cultural factors, including family authority, academic pressure, and the stigmatization of mental illness, influence adolescents' willingness to seek help. It also analyzes the legislative intentions behind Taiwan's mental healthcare policies for minors and investigates whether excessive parental involvement may unintentionally restrict adolescents' medical autonomy. Furthermore, the study compares Taiwan's system with those of other countries and discusses possible reforms that could better balance the protection of minors with respect for individual autonomy.

University

Beyond the Shell: Re-grounding Liberal Arts for 21st Century Global Citizenship (AHU001)

Pao-Hsiang Kuo, Tunghai University

The contemporary university faces a "crisis of essence," where the Liberal Arts tradition is increasingly reduced to a hollow administrative label—an "administrative shell" devoid of its transformative power. This conceptual erosion fragments curricula and weakens the cultivation of "Global Citizenship" in an era of global risks.

This poster proposes a regrounded conceptual framework designed for the 21st century. Rather than merely looking back at historical models, this presentation explores a hierarchical logic: "Learning Methodology → Knowledge Structure → Social Responsibility". By identifying the essential nexus between interdisciplinarity and moral responsibility, the proposed model seeks to resolve terminological confusion and offer a practice-oriented path for curriculum reform. Ultimately, this proposal asserts that liberal arts education is not an ornamental luxury, but a fundamental necessity for navigating the complexities of a globalized world.

A Norm-Referenced Study on The Quality and Perceptions Related To Multiple-Choice Questions in The 2025–2026 Grade 10 Entrance English Exam For 9th Graders in Thanh Hoa, Vietnam (AHU002)

Truong Diem Quynh, National Kaohsiung Normal University

This mixed-methods study evaluates the quality of Multiple-Choice Questions (MCQs) in the 2025-2026 Grade 10 English Entrance Exam in Thanh Hoa, Vietnam, while investigating teacher and student perceptions of difficulty. Analyzing 25 items from a high-stakes assessment administered to over 43,000 candidates, the research triangulates norm-referenced item analysis, expert validation, and thematic qualitative interviews to evaluate test validity.

Statistical analysis reveals a rigorous design: 52% (13 items) were Moderate (IF: 0.41–0.60) and 48% (12 items) were Difficult (IF: 0.21–0.40), with no easy items detected. Despite this, the test showed exceptional discriminative power, as 92% of items achieved a "Very Good" Discrimination index ($ID \geq 0.40$). Distractor Efficiency reached 96%, indicating high distractor plausibility. Furthermore, an Independent Samples t-test ($p = .047$) confirmed a significant gap in perceptions: Bottom-performing students ($M=3.02$) perceived the exam as much more challenging than the Top group ($M=2.47$).

Qualitatively, while teachers generally viewed the exam as curriculum-aligned, thematic analysis revealed critical pedagogical "bottlenecks." Significant hurdles were identified in phonetics, specifically word stress due to lexical category deficiency, and reading comprehension, which required complex contextual inference beyond isolated rules. These challenges induced psychological distress, characterized by avoidance behaviors like blind guessing and "stalling," particularly among rural learners with restricted lexical ranges. The study concludes that while the exam effectively establishes a performance hierarchy, its high cognitive demand poses affective barriers. Recommendations include adopting a 70/30 difficulty matrix, enhancing practical application items, and providing targeted teacher training to balance academic rigor with educational equity.

Y2K Typography: Between Reading and Seeing (AHU003)

Pei-Chen Wei, National University of Kaohsiung

In recent years, Y2K aesthetics have re-emerged in graphic design, particularly in typography. Characterized by distortion, decorative elements, and strong visual identity, Y2K typefaces are widely used across media such as posters, photography, and digital content. However, compared to modern sans-serif typefaces, they often exhibit lower readability.

This study investigates the relationship between stylistic intensity and readability, and examines how different typographic treatments influence reading behavior and visual perception. Three conditions were tested: high-intensity Y2K, low-intensity Y2K, and modern sans-serif. Participants read identical texts under each condition and were evaluated based on Reading Accuracy, Aesthetic Preference, Level of Interest, Reading Time, and Impression Strength.

The results show that as readability decreases, reading shifts from efficient information processing to a slower, more perceptual experience. While sans-serif typefaces enhance clarity and speed, Y2K typography introduces visual complexity that increases attention and strengthens visual memory.

This study suggests that readability should not be treated as the sole criterion in typography, but as a variable that can be strategically adjusted. By introducing friction into the reading process, designers can transform typography from a functional medium into an experiential one.

Kandinsky 160th Anniversary (AHU004)

Yeh Wei Huang, Southern Taiwan University of Science and Technology

Inspired by the expressionist master Wassily Kandinsky, this work commemorates the 160th anniversary of his birth. It seeks to pay tribute to his legacy through a personal lens and analytical perspective. Centered on the fundamental elements of "Point, Line, and Plane," the composition

deconstructs the master's classic aesthetic while subtly integrating the symbolic imagery of "160" within the visual structure to mark this significant milestone.

The Influence of Islamic Thought on Medieval Maths and Its Resonance in Modern Science (AHU005)

Cheyenne May Hellowell, Tunghai University

I open by discussing the significance of the house of wisdom, and how many Islamic requirements such as daily prayers, Qibla, Zakat. I want to explain that religion was the backbone that cultivated a society in which scientific advancement was rewarded. Religious requirements are what pushed Islamic scholars to join together and research the science of any culture they could find in pursuit of a single faith-related goal.

A split section in the middle detailing the influence of the three main cultures dissected and recorded by Islamic scholars being Greece, India, and Persia.

Greece's section will detail the rigorous translation of Greek story problems into universal formulas, core definitions of theoretic sciences and the concept of "nature" which differed, Randomness and irrational numbers treated in a new light.

India's section will detail the adoption of Hindu numerals, and how numbers 0-9 were decided upon to be a universal language. clash between Hindu and Islamic beliefs and the concept of "Bid'ah" which required many Indian texts to have mythological backings and cultural influences filtered out, created first version of secular sciences. first defined version of Algebraic techniques.

Many ancient cultures like the Babylonians were preserved within Persian writing but not deeper inspected until this scientific movement which allowed old texts to be brought into the new universal language, multicultural hub of the house of wisdom. Chinese influence on Muslims which brought paper technology, highlighting the importance of trade and foreign relations.

It's only through the uniformity and clarity of Islamic record keeping that foreign future cultures such as Europeans were able to quickly pick up the lessons and teach it amongst themselves, adding onto the discoveries and leading to modern sciences. This method of universal messaging is a core concept in Islam rooted in the preservation of the Quranic writing.

Danger Does Not Announce Itself: A Service Design Approach to Women's Self-Protection and Real-Time Support During Travel (AHU006)

Zi Chi Yang, Feng Chia University, Yi Fan Chen, Feng Chia University & Han Wen Chuang, Feng Chia University

This project addresses the pervasive issue of harassment faced by women in public spaces. Despite the high frequency of such incidents, many women remain silent due to fear, and existing market solutions often fail to provide effective, immediate assistance. SHiEld+ was developed to bridge this gap through service design, creating a reliable and intuitive support system for female self-defense.

Utilizing in-depth interviews and secondary research, the study identified two critical pain points: the lack of immediate on-site help and the need to de-escalate and exit threatening situations safely. By applying service design methodologies—including contextual inquiry, personas, and user journey mapping—the project defined its core mission: "How to enable solo female travelers to achieve safe and effective self-rescue when encountering strangers."

The resulting innovation, SHiEld+, is a comprehensive system integrating prevention, real-time response, and post-incident support. The solution features a digital interface with voice deterrence and route-warning capabilities, paired with a multi-functional physical device combining a power bank and pepper spray. Complemented by a psychological counseling referral service, SHiEld+ offers a holistic approach to personal safety. This research provides a new design paradigm for female empowerment and serves as a practical reference for future applications in personal security services.

Addiction and Moral Responsibility: Between Choice, Compulsion, and Psychological Vulnerability (AHU007)

Otgontsetseg Shinekhuu, Tunghai University

Addiction is often understood either as a personal choice or as a disease that removes self-control. This project examines the relationship between addiction and moral responsibility by exploring psychological, biological, and social explanations of addictive behavior. The research asks whether addicted individuals should be held morally responsible for their actions if addiction weakens their ability to make rational decisions.

This study analyzes competing perspectives in philosophy and addiction studies, including the brain disease model, psychological theories of vulnerability, and theories that emphasize personal choice and agency. By examining scholarly debates on autonomy, self-control, and responsibility, the project argues that addiction does not completely remove human agency, although it can significantly weaken decision-making capacity. Because individuals often retain some ability to resist or recover from addiction, moral responsibility should not be entirely removed. However, responsibility should also be understood within a broader social and psychological context that includes emotional vulnerability, family influence, and environmental factors.

The project contributes to ongoing discussions about ethics, free will, and human behavior by presenting addiction as a complex condition that exists between compulsion and choice rather than as a purely voluntary or purely involuntary phenomenon.