2020

THEi Student Applied Research Presentations SARP 2020

Research Office, Technological and Higher Education Institute of Hong Kong

STUDENT APPLIED RESEARCH PRESENTATIONS

2020

ABSTRACTS

Thei
Member of VTC Group
VTC 機構成員

Technological and Higher
Education Institute of Hong Kong
香港高等教育科技學院

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MESSAGE FROM THE PRESIDENT

Welcome to THEi Student Applied Research Presentations 2020.

In 2019, THEi successfully hosted the first Student Applied Research Poster Presentations, attended by both local and international delegates attending the International Applied Education, Technology and Innovation Conference held at THEi Chai Wan campus. This year, due to Covid-19, THEi student posters and abstracts in this e-book, as well as video presentations (optional) are being made available on the THEi website from 1 August 2020 for public viewing.

Poster presentations employ significant planning and involve our students in hands on problem solving, namely, designing and clearly communicating their findings related to a particular applied research question of interest. The task is to creatively design a poster that not only stimulates ready comprehension of the material by the viewer, but one that also acts as a conversation starter to prompt questions and discussion about the applied research project.

As a vocationally and professionally orientated degree-level institution, THEi, in tandem with our industry partners, actively nurtures project-based learning that develops the design thinking, problem-finding and solutions orientation of our programme cohorts. Fostering awareness and engagement with applied research is therefore a vital part of the learning journey of THEi students. It is indeed encouraging that forty-one students completing their Final Year Project (FYP) from across THEi Faculty of Science and Technology (FST), Faculty of Design and Environment (FDE), and Faculty of Management and Hospitality (FMH) have submitted their abstracts for this 2020 event. As you will observe, the applied research topics deploy various investigative methodologies, but all are very practically and authentically focused, and importantly, relevant to the needs of Hong Kong and its community. The key themes of the presentations are identified below, many also have broad generalizability as topical areas of investigation internationally.

Building Projects: Redevelopment, Rehabilitation and Energy Efficiency
Projects exploring the redevelopment and rehabilitation of buildings in Hong Kong (Surveying, FDE). For example, evaluating abandoned spaces in Hong Kong for redevelopment; converting vacant school premises into elderly residential care homes; exploring a co-living concept as a solution to the housing problem for the younger generation; and using BIM technology for building enhancements (Engineering, FST).

Development of New Food Products for Elderly People or for Health Reasons
Projects to develop healthy snacks for the elderly (Healthcare, FST), 3D printed foods (Food Science and Safety, FST), using plant-based ingredients to enhance the nutritional value and texture in food or new products for people with diabetes. Other projects evaluate probiotics in food products. Unrelated to product development, but related to health care and for the elderly, one project (Product Design, FDE) investigates health services and products for the elderly.

Sustainability and the Environment
Projects on environmentally friendly food packaging for food takeaway services (Product Design, FDE), tackling shore pollution (Landscape Architecture, FDE); developing a wearable air quality detector (ICT, FDE). Other projects (Engineering, FST) investigate background light (pollution) from neighbouring residences; analyse coastal flooding and design flood maps for Hong Kong, investigate the feasibility of installing free cooling systems for office buildings; explore the use of eco bricks for paving; and use AI for a green roof maintenance system.

Hotel Management
Two projects (Culinary Arts and Management, FMH) investigate topics on retaining hotel employees through organisational and occupational commitment.

Congratulations to THEi students on completing your applied research projects and poster presentations. Your interest in continuing to develop your professional skill sets as you have analysed, summarised, synthesised, edited, designed, presented and enhanced your communication abilities through the sharing of your work is to be highly commended!

Prof Christina Hong, PhD
President THEi
August 2020

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Poster available. Click on the icon to view poster.

Organized by the Research Support Centre & Research Office

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FACULTY OF DESIGN AND ENVIRONMENT

Department of Design

A GAMING APPLICATION FOR PROMOTING CANTONESE

SIU Ho Kai
BA (Hons) in Advertising
Faculty of Design and Environment

ABSTRACT

RESEARCH BACKGROUND

With societal developments and government policies, Putonghua has been used to teach Chinese in Hong Kong in recent years, students are using less Cantonese, and people are worried that it will slowly vanish. To promote and help people use Cantonese, this project proposes to motivate people for using more Cantonese and get people interested in the language.

Objectives

The main purpose of this study is to explore the sustainability of the Cantonese language and find out why Cantonese is slowly dying in Hong Kong. It also aims to discover new ways and opportunities to promote Cantonese in Hong Kong, to bring popularity and awareness to Hong Kong people.

METHODOLOGY

Data will be collected using questionnaires and semi-structured interview techniques. Six students will be participating in this study, and they will be asked questions on what they think about Cantonese in Hong Kong and what it means to them.

EXPECTED FINDINGS

It is anticipated that a gaming application will be created for promoting Cantonese. It aims to create interest and awareness of Cantonese for Hong Kong people and let people have a deeper insight about the Cantonese language.

About the Investigator

I am Smile Siu. My interests in design and gaming inspire me to do this project. Mr Raptor Kwok, my supervisor, gave me a chance and some helpful advice at the start of the project. I hope I can use my design and idea to inspire and help others, but also make people feel entertained whenever they see my design. Therefore, I will spend my time to study different design and techniques when I have time. I want to have a career in a design area after graduation.

AN INVESTIGATION ON THE RELATIONSHIP BETWEEN COLOUR FORECASTING AND ITS IMPACT ON HONG KONG'S FASHION YOUTH MARKET

LAU Ho Ting
BA (Hons) in Fashion Design
Faculty of Design and Environment

Objectives

The main purposes of the study are to investigate the performance of colour forecasting in Hong Kong's fashion industry and study the impact of colour forecasting in Hong Kong's fashion youth market, to identify the potential of the market and the importance of colour forecasting.

ABSTRACT

RESEARCH BACKGROUND

Colour forecasting has a significant role in the fashion business. However, studies on colour forecasting, especially based on the Hong Kong market, are limited. In the past, Hong Kong people showed a lack of interest in colour. Nowadays, the younger generation is more creative and open to styling, and Hong Kong's youth market is showing the potential that the application of colour forecasting is needed. For most people, it is hard to understand the forecasting methods from major forecasting organizations, so instead, they simply follow the trend. This research seeks to investigate colour forecasting methods and its application in Hong Kong's fashion industry.

METHODOLOGY

Data will involve interviewing people in different positions in the fashion industry, including trend specialists in WGSN Hong Kong, designers of local fashion brands, editors, influencers, stylists, and salesperson and consumers. The interview questions are aimed to lead the interviewees to think and explain how colour forecasting applies in the Hong Kong fashion market and youth market, and how colour forecasts and trends affect them and young consumers.

FINDINGS

The potential of Hong Kong's youth market for colour forecasting, and the application of colour forecast in Hong Kong's fashion industry is low and underrated. Young consumers in Hong Kong show strong interests in fashion and trends and have expectations for colour.

About the Investigator

I am Serene Lau. As a colour lover, it is a dream of mine to see more people embrace colour in fashion in Hong Kong. My supervisor, Dr Chan Man Hin Eve, has been giving me guidance and valuable advice throughout my preparation of the project. As a fashion student, my interest and curiosity for trends have questioned the accuracy and forecasting methods of colour trends. It has inspired me in doing this study, and it has given me the idea of becoming a trend forecaster myself in the future.

AN EXPLORATORY STUDY ON THE PREVENTIVE MEASURES TO AVOID THE EXPLOITATION OF CHILD LABOUR IN THE BELT AND ROAD COUNTRIES FROM THE FASHION INDUSTRY'S PERSPECTIVE

MULLICK Ikra
BA (Hons) in Fashion Design
Faculty of Design and Environment

ABSTRACT

RESEARCH QUESTIONS

1. Why is it still common for manufacturers to hire children even after knowing the consequences?
2. Why do the measures taken to prevent child labour still fail to resolve the issue?
3. What is the impact of child labour on the local economy?
4. How do business opportunities, for instance in the Belt and Road Initiative, influence the issues of child labour?

Objectives

The main purpose of the research is:

- To help support developing countries thrive
- To find effective measures we can take as individuals
- To provide realistic methods to deal with the issue of child labour
- To assist as a guide to a fruitful Belt and Road Initiative

METHODOLOGY

The interview includes 10 interviewees from the education sector and from the fashion industry.

FINDINGS

Most people who knows about the issues of child labour know it is not regulated, and that children are highly vulnerable to being exploited. Despite that, the findings show respondents in the education sector, and some from the fashion industry, view the industry's practice of child labour is inhuman and wrong. Some respondents argue that many times, the children do not have a choice to not work because of the lack of financial aid in the family. Working may be the only way to support the livelihood of the family. Therefore, this can be one of the biggest restraints on the policies taken to prevent the issue. One way in which policies can prevent the practice of child labour is to have campaigns and schemes that support the livelihood of children and their family in need, and their education.

About the Investigator

Hello! My name is Ikra Mullick. I'm a final year student who enjoys reading books and taking creative photography. My supervisor, Dr Chan Man Hin, Eve, has always been supportive of my ideas and pushed me to my full potential. I do hope that the fashion industry takes a proper approach to deal with the ethical issues that still prevail. My career goal is to be part of that change and bring in a new era of smart consumerism to society.

THE APPLICATION OF MULTI-FUNCTIONAL DESIGN IN ACCESSORIES

LI Nok Yu
BA (Hons) in Product Design
Faculty of Design and Environment

ABSTRACT

RESEARCH BACKGROUND

Accessories have become common decorative ornaments in the development of human society. However, in the past, accessories or jewelry were generally regarded as multi-functional items rather than just being decorative. Accessories that originated purely as functional items have evolved into decorative items, as their functional requirements have diminished in present-day society. Regarding the rising trends of multi-functional design, people are now considerably approbating the value of add-on functions on a product. Due to large design potentials on existing products, more product value can be added to ordinary one-function-accessories. With multi-functional designs raising the demand for multi-purpose accessories, they can help users solve daily problems and provide better wearable experiences.

Objectives

The purpose of the project is to understand the design elements of accessory design in modern-day society, combining multi-functional designs, and raising product value of wearable accessories to enhance user experiences.

METHODOLOGY

Both qualitative and quantitative research methodologies will be used in this study to generate insights on user preferences and identify underlying problems and opinions towards wearable accessories. Questionnaires will be conducted which focuses on user habits, preferences, and problems; and in-depth interviews will allow the collection of deeper and more comprehensive opinions about the accessories market.

EXPECTED FINDINGS

The research would help identify and understand user preferences in accessory design in the current market. Exploring the relationships between product functionality and accessory design can find out the product opportunity gap in the current accessory market. This can propose future design directions aimed to enhance the user experience of wearing accessories.

About the Investigator

I am Cherry Li, my major is in Product Design, and I am interested in jewelry design. I want to make contributions to the industry by revamping it with inputs on practical functionality from the angle of product design. My supervisor, Mr Sonny Choy, has guided me along the path of design by giving thoughtful insights. I hope the project can be inspiring and help improve the experience of wearing jewelry under his supervision.

HONG KONG'S HEALTHCARE PRODUCTS AND PHYSICAL HEALTH PROTECTION FOR MIDDLE-AGED PEOPLE

TSE Tin Ki Peter
BA (Hons) in Product Design
Faculty of Design and Environment

Objectives

The objectives of the study are to communicate with the largest age group of Hong Kong's population, who are also the most forgotten ones in society. The aim is to conduct interviews to discuss the current healthcare system, as well as, to understand their demands and needs towards the local healthcare market in Hong Kong.

ABSTRACT

RESEARCH BACKGROUND

Due to limited living space, as well as the quick and busy environment of Hong Kong, many middle-aged people do not live a healthy lifestyle, and some suffer from illnesses or other health conditions. Apart from that, only a small number of people, including those who suffer from chronic illnesses, have easy access to healthcare products.

METHODOLOGY

Online interviews were used during the research due to the limitation of face-to-face interviews, as a result of the outbreak of the COVID-19 pandemic. Qualitative data collected from conversations with the interviewees were analyzed to discover the actual problems in the current existing healthcare system, as well as the expectations of the users for a good healthcare product that would benefit their life.

FINDINGS

Despite well-developed transportation, which provides good accessibility to the service, many of the middle-aged interviewees believed that the cost of the healthcare service is expensive with limited manpower support. In terms of the local medical healthcare market, most of the respondents suggested that convenience and fitting personal needs are the main factors of a good healthcare product.

About the Investigator

I am an enthusiast design student who loves artistic creation as well as reading books and references related to history and technologies. I am also a keen volunteer who participated in numerous voluntary programs and activities. I aim to contribute to society with a functional, advanced technological but user-friendly product, which allows more and more people in need to become the most benefited under my product design. The project above is under the supervision of Mr. Lee Kwok Lang.

ECO DELIVERY EXPERIENCE

WONG Hoi Ying
BA (Hons) in Product Design
Faculty of Design and Environment

ABSTRACT

RESEARCH BACKGROUND

With the rise in takeaway services and popularity of Japanese cuisine, one concern is how to keep the food fresh but also protect our environment by using less single-use containers. By finding out the causes and effects of using non-reusable containers and designing a set of sustainable design principles for food containers used in takeaway services, the project aims to inspire a green life to the public.

Objectives

The purpose is to optimize the use of takeaway services for Japanese cuisine restaurants and find out existing negative features and improve these to become environmental. To accomplish the goal, several objectives are set:

- To research on Hong Kong's Japanese takeaway services to design a set of food containers which can improve the service,
- To find out how to use, and the difficulties in using takeaway services for Japanese cuisine,
- To find out the pros and cons of reusable food containers,
- To find out how to design food containers to promote sustainable living for dieting.

METHODOLOGY

By using qualitative methods, interviews with different stakeholders will be conducted, including the boss of a Japanese cuisine store, the deliveryman, and the customers. The aim is to understand the needs and real situation of each stakeholder to design suitable food containers. Moreover, existing food containers in the market will be analyzed to figure out the pros of different products in order to inspire a better idea.

EXPECTED FINDINGS

There is the potential of developing a longer life cycle takeaway container to protect the environment.

About the Investigator

I am Edith, Wong Hoi Ying, a Year 4 Product Design student. I regularly like to listen to music and enjoy the melody and lyrics. I also like to go out and discover interesting products that I have never seen before. For my FYP, I wanted to do more to improve takeaway services by examining the use of sustainable products with the guide and help from my supervisor, Mr Henry Yu. In the future, I would like to engage in companies that care about environmental issues.

INTERACTION IN HIKING BETWEEN CHILDREN, PARENTS, AND ECOLOGY

WONG Wing Sze
BA (Hons) in Product Design
Faculty of Design and Environment

Objectives

The research seeks to clarify the current situation on family hiking. The project aims to understand the intentions, and design a solution to improve existing facilities to add interactions, which can enhance relationships and raise awareness on ecological balance, thus increasing long-term hiker satisfaction and sustainability.

ABSTRACT

RESEARCH BACKGROUND

Family hiking is an emerging trend where parents and children can spend valuable family time together and interact with nature. Visitor Centers are built to support ecological education. However, low popularity and temporary education outcomes causes unsustainability and resource loss. More hikers tend to rely on the internet and Apps when faced with any ecological issues. Therefore, is operating an app more sustainable and effective in educating ecological issues? And how can a Visitor Centre be improved to achieve sustainability?

METHODOLOGY

First, field visits will be conducted to study the ecological environment and identify existing supports and trail conditions. Second, to conduct surveys and interviews to understand social phenomena, hiker intention, satisfaction, and experience. Participated observations will also be used to investigate user actions and patterns to analyze hikers' attitudes. Lastly, to develop a mock application to test the difference in operating the supportive mobile facilities and a visitor center, and examine how to keep the balance between the two to gain ultimate interactions and achieve sustainability.

EXPECTED FINDINGS

Comparing geology, ecological characteristics, and human factors, e.g., intentions and continuous interest, having mobile facilities are more sustainable than a normal Visitor Center. Visitor Centers should provide a gadget for hikers to carry or wear that will guide and tackle the issues they might face along their hike. At the same time, existing signs should be upgraded.

About the Investigator

I am Cecilia. Under the supervision of Mr. Henry Yu, I am researching the relationship between family hikers and ecology. The investigation was inspired by my actual hiking experiences, which I discovered family hiking holds different attitudes and requires more preparation than normal hiking. Family hikers focus more on inter-personal relationships and outdoor education. Throwback to my childhood, I have fewer experiences in outdoor activities, so I am grateful that I could return to nature and experiment with new things, especially hiking with a group of friends. When I grow up, I would like to become a designer and an educator that links kids and wildlife together.

FACULTY OF DESIGN AND ENVIRONMENT

Department of Environment

EXPERIENCE SHORE LIFE - A DESIGN PROPOSAL TO IMPROVE THE EXISTING ROCKY SHORE SITUATION OF DOMESTIC WASTE PROBLEM AND DISCOVER THE MYSTERY SEASIDE IN HONG KONG

KWOK Hiu Yan Elly
BA (Hons) in Landscape Architecture
Faculty of Design and Environment

ABSTRACT

RESEARCH BACKGROUND

Ocean waste is a serious global problem. Over millions of tons of waste are disposed to the ocean and impacting the marine ecosystem every year (Ocean Park, 2019). This project focuses on rocky shores because it has a high ecological value and always holds floating waste. This study evaluates the ecological value of rocky shores and how the waste problem influences the shore. The study will outline a design proposal to improve the problem.

Objectives

This study aims to know the situation of rocky shore to inspire ecological awareness and sustainable use of marine resources. Research on Tai Shue Wan rocky shore will be reviewed to make a recommendation to improve the ocean waste problem.

METHODOLOGY

A combination of desk research, literature review, and site research is conducted. Data will be collected by sending questionnaires to 30 hikers to ask about seashore tourism. Interviews with 10 fishermen to ask about the biology of the site and their opinion from a tourism point of view will also be conducted.

FINDINGS

A design proposal with three concepts (zones) combines shoreline tourism activity, art, and dining to inspire ecological awareness. It includes: i) Waste situation cognize zone - observe how waste affects shore life; ii) Energy adventure zone – through playing water sports to cherish the ocean; and iii) Aqua garden zone – appreciate amazing sea life to compare the waste situation cognize zone to introspect effect of waste. The result summarizes the findings of how domestic waste influences rocky shores, and a design proposal for Tai Shue Wan to solve the problem is identified.

About the Investigator

I am Kwok Hiu Yan, Elly. I like reading and outdoor activities to observe wild ecology and feel the natural environment. Mr Michael Thomas is my tutor for the project. He has guided me to create an interesting design proposal. I hope I can work in the landscape and design industry after graduation to create a more healthy and interesting space to improve citizen's quality of life.

THE ENVIRONMENT IN ABANDONED SPACES UNDER BIOPHILIC DESIGN

WU Chor Yiu
BA (Hons) in Landscape Architecture
Faculty of Design and Environment

ABSTRACT

RESEARCH BACKGROUND

This study investigates and evaluates the environmental potential and limitations in Hong Kong's abandoned spaces under biophilic design patterns and practices.

Objectives

Preservation in Hong Kong, particularly environmental preservation and architectural preservation, shows that redevelopment projects place a higher value on building structure than its surrounding environment. This overlooks the benefits of the environment, leading to a lack of interaction between humans and the environment. Is there a way to preserve the beauty of abandoned spaces and fulfil the needs of redevelopment?

METHODOLOGY

The methodologies used in the study include literature and lecture reviews, laptop research, site investigation, site visit and case studies. Through studying the literature, the pattern and practices of biophilic design are well designed overseas but rarely applies to Hong Kong's abandoned space development. Through site investigation of 104 abandoned sites in Hong Kong, the major types and characteristics of Hong Kong's abandoned sites were found. The study compared, matched and analyzed the similarity of those characteristics and the practices of biophilic design.

EXPECTED FINDINGS

The results show that there is a huge potential for abandoned spaces to carry out biophilic designs. The characteristics of Hong Kong's abandoned sites will be scored by how they can achieve a biophilic design (quality and quantity). These characteristics create opportunities for achieving biophilic designs. A further design should be raised to achieve the purpose of biophilic designs, e.g. the connection between humans and nature.

About the Investigator

I want to be a landscape architect who treats public goods and the needs of the natural environment as equals. Landscape designs are not just beautiful sceneries that only heal the public (by protecting their culture and reconnect communities), but they also take care of the natural environment and habitats. All living things should be respected. I think landscape architects will play an important role in the world's upcoming challenges, such as global warming.

Supervisor: Mr Michael Thomas

AN EVALUATION OF SCAN-TO-BIM APPROACH FOR QUANTITY TAKE-OFF

LUK Yu Yan
BSc (Hons) in Surveying
Faculty of Design and Environment

Objectives

This study aims to justify the applicability and efficiency of adopting BIM-and-TLS-based measurement techniques over prevailing market practices in urban rehabilitation projects in Hong Kong to help make progress in building rehabilitation.

ABSTRACT

RESEARCH BACKGROUND

Being perceived as a prosperous and highly modernised city by many, Hong Kong's detrimental problem of ageing buildings is often overlooked. The Building Department launched the Mandatory Building Inspection Scheme in 2012, which has since initiated a substantial number of rehabilitation and renovation projects. Nonetheless, disputes in these maintenance projects arise precipitously because of the lack of transparency in the cost of some maintenance contracts, which loads outrageous maintenance cost onto the owners' shoulders.

5D Building Information Modelling (BIM) is one of the most efficient ways to increase the transparency on the cost, due to its automated measurement of taking-off quantities. Terrestrial Laser Scanning (TLS) always goes hand in hand with BIM and 5D BIM in existing building projects to generate models, given that most of the old buildings did not have BIM models. It paves the way for this study to explore the potentials and barriers to apply BIM and TLS in private housing maintenance and rehabilitation.

METHODOLOGY

The methodological approach will be a qualitative comparative study with the support of empirical data. Works of literature were reviewed to identify the research gap and the study proposal. A series of quantification comparisons will be used to examine the level of accuracy, resource input and operating efficiency of TLS & BIM over traditional measurement practices. Both methods will be applied to the same study target: two 7-storey tenements on 37-39 Kai Ming Street in To Kwa Wan.

EXPECTED FINDINGS

The speed and precision of TLS & BIM is likely to be higher than traditional measurements. For the cost, it might be hard to isolate the cost-saving/ proliferation for a particular player and period of time, because BIM is a collaborative framework that benefits one another whenever resources are invested.

About the Investigator

My name is Sophie Luk. I am studying Surveying in THEi. My career goal is to be a chartered professional quantity surveyor and ultimately a professor in the subject. My supervisor is Sr Ir Dr Ken CHAN. I give my heartfelt thanks for his support and provision of resources and practical knowledge.

A STUDY ON THE POTENTIAL OF CONVERTING VACANT SCHOOL PREMISES INTO ELDERLY RESIDENTIAL CARE HOMES

NG Mei Hae
BSc (Hons) in Surveying
Faculty of Design and Environment

Objectives

1) To identify the current situation of vacant school premises and the elderly care home service in Hong Kong.
2) To identify the potential value of converting vacant school premises into elderly homes.
3) To provide suggestions for converting vacant schools in Hong Kong.

ABSTRACT

RESEARCH BACKGROUND

The aging population is a worldwide phenomenon that will bring negative consequences to society and economic development. Hong Kong's increasing number of elderlies, along with shortages of elderly services means that the provision of elderly care homes is important. Land resource in Hong Kong is scarce therefore creating difficulties for provision. However, the government has announced to review vacant school premises and convert them into elderly care home services. This study seeks to investigate the conversion of vacant school premises into elderly care homes.

METHODOLOGY

Research methods including a literature review, case study, and supplementary interviews were used to identify the conditions of vacant school premises for conversion. The literature review helps to establish the study structure, and a case study was adopted in the second stage to study the differences between different construction methods of having elderly care homes, to evaluate the potential of vacant school premises. Lastly, interviews were introduced for supplementary purposes.

FINDINGS

Based on the results, it is concluded that the conversion of vacant school premises is legally, technically, financially, and environmental-beneficial. The conversion of vacant school premises to an elderly care home is a potential alternative. Suggestions for enhancing the current situation of vacant school premises and future studies were also identified.

About the Investigator

I am May Ng. My interests in reading and drawing inspired me to study Surveying. Sr Lawrence Tse, my supervisor, gave me useful advice during the project process. I want to be a Building Surveyor in the future, who can practice different building regulations and solve different types of building problems to provide a safe living environment for people.

ANALYSING THE IMPORTANCE OF CO-LIVING IN ALLEVIATING THE HOUSING PROBLEM FOR YOUTHS IN HONG KONG

YEUNG Sin Yee
BSc (Hons) in Surveying
Faculty of Design and Environment

Objectives

The research aims to explore teenagers' views and acceptance of the co-living model. Also, the study aims to identify the housing preferences of co-living among young people and provide project suggestions on the further development of co-living spaces.

ABSTRACT

RESEARCH BACKGROUND

Over the past decade, Hong Kong´s residential property prices have soared. In contrast, real income has virtually stagnated in Hong Kong for years. Thus, the high-rising housing prices have sparked a huge concern in society. A survey found that 70% of people aged 18 to 30 are worried about the housing problem. Recently, some private sectors have started to promote co-living apartments. The co-living model is gradually getting more attention as it seems to provide a new housing option for the younger generation in Hong Kong.

METHODOLOGY

In this research, interviews and a questionnaire survey were carried out between 16-30th March 2020. The number of total collected responses for the questionnaire was 116, and two interviewees participated in the interview.

FINDINGS

After intergrading the data, it is found that although different groups of teens express different views on the liveability and affordability of co-living, the overall acceptance of co-living space is high. Moreover, this research points out that, "Design & Area of Private Living Spaces", "Co-living Flatmate / Roommate", "Rental Price" and "Security" have the highest scores among eight living requirements for co-living spaces from Hong Kong youth. These results can provide an indicator to the government to develop a new housing option and policy for the youth in Hong Kong.

About the Investigator

I am Yeung Sin Yee. A final year student. I will graduate from the Bachelor of Science in Surveying programme in June 2020. My career goal is to be a successful surveyor. My FYP supervisor is Sr Lawrence TSE.

FACULTY OF DESIGN AND ENVIRONMENT

Innovative and Information Technology Programmes

ARTIFICIAL INTELLIGENCE WITH LIVE SOUND AND STAGE PRODUCTION

CHEUNG Yuk Wah
BSc (Hons) in Information and Communications Technology
Faculty of Design and Environment

Objectives

The study aims to design an application to enable automatic live sound and stage production to reduce human manpower. The application can be used in Drama performances, live band shows, culture dances and so forth.

ABSTRACT

RESEARCH BACKGROUND

Nowadays, Artificial Intelligence (AI) is popular and most companies and organizations use them for big data analysis and object detection to help them accomplish jobs. Most stage productions need to have a technical design, but it would take a lot of time to produce the stage show. Also, if the invited performer is a student, organizing the rehearsal time may become difficult since the students may have a lot of homework. On the other hand, for people who need to go to work, it may be hard to choose a rehearsal date and income for the drama production may be lost. This project seeks to build an application to reduce the manpower for a sound mixing engineer. The project would require many audio devices/interface to test the application.

METHODOLOGY

The proposed method is to firstly build a simple interface for a remote control and the java application for mixing. Secondly, the sockets will be connected together and this part may need to spend more time. Then, more parameters for audio adjustment needs to be identified. Next, is to conduct an audio analysis for the suitable attributes. After that, a built in IO will be used to test the audio connection and apps interactivity. If the test is successful, an audio IO would be used to test the system.

FINDINGS

This project hopes to accomplish an integrated stage production system. It will be used for drama, opera, and live band shows. The action plan includes the interface design, code implementation, interface testing, socket programming, sound testing, and cue testing.

About the Investigator

Hi, my name is CHEUNG Yuk Wah. I like to use computers to search for information, make videos, audios, programming for games, and other useful things that will benefit other people. I was diagnosed with Autism, but IT is my strength. My career goal is to be a programmer to work with a government organization or a major company. My supervisor is Dr Aileen Hou.

DEVELOPING A SMART WEARABLE AIR DETECTOR

YIU Chun Kit Alex
BSc (Hons) in Information and Communications Technology
Faculty of Design and Environment

ABSTRACT

RESEARCH BACKGROUND

Air quality is a problem in Hong Kong. Although the Government publishes daily air quality data for various districts, i.e., the Air Quality Health Index (AQHI), the data cannot tell the accurate air quality surrounding a person. Body-area air-quality detection has not been seen in Hong Kong's wearable device market, but it has recently begun to draw increasing attention from the local society due to special situations. In this project, we aim to develop a wearable device for real-time body-area air-quality detection.

Objectives

The wearable device is expected to collect real-time air data, especially for harmful gases, and display the data on a mobile phone for analysis. It is aimed to support not only instant air data reading but also historical data curve plotting and health level warning. The project consists of hardware, software, and packaging aspects. The hardware will integrate air sensors with a processing unit for data collection, and the software will facilitate data interchange and analysis. Watch-like packaging for containing the integrated hardware will also be designed.

METHODOLOGY

By considering the trade-off between size and measurement performance, we plan to use an MQ-135 gas sensor for air quality detection and an MQ-2 semi-conductor sensor for combustible gas detection. The signal output from the sensors will be processed by an Arduino MCU. The result is then sent to a mobile phone and displayed by the end-user program as an Android application. The data transfer between the MCU and the phone can be obtained by either WIFI or Bluetooth. The entire wearable device system can be broken down into multiple subsystems to tackle, including data acquisition, data processing, data analysis, data communication, Android application, and packaging design.

EXPECTED FINDINGS

A comprehensive wearable air detector, armed with sensor and automatic monitoring technology, is to be prototyped at the end of the project. We look forward to commercialization opportunities for the project outcome and to benefit society.

About the Investigator

My name is Alex Yiu. My interest in Mobile App and Arduino development inspired me to research this area. Dr. Aileen Hou, my supervisor, showed great support in my research topic when I discussed it with her for the first time. This meant I could concentrate on the research direction from the very beginning. I expect the final product could benefit society to inform people about their nearby air quality and share healthcare knowledge conveniently and intelligently. After graduation, I want to be a software or system engineer.

FACULTY OF MANAGEMENT AND HOSPITALITY

Department of Hospitality and Management

WORKPLACE INCIVILITY, WORK ENGAGEMENT, AND OCCUPATIONAL COMMITMENT OF HONG KONG HOTEL CHEFS

CHAN Lok Sum
BA (Hons) in Culinary Arts and Management
Faculty of Management and Hospitality

ABSTRACT

RESEARCH BACKGROUND

The kitchen is illustrated as a high-pressured environment that may contain workplace incivilities such as mistreatment and misconduct. However, there are limited studies that have examined workplace incivility and occupational commitment with regards to work engagement among the occupation of chefs. To deepen the understanding of workplace incivility in chef occupation and fulfill the research gap in the literature, this project explores the relationship between workplace incivility, work engagement, and occupational commitment among chefs.

Objectives

The objectives of the study are to (1) examine the frequency of workplace incivility experienced by chefs from supervisors and subordinates; (2) examine the level of work engagement of chefs in their workplace; (3) assess the influence of workplace incivility of chefs regarding supervisors and co-workers on their work engagement and occupational commitment, and (4) to what extent does workplace incivility predict work engagement and occupational commitment?

METHODOLOGY

Data were collected from 156 chefs (ranked commis, chef de partie, and sous chef or above) from four- and five-star hotels in part- or full-time employment in Hong Kong. Participants gave ratings on their work regarding work incivility, work engagement, and occupational commitment. The data were analyzed using SPSS.

FINDINGS

The results found that workplace incivility and work engagement had a negative correlation, while work engagement and occupational commitment showed a positive correlation. Workplace incivility and occupational commitment also indicated a negative correlation. Work engagement accounted for 33.1% of the variance in work engagement scores, while for workplace incivility, work engagement accounted for 41.9% of the variance in occupational commitment scores.

About the Investigator

I am Simmy Chan. My interest in occupational culture and commitment about chefs inspired me to do this project. Dr Vicky Leung, my supervisor, provided me with lots of insight into the planning process. With experience doing a kitchen internship last summer, I recognized the reality of kitchen work. I hope I can provide insight for management in the food and beverage industry regarding workplace incivility to the occupational commitment of chefs.

EXPLORING THE ROLES OF EMPLOYEE COMMITMENTS BETWEEN TRANSFORMATIONAL LEADERSHIP AND TURNOVER INTENTION

CHEUNG Man Chun
BA (Hons) in Culinary Arts and Management
Faculty of Management and Hospitality

Objectives

This project would investigate whether employees' commitments can influence their turnover intention. At the same time, the study aims to figure out how transformational leadership may affect both commitments and subordinates' intention to leave the company.

ABSTRACT

RESEARCH BACKGROUND

The annual turnover rate of frontline employees in the catering industry has remained high in recent years. Meanwhile, the remaining workers in restaurants are not showing full commitment to their company and occupation. These phenomena have greatly affected the productivity of companies, which also lead to increased unnecessary costs related to human resources.

This project would like to investigate whether transformational leadership is the solution for management/supervisors in the catering industry to increase their level of organization & occupational commitments and retain employees. Moreover, the project seeks to discover how the organization & occupational commitments will affect employees' turnover intention. This research can help improve the long-lasting issue in the industry, and serve as a milestone in developing a new theoretical model.

METHODOLOGY

Questionnaires were distributed to various kinds of workers in the hotel food and beverage (F&B) sectors, and to chained/franchised restaurants. Research participants described their feelings and perceptions toward their supervisors, reviewed their levels of organization & occupational commitments, and turnover intention in the questionnaire. The data was cleaned and analyzed using IBM SPSS software.

FINDINGS

The results showed that transformational leadership could significantly increase both type of employees' commitments and lower turnover intention. While both commitments were the full mediators in the relationship between leadership and turnover intention, it reflected that leadership was not the direct solution to the high turnover rate when commitments were taken into consideration.

About the Investigator

I am Roy Cheung. After working in various companies, I discovered some deeply rooted problems in the F&B industry. Since my dream is to become a restaurant owner in the future, I am interested in finding the causes and solutions to the high turnover rate. The literature showed that a lack of supervision/mentorship/support for employees could be one of the reasons. My supervisor, Dr Vicky Leung, also inspired me to investigate employees' organizational & occupational commitments because these are also her research interests.

INVESTIGATING THE BROWSING BEHAVIOR OF HONG KONG OUTBOUND TOURISTS ON THE CONTENT AND DESIGN OF THIRD-PARTY BOOKING WEBSITES

WONG Kei Yu
BA (Hons) in Hotel Operations Management
Faculty of Management and Hospitality

ABSTRACT

RESEARCH BACKGROUND

Many travelers will use third-party booking websites for booking accommodation or travel packages. Previous studies indicated that online reviews would affect travelers' decisions on booking hotels. However, no study investigates how the design and the content will affect online browsers' preferences when browsing third-party booking websites. This study seeks to find out what factors would influence them the most.

Objectives

This study aims to understand the browsing pattern of Hong Kong outbound visitors who browsed third-party booking websites and traveled in the past 12 months. The study will examine how demographic factors affect behavior and suggest ways to improve the design and content of third-party booking websites.

METHODOLOGY

The study collected 260 questionnaires from Hong Kong outbound visitors who have browsed third-party booking websites and traveled in the past 12 months. The researcher distributed the questionnaires, face-to-face, to respondents, or through an online format. They were required to fill in 3 sections and it took 10-20 minutes to complete. Jamovi was applied to analyze the data. A Likert scale was used for evaluating the four factors. T-test and ANOVA were used to compare the four behaviors and the demographic factors.

FINDINGS

Research findings of this study indicated that most browsers firstly look at the design of the webpage, and then compare the price. After that, they evaluate loyalty before finally viewing the reviews.

It concludes that different ages have different perspectives on customer loyalty and reviews, while different income levels and education levels have different perspectives on price strategy.

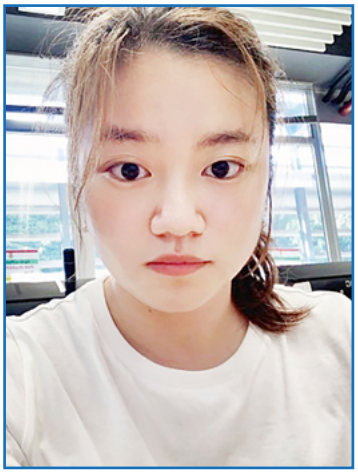
About the Investigator

I am Cherie Wong. My interests are in traveling to different countries and learning different foreign languages. Ms Vance Lam, my supervisor, gave me useful suggestions in the planning stage of this project. The theories and knowledge I have learned in the classroom also inspired me to do this project. I hope my project can inspire third-party booking websites to create tailor-made functions for their target browsers. I want to work in the hotel industry after graduation.

FACULTY OF SCIENCE AND TECHNOLOGY

Department of Construction Technology and Engineering

STUDYING THE PRODUCTION OF ECO BRICKS USING FERMENTED BIO SOLIDS



CHENG Ka Lam
BEng (Hons) in Civil Engineering
Faculty of Science and Technology

ABSTRACT

RESEARCH BACKGROUND

Under climate change, environmental protection gets our attention in different countries. Environmentally friendly bricks are one of the products recognized to help the environment. Many types of environmentally friendly and reusable materials have been studied for making eco paving bricks. A substance called TiO2, can be added into the mixture for producing functional eco paving bricks.

Objectives

The objectives of the study are to conduct a literature review and analyze the date of the review and the information from tests related to paving bricks and the new eco bricks. The study will summarize in a review, the environmentally friendly materials and compare different brick making methods. Also, the study aims to find the reasons why some countries can have better preformation in the area of eco paving bricks.

METHODOLOGY

A summary of the articles and internal news for different literature reviews will be conducted. The study will refer to experimental results to find out the proportion of different environmental protection materials that should be added and the suitable manufacturing method, and its development in different places. Also, by referring to the data for online shops and construction material factories, the rate of inflation, and the average cost and price of each eco-friendly material will be compared.

FINDINGS

It was clearly understood that the properties of each reusable material are important to make good eco paving bricks. In summary, the characteristics of materials such as recycled glass, and plastic eco-bricks are more suitable for Hong Kong. Moreover, environmental awareness and the price of eco paving bricks are the key obstacles hindering its development. It is essential to set up environmentally friendly construction policies and formulate clear indicators.

About the Investigator

I am Ka Lam CHENG. By coincidence, I watch a program about miracle construction projects around the world. Little by little, it aroused my interest. I am interested in wall traffic construction and water conservancy projects. Hence, I chose the topic “Production of Eco Bricks by using Fermented Bio Solids” for my final year project (FYP) because bricks are commonly used in wall traffic constructions, and they have a great impact on the environment either on water or air quality. Prof. Keane, Yao Hui LIU is my FYP supervisor. When I was working on my FYP, his broad knowledge and insightful thinking have been a great value for me.

CHUN Wa Choi
BEng (Hons) in Civil Engineering
Faculty of Science and Technology

CRITICAL SUCCESS FACTORS TO NEC ADOPTION AMONG PRIVATE SECTOR CLIENTS IN HONG KONG

Objectives

The NEC families of contracts are collaborative and provide a better solution suited for project needs. Through a questionnaire survey, this study asked respondents of private sector clients about the critical success factors that may assist the adoption of NEC.

ABSTRACT

RESEARCH BACKGROUND

The Development Bureau has adopted the New Engineering Contract (NEC) in capital works projects in Hong Kong. The technical circular has ignited the use of NEC in many projects; nearly thirty projects are in the execution phase. The adoption of NEC, however, is limited to Government projects. This study aims to understand the suitability of NEC contracts for private sector clients; through factors that would help private sector clients to rethink their procurement approach.

METHODOLOGY

To figure out the critical success factors in NEC, which will lead to a successful project for private sector clients. The methodology includes a literature review and a questionnaire. A descriptive method and a frequency method were used to analyze the results and identify the factors.

FINDINGS

The results of this study suggest fifteen critical success factors under five constructs that provide sound justification for adopting NEC in projects. The five constructs are: better management of change through compensation events, proper risk allocation for all parties, an incentive for working with high standards, collaborative foresight, and a simple form of contract.

About the Investigator

My name is Chun Wa Choi, and my interests are listening to music, watching animations, and playing games. Of course, I also read books and study. As a graduate, I hope to find a job that suits me. In my final year, I want to thank my supervisor, Dr. Memon Shoeb Ahmed, for his guidance. He was patient and helped me to complete my FYP step-by-step.

A STUDY OF GROUND WATER TABLE LIFTING BY SAND COLUMNS

KWONG Chi Hin
BEng (Hons) in Civil Engineering
Faculty of Science and Technology

ABSTRACT

RESEARCH BACKGROUND

To create a green city, a new idea is proposed. Using groundwater for irrigation of plant reduces the use of water resources and becomes energy efficient. The design may be applied in gardens on the ground floor and green roofs. Compare to traditional irrigation, it reduces the cost in labour and water fees but relies on the efficiency of groundwater usage. Therefore, this project explores the use of groundwater for irrigation of plants.

Objectives

The main objective of this project is to analyze the utilization of groundwater in plantation. It also aims to study methods for improving the use of groundwater.

METHODOLOGY

The relative factors will be analyzed in this project by studying the literature on different experiments, such as capillary action and pore size relationship. The results will be analyzed and compared.

FINDINGS

It was found that the degree of mixture of different soil textures will affect the capillary reaction. The difference in the grain size of the medium and fine sand shows the relationship between grain size and capillary action is negative. The volumetric water content and pressure also have a negative relationship. Also, large pore size has a significant variation in the result which may induce errors.

About the Investigator

I am Anson Kwong. My career goal is to become a civil engineer. My supervisor, Dr Keane Yaohui LIU, gave me useful advice in organizing the enormous amount of information on the project. In retrospect, I gained a lot of professional knowledge and skills from the Institute, which gave me confidence to identify my career path.

STUDY OF SOLID DEPOSITION AND TRANSPORTATION IN SEWAGE SYSTEM

LEE Ka Wai
BEng (Hons) in Civil Engineering
Faculty of Science and Technology

Objectives

The main objective of this study is to test how far solids could be transported in a toilet system under different designs and water volume, to determine a water-saving design for a flushing toilet system. Other specific objectives include a literature review, determining which design is more efficient by testing different water volumes, and investigate the mechanics of the flushing toilet, etc.

ABSTRACT

RESEARCH BACKGROUND

Water is quite an important resource for us; however, it is not unlimited. As the freshwater resource is precious, it is important to design a water-saving Solid Deposition and Transportation sewage system. For example, in the U.S., 4,500,000,000,000 liters of fresh water is used for flushing every single year.

METHODOLOGY

The analysis of this project includes a literature review, practical testing, and some test comparisons for past tests. During the practical testing, the capability of the flushing toilet could be tested using different combinations of designs such as flush volume, pipe slope, pipe diameter, etc. That way, the most efficient and water-saving design could be identified.

FINDINGS

The findings show that using 4.5L flush volume is capable to flush away the wastewater in normal use, and it is more water-saving then the current standard of a 6L flush volume. The designs of the pipe are also concluded, where the pipe slope should be greater than 1/40 and the diameter should be less than 100mm.

About the Investigator

I am Lee Ka Wai, a year 4 student and preparing for work. I hope I could use the knowledge which I learned from school to contribute to society. My project entitled “Study of Solid Deposition and Transportation in Sewage System”, is an interesting topic which increased my knowledge of drainage design. Dr. LIU Yao hui is my supervisor and has provided me with lots of help.

THE TRANSPORTATION FLOW CONTROL ON HONG KONG ROAD BORDERS

ONG Tsz Wing Jerry
BEng (Hons) in Civil Engineering
Faculty of Science and Technology

ABSTRACT

RESEARCH BACKGROUND

Recently, there has been an increasing demand for road borders between Hong Kong and the Greater Bay Area in China. This research is interested in investigating the traffic flow movement and traffic coordination to meet the increasing demand for traffic flow in Hong Kong.

Objectives

The main purpose of the research is to achieve a Traffic Diversion plan based on existing secondary research data published by the Government. Utilizing a software named EViews10, Traffic Simulation can be conducted using econometric and statistical analysis. The various variable's relationships can be forecasted for early warning systems of the transportation flow for each border.

METHODOLOGY

Concerning primary research, data will be collected for around 300 users of selected road borders. Data will be collected using a questionnaire on the user's trip objectives, with regards to different factors, and to find out which period is the peak hour.

As for secondary research, the statistics document released by the Transportation Department will be used to study data on passenger arrival and departure and vehicular traffic access through the borders each year.

EXPECTED FINDINGS

This project is expected to provide optimal traffic routing, and it aims to achieve traffic diversion to ease traffic congestion across Hong Kong's road borders. Transportation flow is mainly affected by economic factors. A Traffic Simulation using the EViews10 software will handle the economic and statistical analysis in this study. For example, EViews10 can formulate the equation related to various economic factors.

About the Investigator

My name is Ong Tsz Wing, Jerry. My keen interest in the Transportation Engineering field has inspired me to do a transportation-related project. I am an internal Vice Chairman and a student member of the Hong Kong Sea Transport and Logistics Association. My project advisor is Raymond Fu, who gave guidance on my FYP in the early stages. I hope this FYP can help improve the existing transportation flow of Hong Kong's road borders.

TANG Yin
BEng (Hons) in Civil Engineering
Faculty of Science and Technology

A STUDY OF SEA WATER BATTERY FOR POWERING OCEAN MEASUREMENT DEVICES

Objectives

- Study how Sea Water Battery (SWB) can be more efficient for Powering Ocean Measurement Devices under different conditions.
- Study factor which affects the Sea Water Battery's efficiency through changing the condition such as temperature, concentration, the flow speed of seawater, and the performance of electrode materials, etc.

ABSTRACT

RESEARCH BACKGROUND

Ocean measurement devices are important for obtaining the change in seawater quality and for investigating the ocean eco-balance. However, these devices are powered by battery or undersea cable which are an expensive way for power supply. This study aims to investigate the power generation by using seawater (seawater battery) and the efficiency of energy production and consumption. In this project, the purpose would be to study how Sea Water Battery (SWB) can be more efficient for Powering Ocean Measurement Devices under different conditions.

METHODOLOGY

The analysis method includes materials comparison, low speed comparison, and Different and Same Salinity comparison. These would compare the different sets of seawater battery which have different materials as the anode and cathode to compare their voltage and current readings in different conditions.

FINDINGS

The performance of the metal pairs in ascending order are Aluminum-Iron, Copper-Iron, Aluminum-Zinc, Copper-Aluminum, Zinc-Iron, Copper-Zinc. The copper-zinc pair was found to outperform the other 5 metal pairs.

The reading of Voltage and Current at a dynamic state is larger than that at a static state.

The performance of the seawater battery system is directly proportional to Salinity.

The Reading of Voltage and Current at the electrolyte of pure seawater battery is larger than that of the mixture with sea salt and distilled water, because pure seawater contains other chemical compositions which can conduct electricity.

About the Investigator

I am Tang Yin, a Bachelor of Engineering student in Civil Engineering Studies at the Technological and Higher Education Institute of Hong Kong (THEi). I have been interested in the construction industry since I was a child, and my career goal is to be a professional engineer and participate in the construction of Hong Kong. My supervisor, Dr. Keane Liu, supported me on my final year project during the research and writing up of the project. His broad knowledge and insightful thinking have been of great value to me, especially in the COVID-19 situation.

DEVELOPMENT OF AN INTELLIGENT GREEN ROOF MAINTENANCE SYSTEM

TO Chin Fung
BEng (Hons) in Civil Engineering
Faculty of Science and Technology

ABSTRACT

RESEARCH BACKGROUND

Green Roofs are one of the green infrastructures that is increasingly constructed all around the world currently. However, green roofs require regular maintenance to ensure it is in a good condition. Maintenance procedures include irrigation, using herbicide, and drainage. The importance of this project is that it seeks to explore a new trend to the green roof development.

Objectives

The objective of this study is to analyze the development of green roofs in various countries and propose an intelligent green roof maintenance system. The study will determine whether the system can be applied to the current environment based on the developing trend.

METHODOLOGY

The analysis is based on a vast amount of studies and data, including research articles, government data, and census data. In the comparison of various green roofs, some aspects will be chosen. For example, roof size, city size, population, building density, and purpose. Applying technologies to green roofs where applicable, the points of interests will be "why it is replaceable?" and "how it can apply to green roof?"

FINDINGS

It is discovered that implementing cloud computing and artificial intelligence to maintain a green roof is possible. However, it is concluded that an intelligent green roof maintenance system has high efficiency, but the need for an intelligent green roof maintenance system in current times is uncertain.

About the Investigator

My name is TO Chin Fung, Leon. My interests in technology, computing, and my 4 years of knowledge related to civil engineering inspire me to do this project. Dr. Keane LIU, my supervisor, provided me useful advice and recommendations during the writing of this report. I would like to participate in the science or technology field in the future, as I think the cutting-edge technologies are currently very interesting and creative. They are very attractive because their development increased drastically over the last few years.

COASTAL FLOODING IN HONG KONG DUE TO SEA-LEVEL RISE

TONG Man Po
BEng (Hons) in Civil Engineering
Faculty of Science and Technology

Objectives

The study aims to review storm surge parameters from 2000 to 2018 and investigate the height of the sea level and storm surges from shallow to deep. Past cases of storm surges, such as the Super Typhoon HATO in 2017, and other tropical cyclones that have induced severe storm surges were investigated. Flooding maps were created for Tai O based on a design case.

ABSTRACT

RESEARCH BACKGROUND

The severe inundation that resulted from Super Typhoon MANGKHUT in 2018 has triggered Hong Kong citizens to ponder over the maximum sea level that could be reached under the influence of tropical cyclones. However, nobody was able to answer related questions at the time because of the lack of research. This research aims to analyze the data collected in recent years to promote storm surge study in Hong Kong.

METHODOLOGY

Tide data from eleven tide gauge stations operated by the Hong Kong Observatory, the Marine Department, and the Drainage Services Department were collected. These tide data and storm surge parameters were analyzed as the supporting data for further study. A mathematical storm surge model comprising barometric tide, wind stress tide, and wave setup was adopted for the simulation and the design for the case of the super tropical cyclone. Finally, flooding maps can be drawn based on the predicted sea level.

FINDINGS

For the design of the super tropical cyclone, it is found that the maximum storm surge and maximum sea level could reach 4.95m above the astronomical tide and 8.06mCD respectively. This means it could flood most of the areas in Tai O.

About the Investigator

I am Bowie Tong, a civil engineering student who cares about how citizens in Hong Kong could live better with the advancement of technology. As a citizen who loves nature and this city, I would like to participate in works related to this city, such as being a Civil Engineer. My supervisor, Prof. Kwok Leung PUN, is an outstanding scholar in coastal engineering, and an enthusiastic educator who has guided me well and encouraged me to complete my research.

BOUNDLESS CREATION THEOREM: CRITICS ON CATALYSTS OPTIMIZATION FROM LIGNIN FOR PRODUCTION OF BIOFUEL

WONG Shuk Yi Candy
BEng (Hons) in Environmental Engineering and Management
Faculty of Science and Technology

ABSTRACT

RESEARCH BACKGROUND

Previous case studies indicated that traditional methods were not effective and efficient in presenting the critics on catalysts optimization from lignin for the production of Biofuel. Many researchers could not formulate the concept because they did not know how to give a proper method. Some know the "What's" but do not know the "How's"; some know the "How's" but do not know the "What's". To help overcome the difficulties of understanding the topic, this project proposes to include the New Theorem & Logic Methodology as an inspiring tool in catalysts optimization.

Objectives

The main purpose of the current study is to formulate new ways of seeing the potential of catalysts clearly if the New Theorem & Logic Methodology has improved the catalysts optimization. It also aims to identify useful information to better understand the catalyst optimization in an economic analysis.

METHODOLOGY

Data will be collected by analyzing graphs and tables in this study. The analysis will be on the performances of selected catalysts for optimization from lignin for production of Biofuel. The catalysts will be given ratings on their performance before and after the inclusion of the New Theorem & Logic Methodology in catalyst optimization. Professors will be asked to comment on this method instead of conjecturing alone.

EXPECTED FINDINGS

It is anticipated that the catalysts would have higher performances by using these approaches. The catalysts can list out some useful information in this field. They are also expected to show some improvements on the production of Biofuel with the New Theorem & Logic Methodology in the future.

About the Investigator

I am Candy Wong. My interests in engineering/chemistry teaching inspire me to do this project. Dr Helen Lu & Dr Alex Tsang are my supervisors. They gave valuable advice in the planning stage. I hope I can renovate the traditional method of Catalysts Optimization and add some new insight to the field. I have enjoyed conducting experiments since I was in Form 1, so I have lots to share on the topic of chemistry. I want to be an engineer, scientist, or researcher in Environment & Chemistry after graduation.

CHAN Sui Hing
BEng (Hons) in Building Services Engineering
Faculty of Science and Technology

Objectives

The main purpose of this research is to investigate the impact of light nuisance on the units of a highly-dense residential estate in Hong Kong through light trespass caused by the neighboring residential units of the same estate.

BACKGROUND LIGHT LEVEL FROM NEIGHBORING RESIDENCES IN ON TAI ESTATE OF HONG KONG

ABSTRACT

RESEARCH BACKGROUND

While lighting from densely packed high-rise buildings paints a beautiful nightscape for Hong Kong, frequent complaints against light nuisance arise. Vertical illuminance on windows is commonly used to assess light trespass. The measured value of this parameter can result from all surrounding light sources, including the spill light from neighboring residences. This project aims to investigate the impacts of light nuisance due to background light from neighboring residences in a local public estate.

METHODOLOGY

Lighting simulations were conducted in On Tai Estate, and the situation of light trespass of the residential units due to the spill light from the neighboring units was analyzed. DIALux was the computer software used. Vertical illuminance of the units' windows facing outside was calculated. On Tai Estate was chosen because it is one of the most highly-dense populated estates in Hong Kong and of the Elongated Cruciform that has been adopted in recent years. The calculated results were compared with the required values during the pre-curfew and post-curfew periods, as stated in local design guidelines.

FINDINGS

It was found that the design of Elongated Cruciform residential estate has negative impacts on light nuisance due to light trespass from neighboring units. It is suggested that the opposite window arrangement should be re-arranged to avoid direct light trespass.

About the Investigator

My name is CHAN Sui Hing. I am interested in building services engineering since this subject is highly related to our daily life. A building service engineer can improve our living conditions greatly by providing an optimal design. I would be grateful when occupants are satisfied because of my professional design decisions. I would like to share my experience with the new generation in the future and encourage them to engage in this field. I thank my supervisor, Ir Dr Roger Ng, for his assistance in my research project.

APPLICATION OF BIM IN BUILDING HVAC ENERGY CONSUMPTION ANALYSIS

CHIU Sung Chi
BEng (Hons) in Building Services Engineering
Faculty of Science and Technology

ABSTRACT

RESEARCH BACKGROUND

Previous studies indicated that Building Information Modelling (BIM) could assist in enhancing energy efficiency in building projects. The local construction industry has hesitated in adopting BIM in their projects confidently because they may not know the full potential of BIM technology in energy analysis. This project reveals the potential of BIM technology in building energy analysis to help the industry cross over the hurdles of adopting BIM.

Objectives

The main purpose of the study is to explore the suitability of adopting BIM technology for building energy consumption analysis in minimising building energy use. It also aims to apply BIM technology in HVAC energy consumption analysis with different combinations of building environmental factors and evaluate the effectiveness of BIM in building energy consumption simulation.

METHODOLOGY

Data was collected by conducting building HVAC energy analysis by using BIM software. The most effective factor in improving energy consumption was identified. The workflow in adopting BIM technology for building HVAC energy analysis was recorded to evaluate the effectiveness of BIM in building energy consumption simulation.

FINDINGS

It is concluded that BIM technology is suitable for determining the best building design to reduce building energy consumption. BIM technology is mature in building energy analysis as the overall workflow is smooth with an array of BIM toolkits that are available for building energy analysis. However, localisation of BIM software could possibly be seen if more building projects in Hong Kong adopt BIM technology during the design stages.

About the Investigator

I am Alex Chiu. I am interested in applied technology. Building services engineering knowledge has inspired me to put BIM as my focus in my final year project. Ir Dr Roger Ng, who is my supervisor, has provided me with countless guidance along the journey of this research. I hope that my project could revamp the traditional project delivery method of the local construction industry and show the potential of BIM technology in enhancing building energy efficiency. I am delighted to develop a career that allows me to utilise my engineering skills while equipping myself to become a chartered engineer.

FEASIBILITY STUDY ON FREE COOLING FOR OFFICE BUILDINGS IN HONG KONG

HO Chun Kit
BEng (Hons) in Building Services Engineering
Faculty of Science and Technology

Objectives

This research aims to investigate the possibility of adopting the free cooling technology in Hong Kong office buildings. Building projects with the free cooling integrated system is studied to analyse the potentials and energy conservation of free cooling ventilation in Hong Kong office buildings under the characteristic of the local climate.

ABSTRACT

RESEARCH BACKGROUND

Due to the tremendous power demand of air-conditioning systems for commercial buildings, the tendency of promoting energy conservation and embedding sustainability considerations have been developed to minimise the impact on the environment. One of the energy-saving technologies in the MVAC system, such as free cooling, commonly applies in foreign data centres and commercial buildings. Thus, this study seeks to investigate the feasibility of free cooling technology for office buildings in Hong Kong, as there is a rare practical application of this in Hong Kong.

METHODOLOGY

Mean enthalpy of each day in 2019 is plotted to identify the number of days that satisfy the operating conditions of an air economiser. Three supply air conditioners are set up to study their potential for the free cooling technology. The annual energy conversation and carbon reduction are then estimated from the power consumption based on the cooling load profile. The payback period is evaluated in terms of the installation and operation cost in order to assess the worthiness of this investment.

FINDINGS

The available duration of free cooling in 2019 under 52.658 kJ/kg supply air enthalpy lasts for 99 days, from late-November to mid-March. Annual power consumption and carbon emission are reduced by 540.91 MWh and 382.45 tons respectively under annual air economiser operation.

About the Investigator

Photography and videography are my favourite hobbies, as photos provide physical memories captured from the best moments with unforgettable emotions. Taking micro-movies is also my interest since I enjoy writing scripts and bringing them to life on the screen. I am keen on cycling as I love to pursue the thrill of speed, which enables me to release my stress and irritations. I enjoy doing volunteering work to understand the needs in the community and to provide care and love those who need it. It is also to introspect myself on attitudes and the satisfactions of life. I target on taking over large projects of building services system to develop a further practical understanding of the engineering industry in comparison to the theoretical knowledge learned in THEi. I aim to be a Chartered Building Services Engineer with the accumulation of work experience.

Name of FYP Supervisor: Ir Wu Chun Fai, David

A STUDY ON SEAWATER DESALINATION BY SOLAR POWER

IP Ka Wun
BEng (Hons) in Building Services Engineering
Faculty of Science and Technology

ABSTRACT

RESEARCH BACKGROUND

Previous studies have debated whether desalination applied with solar power is efficient or not. Studies have also investigated the reasons to apply desalination technology to produce fresh water. Research indicated that more than 70% of the Earth's surface is covered with water, where fresh water was only found to be 2.5%. This quantity of fresh water is not sufficient for the whole world. Also, the distribution of fresh water around the world is not consistent, hence solar desalination could produce fresh water for people who live in poor countries or have water deficiency problems.

Objectives

The main purpose of the present study is to evaluate the feasibility of processing solar desalination in aspect of economic analysis. Its aim is to assess the sustainability of solar desalination through the effect of the environment.

METHODOLOGY

For creating the survey, the target of number of respondents was around 120 people. The purpose of the survey was to investigate the respondents' understanding of solar desalination and evaluate the feasibility of this technology. In addition, the research includes the payback calculation, which is the persuasive information used to explain that solar desalination is the feasibility technology to produce fresh water.

FINDINGS

Although solar desalination has some impact on the environment, solar desalination can improve the water shortage problem to sustain human life. Also, desalination applied with solar power can reduce electricity consumption, and the payback period does not take too long to reach a balance between the cost and the environment.

About the Investigator

I am Karen IP. My interest is in sports, such as playing volleyball and hiking. The conducive information and advice in this project are provided by my supervisor, Ms Sherry Yiu. I hope I can be a professional consultant one day because my technical knowledge can be applied to achieve clients' needs and design a different system. This post would have numerous challenges in work design and communications, therefore, problem-solving skills and communication skills can be improved during working. Last but not least, I will feel great satisfaction after completing the project.

A REVIEW ON HONG KONG BIM STANDARDS

LAM Chi Lap Jelly
BEng (Hons) in Building Services Engineering
Faculty of Science and Technology

Objectives

This study focuses on the BIM standards in Hong Kong. It summarizes the similarities and differences of the BIM standards of various aspects, including the scope of application, technical requirements, management procedures and other miscellaneous aspects. The results could give the readers a brief understanding of the BIM standards that are currently adopted in Hong Kong.

ABSTRACT

RESEARCH BACKGROUND

Building Information Modeling (BIM) is the process of generating a 3D digital representation of building data throughout its whole lifecycle. It brings a revolution to the building industry. Being a new trend of technology, BIM faces a big problem – every user applies the technology based on their understanding which may reduce the communication efficiency with users coming from another discipline. Therefore, an overall review of BIM standards and guidelines are necessary.

METHODOLOGY

A total of eight local BIM standards were reviewed in this study. The standards could be downloaded from the website of CIC and other relevant government departments and organizations. The comparisons among the selected standards in terms of the documentation requirements, technical requirements, workflow, and submission format requirements were conducted in order to provide a clearer view of the local BIM standards to every BIM user.

FINDINGS

The outputs of the study include a summary of the requirements of different local BIM standards. It was found that some of the standards are interrelated, especially those used in different departments of the government. Some inconsistencies were identified among different disciplines and BIM model elements, which may impact the accuracy of the model and reduce the efficiency of coordination.

About the Investigator

My name is Jelly Lam, a final year student from BEng in Building Services Engineering. I am interested in making innovative engineering designs and I wish to be an engineer in the future. I conducted my final year project on the topic of “Review of Hong Kong BIM Standards”. My supervisor is Dr Penny Pan. She has helped me a lot in the research project. I would like to express my thankfulness to her.

A COMPARATIVE STUDY OF INDOOR THERMAL COMFORT DESIGN CRITERIA BETWEEN HONG KONG AND MAINLAND CHINA

TSANG Yee Ting
BEng (Hons) in Building Services Engineering
Faculty of Science and Technology

ABSTRACT

RESEARCH BACKGROUND

Indoor thermal comfort has significant impacts on occupants' health and productivity. It also plays an important role in building design and energy conservation. With the deep integration of the Greater Bay Area, the cooperation between Hong Kong and Mainland China increases rapidly. It is necessary to conduct a study to review and compare the indoor thermal comfort design criteria adopted in Hong Kong and Mainland China, to enhance the communication effectiveness for engineers and researchers from the two places.

Objectives

This study aims to compare the indoor thermal comfort criteria adopted in Hong Kong and Mainland China. The objectives of this study are to (i) review the standards about indoor thermal comfort design criteria used in Hong Kong and Mainland China, and (ii) identify the similarities and differences of the criteria of the two places.

METHODOLOGY

In this research, an overall review of the standards related to the indoor thermal comfort adopted in Hong Kong and Mainland China was conducted. Buildings were classified into different categories according to their types. In each category, the detailed requirements of the indoor thermal comfort design criteria of the buildings, such as air temperature, relative humidity and air speed, were listed and compared.

FINDINGS

The major outcome of this research is the comparison results of the indoor thermal comfort design criteria for different types of buildings in Hong Kong and Mainland China. The detailed requirements are listed. The findings can be provided to the engineers or researchers from Hong Kong and Mainland China for easier reference.

About the Investigator

My name is Taffy Tsang. I would like to express my honest gratitude to my supervisor, Dr Penny Pan. I will be graduating with a bachelor's degree in Building Services Engineering and I have already obtained a full-time job in the industry. My long-term goals are to learn the various engineering knowledge and eventually become an engineering teacher. Therefore, I understand I must learn well the basics at the entry-level and build a solid foundation for my dream.

FACULTY OF SCIENCE AND TECHNOLOGY

Department of Food and Health Sciences

A STUDY OF HONG KONG RESIDENTS' KNOWLEDGE OF MILLET

CHUNG Hoi Yiu
BSc (Hons) in Health Care
Faculty of Science and Technology

ABSTRACT

RESEARCH BACKGROUND

Millet has high nutritional values. They are the main grains in the northern part of China. However, the use of millet is uncommon in Hong Kong, and that may be related to people's lack of knowledge about it.

Objectives

To understand people's level of knowledge of millet in Hong Kong in respect of age group, gender, and education level.

METHODOLOGY

A cross-sectional study was conducted to investigate Hong Kong residents' knowledge level of millet. Using a snowball sampling technique, self-designed electronic questionnaires (Google form) with 8 questions including, basic knowledge, nutrition, and the advantage of millet, were administered. The questionnaire had been validated by 7 experts (CVI=0.87). The target sample size was 384.

FINDINGS

A total of 304 effective questionnaires were collected. The mean, median, and range of the questionnaire score were 2.71(±2.03), 3, and 0-7, respectively. The mean scores of males and females are 2.39(±2.08) and 3.03(±1.94) respectively; age groups between 18-40, 41-64 and >65 were 2.57(±2.03), 3.07(±1.96), and 2.5(±3.54) respectively; and the mean score of education level at primary level or below, secondary, and university or above were 2.5(±3.54), 3.02(±2.04), and 2.64(±2.03), respectively. The knowledge score of females was significantly higher than males (p=0.007), and there were no significant differences between age groups (p=0.174) and education level (p=0.396). Overall, Hong Kong residents' knowledge level of millet is low.

About the Investigator

I am Yoyo Chung, and I am studying Health Care. Eating is one of my interests, and I always think about "how to eat healthily?" Therefore, I am interested in food research, which inspired me to do this project. For my future, I also want to have a healthcare-related career. Dr Wesley CHOW, my supervisor, had given me a lot of suggestions and support in the project.

SIN Pui Yi
BSc (Hons) in Health Care
Faculty of Science and Technology

NEW HEALTHY FOOD DEVELOPMENT

Objectives

The study aims to investigate HK elderly's snack preferences. A healthy snack is developed based on the results of the investigation.

ABSTRACT

RESEARCH BACKGROUND

The aging population is undoubtedly a global problem. With uneven welfare distribution, it is difficult for the elderly in Hong Kong (HK) to lead a healthy life. One problem is limited snacking options for the elderly in the HK market. By improving the problem, it can help maintain their physical, psychological, and social well-being. It also improves the elderly's dietary habits, such as insufficient intake of fruits and vegetables. Therefore, the project proposes a fresh juice drink as a snack, which follows the elderly's intake requirements of special nutrients.

METHODOLOGY

The research is divided into two stages. In the first stage, 40 HK elderlies were invited to participate in a questionnaire survey on their snacking habits and preferences. In the second stage, a new healthy snack was developed based on the special nutritional requirements and the results from the first stage. A sensory evaluation was conducted with ten participants to ensure that the taste, texture, and appearance of the snack were suitable for the elderly. A tailor-made nutrition label and packaging were also designed to facilitate use by the elderly.

FINDINGS

The questionnaire study revealed that the elderly prefers soft and sweet snacks. A new fresh juice drink was developed based on the results. The product can help the elderly increase their daily intake of fruits and vegetables and reduce the risk of cardiovascular diseases. It also provides a new snack option, thereby helping to improve the elderly's quality of life.

About the Investigator

I am Natalie Sin. I am passionate about the development of the elderly. My previous research and volunteering experience gave me a lot of valuable experiences and developed my concerns about the distribution of welfare in Hong Kong. I want to thank my supervisor, Dr. Ivy Sy, for providing me with great support and inspirational ideas when completing this project. I hope that my developed product can contribute back to society and help improve people's quality of life. I also hope that this will become part of my future career and help more people in need through innovative thinking.

A SURVEY ON HONG KONG PEOPLE'S UNDERSTANDING ON CHINESE HERBS USED FOR TREATMENT OF HAIR LOSS

SIU Pui Ying
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Faculty of Science and Technology

ABSTRACT

RESEARCH BACKGROUND

Hair loss is a common yet distressing symptom, especially for the elderly and middle-aged population. Traditional Chinese Medicine (TCM) can show a significant effect on the treatment of hair loss without notable side effects. This study seeks to provide more quantitative information regarding Hong Kong citizens' level of knowledge on the respective Chinese herbs used for the treatment of hair loss.

Objectives

This study aims to investigate the knowledge level of Hong Kong citizens regarding the Chinese herbs used for the treatment of hair loss using a survey questionnaire.

METHODOLOGY

A survey was designed for a cross-sectional study to collect the respondents' knowledge of Chinese herbs used for the treatment of hair loss. A self-administered online questionnaire with 5 knowledge-related questions was distributed through the Internet from 5 February to 11 March 2020 (CVI = 0.94). A simple random and snowball sampling method was used to select the respondents of the questionnaire. Respondents were grouped by their age groups, educational levels, and gender. A total of 329 valid responses were received.

FINDINGS

The questionnaire used a scale-ranking of 1 to 5. Among the 329 respondents, the mean score of the sample population was 1.53 (SD = 1.252). In terms of the level of understanding of the Chinese herbs included in the questionnaire, there was no statistically significant difference in the mean score between male and female subjects ($p = 0.176$). The mean score of subjects aged 60 or above was significantly different from that of the subjects aged 18-39 ($p = 0.001$), and that of subjects aged 40-59 ($p = 0.005$). The mean score of the "Undergraduate or above" group was significantly different from that of the subjects in the "Secondary school" group ($p = 0.012$), but not the "Below secondary school" group ($p = 0.0874$).

About the Investigator

I am Jennifer Siu. My experience of studying a few years of Traditional Chinese Medicine inspired me to do this project. Dr. Wesley Chow, my supervisor, gave me useful advice when doing the project. I hope more people can be more interested and have better understanding of this ancient yet useful medical treatment. As a student in the Health Care degree programme, I hope I can become a professional in the field of healthcare management upon completion of my study.

LAM Magie
BSc (Hons) in Food Science and Safety
Faculty of Science and Technology

AN INNOVATIVE REDUCED-CALORIE FOOD MADE WITH KONJAC FOR DIABETICS

Objectives

The main objectives of the study are to develop a low-calorie glutinous rice dumpling with konjac. The centre will have a creamy filling made from antioxidant-rich food sources. The study also aims to investigate the preference and acceptance of the new konjac glutinous rice dumpling.

ABSTRACT

RESEARCH BACKGROUND

Diabetes Mellitus (DM) is a common chronic disease in Hong Kong. Type II (DM) patients are required to limit their carbohydrates intake to control their blood glucose to a reasonable level. This means sugar and calorie intake control are very important to alleviate the conditions for these patients. To provide consumers with more choices for healthy food, this project seeks to produce a reduced-calorie healthy food with konjac.

METHODOLOGY

Experiments and trial production were conducted to make a successful glutinous rice dumpling with konjac. Different ingredients like avocado, green tea, and tofu that are beneficial for diabetics were used to make two new filling samples. A total of 125 students were invited to take the survey to examine the preference of the healthy reduced-calorie glutinous rice dumpling and the acceptance of the new flavor fillings.

FINDINGS

The best ratio of konjac powder and glutinous rice flour was found to be 1:6.5, and the calorie of the dumpling reduced by at least 15%. Taro tofu filling and matcha avocado filling were developed. About 97.6% of the surveyed respondents were interested in the new konjac glutinous rice dumpling. Furthermore, most of the respondents would like to try the two new fillings but more people were willing to try the matcha avocado flavor.

About the Investigator

I am Lam Magie. I am interested in food nutrition and food that is beneficial for health. My FYP supervisor, Dr. Vicki Fong, gave me a lot of support and advice, which helped me develop an understanding of the project. I think the feeling of success in successfully developing a new product is very rewarding, and I hope more interesting food products can be developed in the future. After graduation, I would like to have a job related to research and development or quality assurance.

THE EFFECT OF PROBIOTIC BACTERIA IN REDUCING ACRYLAMIDE CONTENT IN COFFEE

LO Ho Wing
BSc (Hons) in Food Science and Safety
Faculty of Science and Technology

ABSTRACT

RESEARCH BACKGROUND

According to the news, the Centre for Food Safety in Hong Kong has researched acrylamide in food and found that over 99% of biscuits or snacks contain acrylamide. It is formed in starchy foods when baked or fried at a temperature of 120°C or higher. Acrylamide is classified as a Group 2A chemical (probably carcinogenic to human) by the International Agency for Research on Cancer in 1994. To reduce the amount of acrylamide in food, three different probiotic strains: *Bifidobacterium longum* (*B. longum*), *Lactobacillus acidophilus* (*L. acidophilus*), and *Lactobacillus casei Shirota* (Yakult bacteria) (*L. casei*), were selected to evaluate the ability of probiotic bacteria in reducing acrylamide.

Objectives

The project aims to evaluate the efficacy of three different probiotic strains: *Bifidobacterium longum* (*B. logum*), *Lactobacillus acidophilus* (*L. acidophilus*) and *Lactobacillus casei Shirota* (Yakult bacteria) (*L. casei*) in reducing the acrylamide content of acrylamide standard solution. It also aims to evaluate the development of probiotic food products in Hong Kong and to review the possible factors affecting the level of acrylamide in coffee.

METHODOLOGY

Product research was conducted. Products that contained the ingredient 'probiotics' were found in the local markets. Pictures were taken for record-keeping. The information about the products was recorded and organized into an Excel form. Data analysis was conducted, and the results were presented. In evaluating the ability of probiotic bacteria in reducing acrylamide, probiotic bacteria were incubated with acrylamide standard solution and analyzed by LC-MS (Liquid Chromatography-Mass Spectroscopy).

FINDINGS

The result showed that Hong Kong is a potential market for probiotic food products and most of the probiotic food products found are yoghurt and yoghurt drinks. *Lactobacillus acidophilus* (*L. acidophilus*) which is a common probiotic bacterium found in yoghurt has the highest reduction capacity of acrylamide.

About the Investigator

I am Wing Lo. In my spare time, I like trying new baking recipes for foods like cookies and cakes. My supervisor, Dr Emily Choi, has given me advice and suggestions in the planning stage, as well as lots of support throughout this period. It is a breakthrough if probiotic bacteria can successfully reduce carcinogenic substances in food since I love eating snacks, especially biscuits and chips. It is important that we can enjoy our favorite foods but also be safe and healthy. After graduation, I would like to work for a food company to maintain the safety and quality of food.

THE SYNERGISTIC EFFECT OF PROBIOTICS BACTERIA TO REDUCE ACRYLAMIDE IN FOOD

NG Fu Him
BSc (Hons) in Food Science and Safety
Faculty of Science and Technology

Objectives

To investigate the efficacy of 3 probiotic strains (*Lactobacillus acidophilus*, *Lactobacillus casei Shirota*, and *Bifidobacterium longum*) in reducing different concentrations of acrylamide standard solutions alone and in combination. By achieving this, probiotics and probiotic formulas that have the most acrylamide reducing ability can be found. They can then be used to reformulate foods to reduce the amount of acrylamide.

ABSTRACT

RESEARCH BACKGROUND

Acrylamide is a chemical substance that may lead to cancer. It is not likely to be found in food products. However, cooking methods such as baking, roasting and frying may form acrylamide unintentionally. Popular snacks such as biscuits contain acrylamide. Recently, a study showed that probiotics can remove acrylamide by physically binding it through the cell walls of bacteria and produce enzymes to break it down. Therefore, this project aims to find the acrylamide reduction ability of common probiotics.

METHODOLOGY

For the methodology of this experiment, we first prepared the probiotics. Then, we added the probiotics into the acrylamide solution and incubated it. Finally, the amount of acrylamide in the samples and the control samples were checked using a Liquid Chromatography-Mass Spectroscopy (LC-MS). The results of the LC-MS were used to calculate the acrylamide reduction percentage of each probiotic.

FINDINGS

The experimental results showed that *Lactobacillus acidophilus* has the highest AA reduction ability, which can reduce around 32-35% of acrylamide content at these 3 concentrations among the selected probiotics. The combination of *Lactobacillus casei Shirota* and *Bifidobacterium longum* had the highest synergistic effect in acrylamide reduction, which can reduce around 42% to 57% of acrylamide content at 3 concentrations among the selected probiotics.

About the Investigator

Hello, my name is Marco, 22 years old. I am a year 4 student studying a bachelor's degree in Food Science and Safety at the Technological and Higher Education Institute of Hong Kong. I had chosen a FYP topic related to food development, and the topic was "synergistic effect of probiotics bacteria to reduce acrylamide in food", guided by Dr. Emily Choi. I am interested in food development and hope to join a food development department in the future.

GREEK YOGHURT PRODUCTION ENRICHED WITH CITRI-FI AND ITS PRODUCT DEVELOPMENT

SO Hoi Man Joely
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Faculty of Science and Technology

ABSTRACT

RESEARCH BACKGROUND

Greek yoghurt is a well-accepted dairy product with many benefits for health concerned consumers. It provides a rich source of protein and calcium, it is low in carbohydrates, and can have a thick creamy texture. However, there are limited choices available in the market. Also, most are served as a snack and thus limits its application, for example, in cooking. In this research, soluble fibre, namely citri-fi, from citrus fruit is used for enriching the soluble dietary fibre in Greek yoghurt and improve its thickness for making a range of sauces with innovative flavours for dishes.

Objectives

The main purposes of this study are:

- to create an innovative Greek yoghurt enriched with citri-fi as the soluble fibre for improving its nutritional values and texture,
- to make use of its thickness and textural properties for making different flavours of Greek yoghurt sauces for meat dishes or bakery products, and
- to evaluate the acceptance preference of consumers at different age groups.

METHODOLOGY

The project composed of a literature review, online survey and a mini-scale production with several trial productions. The content of the questionnaire composed of 17 multiple choice and open-ended questions for collecting the respondents' views on their expectation of taste and flavours of Greek yoghurt sauces.

FINDINGS

An innovative Greek yoghurt with 0.5% citri-fi was found to perform optimal consistency for making four distinguish flavouring of Greek yoghurt sauces. The four flavours were black pepper, garlic, onion and chilli. The Greek yoghurt sauces can be tasted with meat dishes or bakery products. The results from the questionnaire showed that most of the respondents, at 87.8%, expected such newly developed sauce flavours become available. The two Greek yoghurt sauces most accepted by respondents was the black pepper flavour and the onion flavour.

About the Investigator

I am Joely So. Cooking and tasting delicious food is one of my interests. This project has allowed me to have many opportunities to explore in-depth and understand innovative food products with natural ingredients of citri-fi soluble fibre from citric peels. My project supervisor, Dr. FONG Lai Ying, Vicki, and I had many fruitful discussions, and she shared with me lots of constructive ideas throughout this study, particularly during this COVID-19 pandemic period. I hope I can work in the R&D department in the food industry after graduation, and I look forward to developing my career in a field that involves creating healthy and delicious foods.

NEW FOOD PRODUCT DEVELOPMENT WITH 3D PRINTED FOOD

TONG Wing Hei
BSc (Hons) in Food Science and Safety
Faculty of Science and Technology

Objectives

The objectives of this research are:

- to investigate the current food trends and eating problems of the elderly, and
- to formulate a range of mousse foods with various ingredients, such as spinach and tuna, etc., to improve the eating quality of the elderly.

ABSTRACT

RESEARCH BACKGROUND

The elderly generally faces chewing and swallowing problems which affects their ability to eat. It leads to malnutrition or dehydration. Texture modified foods are one of the significant factors. Mousse foods can be developed to improve the eating quality for the elderly. These new mousse foods can be produced with a 3D food printer, creating more food choices and a menu ideal to meet the nutritional requirement for the elderly and enhance their appetite.

METHODOLOGY

An online survey is conducted via an online link with 150 respondents. The survey mainly focused on evaluating the acceptance of mousse foods for consumers and their interests for purchasing the nutrient balanced product if it is available in the market. The expectation of mousse foods is also a concerning factor in this study. Besides the survey, experiments for a mini-production were conducted to develop a new kind of mousse food.

FINDINGS

A new mousse food was made with spinach and tuna. The ideal texture of the mousse food was to maintain the mousse-like texture but have little "jelly" texture in order to enhance the appetite of the elderly. Mousse foods are easy to prepare, which can help to relieve the pressure of caregivers. The most important factor is to fulfill the nutritional requirement for the elderly.

About the Investigator

I am Tiffany Tong. My interests in developing innovative products inspired me to do this project. Also, I have an elderly in my family who may face the same problem later. I hope this project can help more elderlies and solve a part of the prevailing social issues. Studying a Food Sciences subject has allowed me to express my interests. I want to work on product development after graduation.

FYP Supervisor: Dr Vicki Fong Lai Ying

BEAN-BASED MEAT PRODUCTION ENRICHED WITH CITRI-FI AND ITS PRODUCT DEVELOPMENT

WONG Tsz Ying
BSc (Hons) in Food Science and Safety
Faculty of Science and Technology

ABSTRACT

RESEARCH BACKGROUND

Until recently, choosing a non-meat diet can be due to various reasons, such as religion, being a vegetarian or have a healthy diet by preventing the consumption of animal protein. However, some people may want to taste the distinctive texture of animal meat even if they cannot eat meat. To achieve this expectation, citri-Fi (citrus fiber) will be considered as an indispensable ingredient to enhance the texture and provide a coherence function during the production process.

Objectives

The main purpose of the current study is to understand what plant-based ingredient is preferred to become 'the meat' by conducting questionnaires and experiments, and what the influences will be if citri-fi is used in plant-based meat production for the enhancement of texture and flavor.

METHODOLOGY

The literature reviews in this study came from research papers and journal articles from Science Direct and Google Scholar. A questionnaire with 18 questions was disseminated on social networking applications in April 2020 to collect data about respondents' knowledge and preference for plant-based burger meat and animal burger meat. Data analysis was conducted using SPSS and Microsoft excel.

EXPECTED FINDINGS

The results showed that ethical reasons, healthy impression, and the 'flavor' properties influenced consumers' expectation towards plant-based foods and their preference for some ingredients. In the study, citri-fi 100, 125FG and 200FG were tested in experiments for bean-based meat production. The results showed that citri-fi 200FG might be better used for enhancing food quality and increasing acceptance.

About the Investigator

I am Amber Wong. My interest is learning how to make people feel satisfied with different kinds of delicious food. Dr. Vicki Fong, my supervisor, gave me inspiration and useful advice in the planning stage of this project. I hope I can raise the attractiveness of vegetarian food in order to provide more food choices for people's daily meals. After graduation, I want a job related to food as fulfilling the expectations of eating is meaningful.

AUTHOR INDEX