

Recollection of **NIPAH VIRUS** Encephalitis outbreak: **20 YEARS AFTER**



**UNIVERSITY
OF MALAYA**



NOVEMBER

Nipah virus
... names scourge of the pig-farming industry

STAB
... MURALI
... MBAN: The virus which has
... led the pig-rearing industry and
... ved to have killed many people
... has a name.
... h is named after the village — Kam-
... h in Sungai Nipah — in Negri Sembil-
... where it was first detected by
... ersiti Malaya experts on March 18.
... nouncing the name yesterday, Health
... nister Datuk Chua Jui Meng said the Ni-
... virus, the first of its kind in the world,
... spected by Dr Chua Kaw Ping from
... Department

The national death toll stands at
92 including 15 from a pig farming
community in Ipoh where the out-
break was reported to have started
in November 1997. Another 59 pa-
tients are still in hospital.
Chua described the findings on
the Nipah virus as "a medical feat
for the country" because it took
only about four months to discover
the microbe compared to other dis-
eases like yellow fever, which took
about 500 years to determine.
He said the number of JE cases
had dropped since December, indi-

**T'S ALL
WAR**
... force comprising si

**UM RESEARCH
BULLETIN**

**Vol.19 No.1
2019**

Congratulations



WE CONTINUE TO RISE EVEN HIGHER



PREFACE

Last year, UM broke into the Top 100 Universities as ranked by the QS World Ranking 2019. Alhamdulillah, this year we are able to make progress, going from position 87 to position 70 in the QS World Ranking 2020. I would like to thank you everyone involved, either directly or indirectly, for your continuous support in making this achievements possible.

Being at number 70 is a testimony to UM's effort in raising the quality in her teaching, research and international collaborations activities. All the hard work put in by our researcher and staff are starting to bear some fruits. However, once again, I would like to iterate that ranking is not the ultimate goal for us. Ranking is only one of the outcome that helps us benchmark the fruits of our labours. The ultimate goal for UM, as the premier academic institution in Malaysia is to ensure high quality delivery in all our activities which will result in good, if not great impact to our society. We want to be the pride of the nation, much as Harvard is to the the United States of America or Cambridge and Oxford are to the England. So, ranking aside, let us continue of efforts and put in 100% into all our efforts and try as much as possible to overcome whatever challenges we face to ensure we will be (if we are not already), the pride of Malaysia.

Professor Dr. Noorsaadah Abd Rahman
Deputy Vice-Chancellor (Research & Innovation)

In June this year, besides celebrating Eid Mubarak, we rejoiced over the news that UM has risen yet higher in the QS World University Ranking 2020 to 70th position, the best ever achieved by a Malaysian institution. Thanks to the continuous support and effort from the UM community, we managed to uphold our identity as the nation's leading university not only in research, teaching and learning, but also in industry engagement and community empowerment. This is in line with the nation's aspiration to create a higher education system that enables Malaysia to compete globally and thus to become a renowned education hub. We will never be able to do so without your commitment and contribution.

We are happy to present to you our first issue of UM Research Bulletin for 2019. It showcases a wide range of interesting research happening in UM, from the memorial exhibition in conjunction with Nipah Virus encephalitis outbreak 20 years ago, to several PhD research projects including the national level 3-minute thesis 1st runner-up pitch on Building Information Modelling for Eco-Friendly Construction of Schools by Mr. Saznizam Sazmee Sinoh, supervised by Associate Professors Dr. Zainah Ibrahim and Dr. Faridah Othman of the Civil Engineering Department, Faculty of Engineering.

UM's achievement in high impact publications is testimony to the quality of our research, which we strive to uphold. And we would also like to see more research with real impact happening through translational research. Thus we strongly encourage you as academic researchers to engage with communities including industries to explore beyond the academic boundaries, and play active roles in solving real world problems. Not only will this enable you to get stakeholders input in conceptualizing research ideas but also open opportunities for external funding.

Wishing everyone all the best in keeping the UM flag flying high!

Professor Dr. Shaliza Ibrahim CEng FIChemE
Associate Vice-Chancellor (Research and Innovation)

EDITORIAL MESSAGE

Dear readers,

It is our pleasure to present the latest publication of UMR Bulletin (Volume 19, No. 1). Our goals are to create a platform for information exchange on all aspects related to research, covering the science and non-science research projects, as well as to encourage the dissemination of these knowledge to a broader audience. To achieve these, we strive to keep you updated on the current and continuous breakthroughs made by UM researchers, by giving you inside stories on their development and directions, plus introducing and highlighting our researchers and experts in each article.

Thus, we welcome you to submit original research write-ups with related images/photos of studies run by UM researchers. We hope that UMR Bulletin develops into a respected publication that is able to link external partners with our experts for any kinds of service or collaboration, that will ultimately enable us to transform our research into public consumption.

Our success entirely depends on your response. Thank you for providing us your continuous feedback and support.

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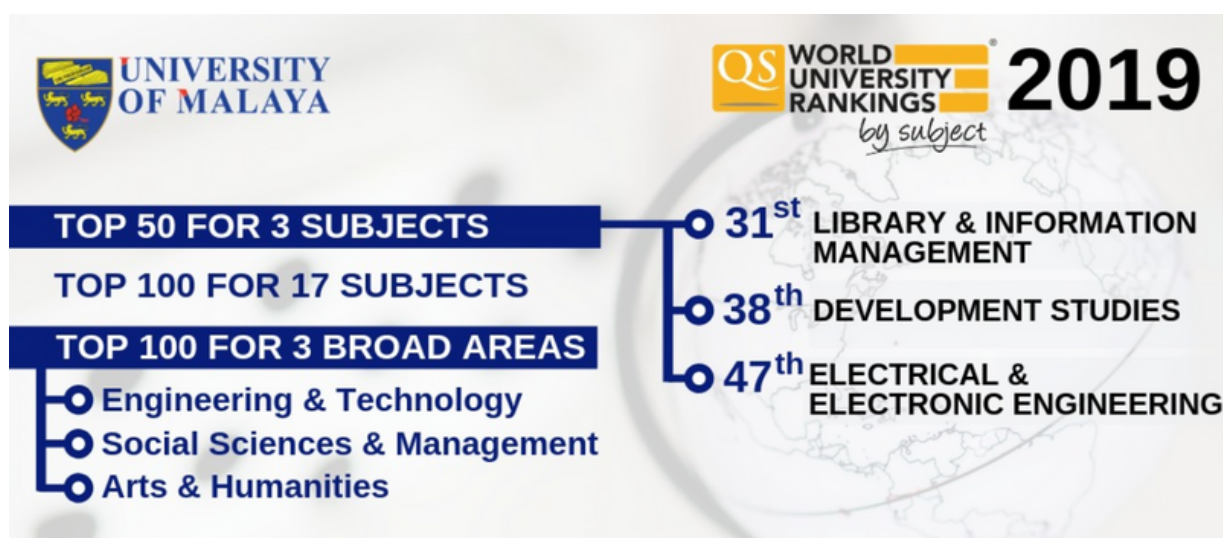
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WHAT MADE US TO THE WORLD'S TOP 50 UNIVERSITIES FOR LIBRARY & INFORMATION MANAGEMENT?

ASSOCIATE PROF. DR. NOORHIDAWATI ABDULLAH
FACULTY OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY



University of Malaya (UM) is ranked in the top 50, positioned 24th and 31st in 2018 and 2019 respectively in the QS World University Ranking (QSWUR) by subject for Library and Information Management.

The QS World University Rankings by subject are based on four indicators, namely academic reputation; employer reputation; and citations; and H-index, but mainly to reflect research work conducted in the field. This subject ranking primarily aims to assist prospective students to identify the world's leading schools in their chosen field.

The QS World University Rankings has expanded to include Library and Information Management as a subject in its league table for the first time in the 2018, with 50 institutions from across the world featured. Sheffield topped the table, coming joint first with the University of North Carolina, Chapel

Hill, USA in 2018. Subject ranking 2019 shows the University of British Columbia as the first and University of Sheffield as the second. UM is the only institution coming from a periphery country. Speaking about the achievement, The Vice-Chancellor said: "I am very proud that the UM has been recognised as the leading centre worldwide for research in this exciting and dynamic field."

The subject ranking highlights the leading research of the University of Malaya's Department of Library & Information Science (DLIS) which is based at the Faculty of Computer Science & Information Technology (FCSIT). Therefore it is logical to further view the research performance based on publications on the subject field from an indexed database. Publications used in the ranking exercise were based on Elsevier's Scopus database. Therefore, a total of 184 articles published from 2013 to 2018 were

gathered from Scopus. Out of this, 168 were articles, 8 were articles in press and 8 were reviews, with 1181 overall citations. The highest number of publication is in 2016 with 39 articles and 35 articles in 2014. The highest citation garnered is 127 from an article published in 2016 in International Journal of Information Management entitled The role of big data in smart city. Figure 1 shows the number of articles published by University Malaya in Library and Information Management subject field.

University of Malaya	Articles	Citation
Faculty of Computer Science and Information Technology	139	850
Faculty of Business and Accountancy	15	125
Asia-Europe Institute	11	103
Faculty of Science	8	54
Faculty of Languages and Linguistics	6	70
Faculty of Education	5	16
Faculty of Engineering	4	36
University of Malaya Library	4	29
Faculty of Arts and Social Sciences	4	4
Faculty of Medicine	3	18
Institute of Research Management and Monitoring (IPPP)	3	6
Faculty of Economics and Administration	2	15
Faculty of Law	2	0
Faculty of Dentistry	1	5
Academy of Islamic Studies	1	3

The 184 papers were affiliated to various faculties across University of Malaya, predominantly from the Faculty of Computer Science and Information Technology (139 papers) followed by Faculty of Business and Accountancy (15 papers) and Asia-Europe Institute (11 papers) respectively. 32 articles were affiliated with other public and private universities in Malaysia that shows collaborative research work at the national level.

When further analysed at the micro (department) level for the papers affiliated to the Faculty of Computer Science and Information Technology, findings show that the major contributor came from the Library and Information Science (LIS) indicated (93 papers, 62 per cent) and the other 57 papers came from the other four departments, with significant contribution from Information Systems. These articles were shown as

collaborative research work of LIS and other departments from the faculty at some point.

Table 1 shows the top 10 journal titles that published articles on Library Science and Information Management subject area affiliated by University of Malaya that makeup 20 per cent of the total 195 journal titles in SCOPUS. The highest number of articles were from Malaysian Journal of Library and Information Science ranked in Q2 in SJR with 31 articles, followed by Scientometrics, ranked

Department	Articles	Citation
Library and Information Science	93	404
Information System	25	131
Artificial Intelligence	15	135
Computer System and Information Technology	12	261
Software Engineering	5	14

*The data consists of overlapping publication from various departments of FCSIT

Figure 1: No of Articles in Library and Information Management Subject Field

Q1 in SJR with 22 articles. When compared to Journal Citation Ranking by WOS, the articles were also published in the higher ranking journals of Q1 and Q2.

The data indicates that the journey to the top 50th subject ranking is not a solo journey, but it is a collective effort from other related fields especially information systems that contribute to the information science discipline that is becoming more interdisciplinary. Assoc. Prof. Dr. Noorhidawati Abdullah, head of the department remarked, "For many years we have had a worldwide reputation for the quality of our research and teaching and we are very pleased that this has been recognised in the QS rankings. These rankings reflect our outstanding academic reputation established over two decades, our excellent reputation among employers, our strong contribution to research publications and the number of citations our papers achieve, as well as the

Table 1: Top 10 Journals Titles

No.	Journal Title	No. of Articles	SJR (Scopus)	JCR (WoS)
1	Malaysian Journal of Library and Information Science	31	Q2	Q4
2	Scientometrics	22	Q1	Q2
3	Information Development	13	Q1	Q3
4	Electronic Library	12	Q1	Q3
5	International Journal of Information Management	11	Q1	Q1
6	Aslib Journal of Information Management	7	Q1	Q2
7	International Journal of Information Science and Management	6	Q4	-
8	Journal of Academic Librarianship	6	Q1	Q2
9	Journal of Librarianship and Information Science	5	Q1	Q3
10	Serials Review	5	Q3	Q4

impact of our research outside of the academic community."

Prof. Dr. Abrizah Abdullah added: *"Our research fundamentally explores the power of information in the digital world, and examines how individual, organisations and society use information to shape and influence our increasingly dynamic and complex world. The department has excellent well-established research that has been developed over 20 years, for example in scientometrics, digital libraries, information behavior and scholarly communication. Our new areas of research have emerged from rapid advances in the information world, such as in data science, health informatics and digital humanities. We would love to move to artificial intelligence in libraries soon".*

UM's position in the ranking further cements its international reputation for high quality, innovative learning and teaching, delivered by staff who are committed to providing an outstanding student experience.

When asked what made us at the top 50 in Library and Information Management, the members of the DLIS believe that:

- "we made the right decision to focus publishing our precious research in the right journal – journals in our very own subject discipline, that is library and information science" (Prof. Dr. Abrizah Abdullah)
- "mandating publishing in WoS-indexed journals has its merit. Most of these journals are indexed in Scopus as Q1 and Q2 in terms of impact" (Assoc. Prof. Dr. Kiran Kaur)
- "Having a national journal that has an international standing in global citation databases such as Web of Science and Scopus helps us a lot in shaping our academic reputation" (Dr. Yanti Idaya Aspura)
- "research will not be complete until we publish and disseminate our findings to an audience of similar interest, we publish our research in journals of quality" (Mr. Ali Fauzi)
- "we conduct research and publish in cutting edge topics to keep abreast of the new advancements and technologies" (Dr. Noordiana Ahmad Kharman Shah)
- "the journey to the top 24th subject ranking is not a solo journey but it is a collective effort from other related fields especially information systems that contribute to the information science discipline that is becoming more interdisciplinary" (Assoc. Prof. Dr. Noorhidawati Abdullah).

MYDAUN: ARTIFICIAL INTELLIGENCE IN TROPICAL PLANT SPECIES IDENTIFICATION



DR. CHANG SIOW WEE
FACULTY OF SCIENCE

Plants play an important role in our life as essential resources for foodstuff, medicine, and industry. Plants are vital for environmental protection as well in optimizing the ecosystem. According to The State of the World's Plants report in the year 2016, there are currently 391,000 vascular plant species which are known to science. Hence, it is impractical for a botanist to be able to recognize all of the species. Moreover, some plant species might have high similarity in between each other, which is time-consuming for botanists in differentiating these species. Therefore, it is necessary to develop a computerized or automated system to resolve these matters.

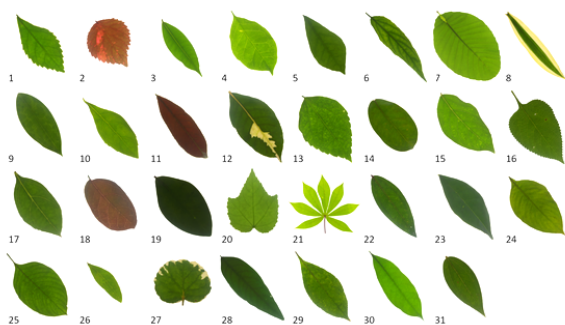
myDAUN is a pilot development in applying artificial intelligent techniques in tropical plant species identification. The main aim is to develop an automated tropical plant species identification system that could help botanists as well as the general public in identifying plant species speedily and structurally in the era of biodiversity 4.0.

Currently, the myDAUN database contains 88 tropical plant species, with 45 species of tropical shrubs and 43 species of tropical

trees. All samples were collected within the campus of the University of Malaya. A prototype of an automated tropical plant species identification system based on leaf morphological approach and deep learning approach was developed.

First, a leaf image of an unknown species is uploaded onto the system. Next, a user can select the recognition methods, either via leaf morphological approach or deep learning approach (D-Leaf). Following that, the extracted features from the selected method are classified and the species of the uploaded image can be identified with the use of artificial neural network (ANN) classifier. Besides, the user could view the whole tree, leaf, bark, flower and fruit images of the selected species.

The developed prototype is feasible to assist and aid the botanists and the general public in identifying unknown leaf samples. It is hoped that the automated system could increase the interest of the public especially the young generation in the botanical study in contributing towards the conservation of tropical biodiversity.

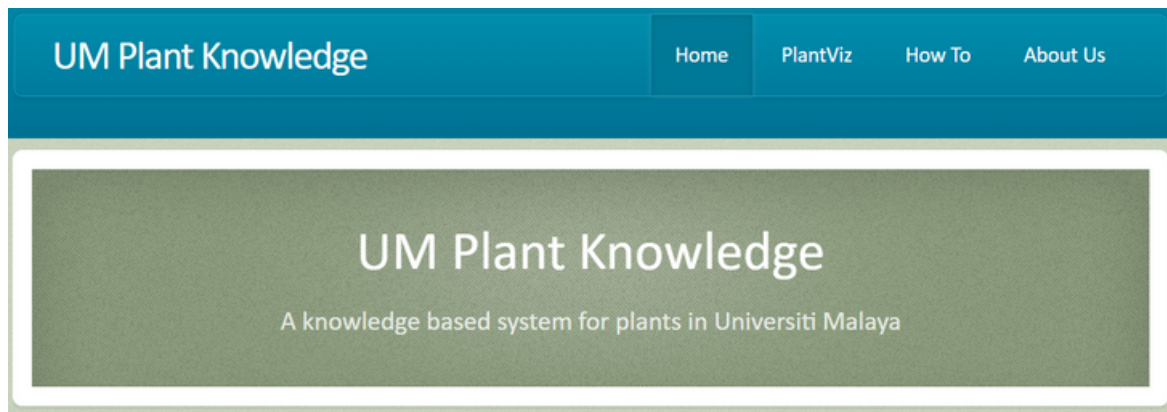


Copyright: Murat, M. et al., 2017



PLANTVIZ – A TOOL FOR PLANT KNOWLEDGE RETRIEVAL

DR. ARPAH ABU
FACULTY OF SCIENCE



UM Plant Knowledge is knowledge-based system for plants in University of Malaya. It consists of POUM (ontology-driven **Plant Ontology Universiti Malaya**) and PlantViz (**Plant Visualisation** system).

POUM consists of plant data and image of 222 plant samples from 43 species of 42 genus for trees and 31 species of 28 genus for shrubs that were collected in few areas in University of Malaya in year 2017. Ontological data for plants and samples of trees and shrubs is then integrated into the PlantViz. PlantViz provides a graphical user interface that enable users to query the POUM and a graphical viewer to display the results of the query in a form of network graph. The relationships between the data were shown in visualisation form that enables the users to infer the knowledge and correlation between the data easily.

This UM Plant Knowledge is suitable for the expert users such as Botanists and Researchers and also the novice users, with or without computer skills.

This project is supported by the University of Malaya Research Grant (RP038B-15AET).

Plant data is heterogeneous, containing complex pictures and consisting of many terminologies that describe plants typically in textual and image forms. The advancement in information technology has led to the development of online database systems, through which the plant data can be shared; accessed and related information to the users' query be retrieved. However, the retrieved plant data are often presented in lengthy textual and table forms. Consequently, there is inefficiency in elucidating the relationships between plant data in which obtaining new insight from the presented data can be difficult to the users. It should be emphasized that underlining the relationships between data are very important for knowledge enrichment.

PlantViz (**Plant Visualisation**), a visual-based representation was developed to display data to the users in a meaningful way, as it emphasizes the relationships between the data. In this prototype, plant data from POUM (**Plant Ontology University Malaya**) was embedded into PlantViz. POUM consists of plant data and images of 222 plant samples from 43 species of 42 genus for trees and 31 species of 28 genus for shrubs collected around the University of Malaya. PlantViz provides a graphical user interface for users to query the POUM and a graphical viewer to display the results of the query in a form of network graph. The relationships between the data are shown in visualisation form so that users can infer the knowledge and correlate between the data easily.

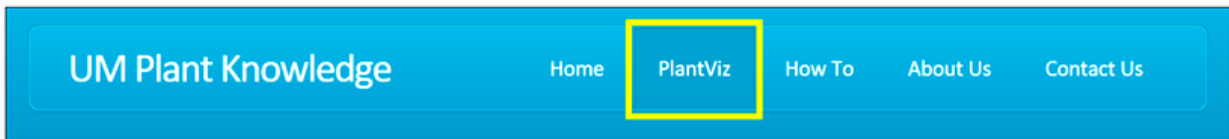
PlantViz is probably the first Malaysian plant database that providing data visualisation with interactive features. It offers a more effective technique in improving data interpretation and analysis. Graphical data presentation allows users to view the data as a whole without any cluttering of texts. The interactive features such as expand or shrink a group node and highlight the link between nodes, allow users to explore the visualized data dynamically.

PlantViz was tested by the expert and novice users and it show that the PlantViz is suitable for both users, with or without computer skills. This technique demonstrated the practicability of using computer-assisted tool by providing cognitive analysis in understanding the relationships between data. Currently, PlantViz is freely accessible at <http://103.18.1.10:8080/plantviz/>.

HOW TO USE PLANTVIZ

To use the PlantViz, click on the **PlantViz** tab.

PlantViz provides a graphical user interface that enable users to query the POUM and a graphical viewer to display the results of the query in a form of network graph. The relationships between the data were shown in visualisation form that enables the users to infer the knowledge and correlation between the data easily.



i. View the label of the nodes

The purpose of this feature is to allow user to view the label of the nodes.

1. Hover the cursor on the ● node.
2. Hold the cursor until the label on the node is appeared.
3. If the label does not appear, click on the ● node and hover it again.

Note: The other nodes may also have labels

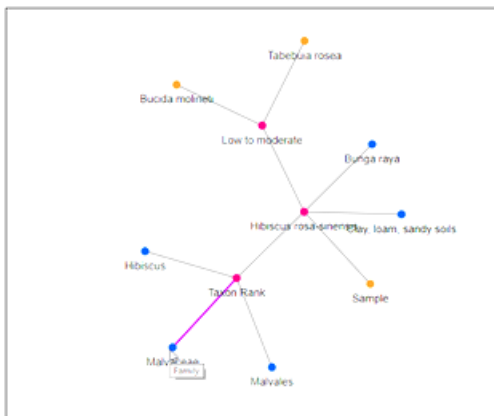


Figure 1

3. Expand and shrink the network graph

The purpose of this feature is to avoid cluttered nodes in the network graph. It also helps users to focus on a part of the presented data.

1. To expand or shrink the network graph, double click on the ● node
2. To shrink the graph, double click on the ● node



Figure 3 - Shrinking the network graph

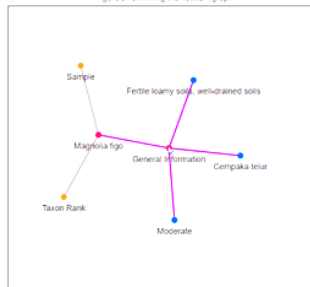


Figure 4 - Expanding the network graph

2. Highlight the nodes

The purpose of this feature is to show relationships between the data.

1. Hover the cursor on any node
2. The links that connected the nodes will be highlighted in purple colour

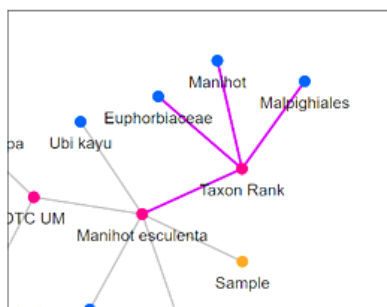


Figure 2

4. View the thumbnail images of plant sample

The purpose of this feature is to view the thumbnail image(s) of some plant sample(s)

1. Hover the cursor on the node with the sample ID.
2. A popup with thumbnail image(s) will be appeared.

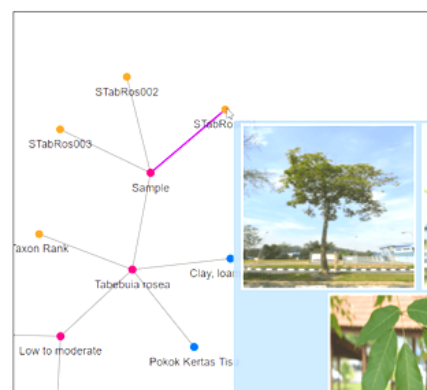


Figure 5

AGEING AND RETIREMENT: PERCEPTIONS AND EXPECTATIONS AMONG MALAYSIANS

PROF. DATUK NORMA MANSOR
SOCIAL WELLBEING RESEARCH CENTRE (SWRC)



As a result of declining fertility and increasing life expectancy Malaysia is currently experiencing steady increase in the proportion of older people relative to the total population. The number of Malaysians aged 60 years and above is projected to reach 3.5 million in 2020 and 6.3 million in 2040 which is about 20% of total population. A report by Department of Statistics Malaysia (DOSM), 2016 shows that a male aged 65 in 2016 could expect to live to age 80 years and a female expected to live to age 82 years.

However, what is the psyche of the Malaysians with regards to life expectancy? How long do they think they are going to live? Ageing can entail multiple losses, including loss of work and physical functioning. How prepared are we in meeting our health and financial obligations in later life? Greater life expectancy means individuals must either delay his/her retirement and work more years, save more while working and have lower consumption in retirement.

A Genworth survey on Americans (2010) found that Americans would ideally like to 92

years old. Our centre (SSRC) conducted a survey to gain insights into the psyche of Malaysians, targeting males and females aged 40 years and above. Of 518 Malaysians who responded to the survey, almost all indicated that they would like to live to at least 80 years. Yet, many are not self-assured financially about having a comfortable life throughout their retirement years. Only slightly half of those surveyed are confident of having a comfortable life while the rest are not very optimistic. A majority of those who feel certain about having a comfortable post-retirement life are professionals, whereas non-professionals are less assured.

Seventy percent of those surveyed said they would expect to live between 6 to 20 years more after attaining the age of sixty and will continue working as long as their mental and physical capabilities permit and that there should not be mandatory retirement. Working until older ages is one of the most efficient methods for many individuals to finance increased number of years in retirement. Thus, one can expect that many individuals will have a preference for working until older ages.

In preparation for post-retirement, respondents indicate their plan to boost their savings by reducing current expenses and reduce their cost of living in retirement. A quarter of the respondents intend to move to cheaper location, while others would turn to family members for assistance or consider living in assisted living facility such as a

retirement village, while a good number of respondents said they would turn to government for old age support.

Governments however face funding challenges in supporting retirement programs. In a recent development, our government foresees expenditure on retirees to surge to RM100 billion by 2050 due to longer life expectancy and the surge in number of civil service retirees whose pensions are not contributory. Currently only 80% of the total 13.5 million employed labour force in Malaysia have some form of retirement savings and government pensions although government pensions are not contributory. Perhaps government has to review the public pension scheme as a contributory one would provide protection for all Malaysians. Rising expenditures on pension payments would put a strain on government's fiscal position. While at the same time declining birth rate and longer life expectancy could give a huge impact to the country's competitiveness and productivity level and the cost of healthcare.

It is indeed a tricky balancing act with wide implications on public policy which includes social security, healthcare insurance, expenditures and taxes. Thus the issue requires concerted effort by both public and private sector. Countries including Singapore, Japan, Canada, Australia and the United Kingdom have introduced various subsidy programs to incentivize employers to hire older workers such as special employment credits, federal-state cost-shared programs and wage subsidies for older workers seeking return into the job market.

Since financial issue is an important reason for retirees to return to the labour market, employers should consider offering "bridge jobs" either full-time or part-time as an extension of current work that helps ease worker's transition into retirement. In Singapore for example, the Special Employment Credit (SEC) was introduced in

2011 to support employers and to raise the employability of older Singaporeans workers and persons with disability. The SEC provides wage-offset to employers hiring Singaporean workers aged 55 and above. Although the retirement age in Singapore is 62, workers can opt to retire or continue working until the re-employment age ceiling of 67. In Australia, the Wage Subsidies for Matured Age Job Seekers (RESTART) employers can receive up to \$10,000 depending on eligibility for a full time employee. In Japan where 25% of the population are over the age of 65, and people in this age category are expected to rise to 40% in 2060. The Japanese government provides various subsidy programs under the "Law for Employment Stabilization for Older People" to employers who either continue employment of existing older workers or who hire older persons.

Going forward, there can be no doubt that the Malaysian workforce of the future will be older than it is today, and organisations need to think now about how they deal with that change in a way that is appropriate for the industries they are in and the occupations they employ. Although not all of the answers can be found in the existing research, but there are certainly a number of issues that arise from studies, academic or otherwise that can help organisations start to think more strategically about the role of their older employees.

Workers too have to be willing to continually upgrade their skills and undergo retraining. Post retirement jobs may entail a different nature of job, which one may even find interesting. On the issue of employing people post-retirement, there are labour matters involved and the Centre is working on a blueprint for ageing and how to prepare for it in Malaysia. Deeper understanding of the issues entails developing human resource systems that are appropriate for an age-diverse workforce as the number of older workers grow.

HERICIUM ERINACEUS A MEDICINAL MUSHROOM FOR HEALTHY GAIT AND BALANCE

DR. WONG KAH HUI
FACULTY OF MEDICINE



Cerebellar ataxia is a progressive neurodegenerative disease, which means they gradually get worse with time, and characterised by slurred speech, gait instability, limb rigidity, and difficulties in motor coordination. Acquired ataxia is caused by vitamin deficiencies, prolonged exposure to high levels of alcohol, damage to the brain caused by stroke, tumour, viral infection or head injury. At present, a potassium channel blocker, 4-aminopyridine (4-AP) constitutes the most promising treatment. However, it has several potentially side effects, most noteworthy of which are seizures. On the other hand, Friedreich's ataxia (FRDA) is the most common type of inherited ataxia, mostly affecting children and teenagers and the signs and symptoms begin before 15 years of age. It is associated with heart problems (cardiomyopathy), diabetes or curvature of the spine (scoliosis). There is some evidence of beneficial effects of vitamin E and coenzyme Q10 in FRDA. The constant issues of synthetic

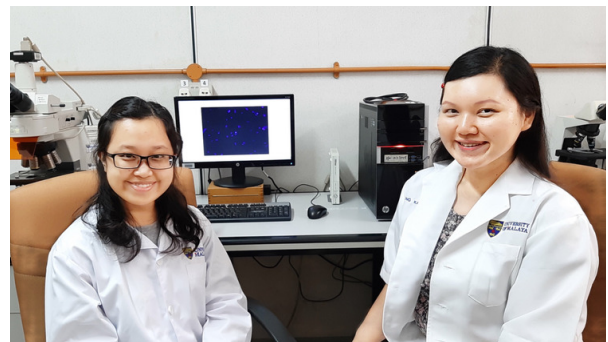
modern medicine have acquired many to opt for alternative and complementary medicines.

In our current research, we focus on developing the concepts and mechanisms for culinary and medicinal mushrooms in delaying the progressive symptoms of cerebellar ataxia. *Hericium erinaceus* is a temperate mushroom that requires cool temperature to produce fruit bodies. However it has been successfully domesticated to tropical climate of Malaysia since year 2000 and therefore making it possible for Ganofarm R&D Sdn Bhd, with whom we have maintained close relations for two decades, to produce fresh mushrooms and manufacture a standardised extract of *H. erinaceus* (NevGro) throughout the year.

The dynamic team of researchers led by Dr Wong Kah Hui of Department of Anatomy, Faculty of Medicine, UM and Asst. Prof. Dr. Lim Lee Wei of School of Biomedical Science,

Li Ka Shing Faculty of Medicine, University of Hong Kong, are actively involved in a wide range of basic and translational research areas. The team from both institutions armed with genuine collaboration with Ms. Cheng Poh Guat, the Chief Executive Officer of Ganofarm R&D Sdn. Bhd., explores the potential use of *H. erinaceus* to effectively prevent symptoms of cerebellar ataxia. Our collaboration with the University of Hong Kong allows comprehensive investigation on the mechanisms that are responsible for the improvement of motor coordination following induced cerebellar damage and treatment by *H. erinaceus* in an in vivo model. We are optimistic that consumption of *H. erinaceus* may lead to breakthroughs in delaying the progression of cerebellar ataxia.

We also engaged with Friedreich's Ataxia Research Alliance (FARA) and UAB Stem Cell Institute, University of Alabama School of Medicine to pursue scientific research leading to treatments and a cure for FRDA. We are grateful to these international partners who have provided us fibroblasts from FRDA patients free of charge. *Hericium erinaceus* is beneficial in attenuating oxidative damage in the fibroblasts. The mushroom acts as a potent protector against oxidative damage-induced fibroblast death and could be a possible therapeutic for delaying the FRDA symptoms. The observed effects were better than idebenone, a lipid antioxidant that has mild adverse effects. Additionally, the cellular model is an important tool for the discovery of novel therapeutic approach in FRDA in which reactive radicals and oxidative damage are involved.



FINANCIAL LITERACY AMONG YOUNG WORKING ADULTS IN MALAYSIA

PROF. DATUK NORMA MANSOR
SOCIAL WELLBEING RESEARCH CENTRE (SWRC)

Financial literacy is important in the current complex and dynamic business and economic world because individuals with higher financial literacy is always at an advantage and are more empowered compared to others. Studies reveal that if a nation is equipped with strong financial literacy, the inequality between ethnic groups can be minimized. Hence researchers would like to explore the relationship between financial knowledge, attitude and behaviour among young working adults. A conceptual model based on theory of planned behaviour has been developed to investigate the financial literacy of an individual via two alternative paths. Simple random sampling recruited 1915 respondents from Klang Valley in Malaysia comprising 57.2% of Malays followed by 31.5% of Chinese and 9.2% of Indians which is proportionately consistent with the national population statistics. More than half of the respondents belonged to the age of 21-30 who are working as managers, professionals, technician etc. The gender composition was 58% of female and 42% of male. Data were analyzed using structural equation modelling (SEM) with SPSS and Smart PLS software packages. Mediating effect was investigated using bootstrapping technique.

The research instrument had separate sections for each construct; which are financial education, financial knowledge scale, financial attitude and financial behaviour. Under financial behaviour, four perspectives as how much the expenses were also monitored, namely saving behaviour, planning for old age and unexpected expenses, budgeting and behaviour of not over spending and living within means. These components were constructed based on previous studies as well as self-developed by the authors.

The full mediating effect of financial attitude on the relationship between knowledge and behaviour emphasizes the importance of improving the attitude on financial matters, especially to prevent themselves from being impulsive and to have an achievement orientation in terms of finance. Chinese are





found to possess the highest financial knowledge followed by Malays and Indians. Even though previous studies proved that there is no age difference in financial knowledge among working adults in Malaysia, the current study found that working adults at the age of 26-30 possess the highest financial knowledge with significant difference with other age groups. Surprisingly it was found that financial behaviour is not a strong predictor of financial literacy among young working adults in Malaysia, resulting future studies to investigate on other possible intervening variables.

As the relationship between knowledge and attitude is significant, financial education programs must generate sufficient financial knowledge for young adults for them to have correct attitude. Since the indirect relationship between knowledge and behaviour through attitude is higher than the direct relationship, it should be understood the importance of

attitude in building financial literacy among Malaysians. Families, educational institutions should work hand in hand to up bring youngsters with correct attitude in that aspect. Moreover, young working adults must be educated on the importance of setting long term financial goals, monitoring expenditure, planning for old age and be prepared for unexpected expenses. Further, relevant authorities have to take initiatives to make it freely accessible to financial advises and counselling services for young working adults when they seek so. Meantime the finding on the importance and the influence of attitude on overall financial wellbeing of a country must be well communicated to the independent financial counsellors and advisors for them to make their service fruitful. Meanwhile, the financial education programs should be designed in a way that those create a higher financial knowledge to individuals and thereby result in accepted financial behaviours.

GASTRONOMY, TOURISM, AND THE SOFT POWER OF MALAYSIA

ASSOCIATE PROF. DR. HANAFI HUSSIN
FACULTY OF ARTS AND SOCIAL SCIENCES



There are two facets to power: soft and hard. Joseph Nye has defined power as the ability to affect the behaviour of others to get what one wants. Joseph Nye also coined the term 'soft power' in a 1990 book titled 'Bound to Lead: The Changing Nature of American Power'. Soft power is a country, institution, or person's ability to achieve the desired results through attraction, whereas the hard power tool is about the application of coercion and payment. After the emergence of soft, hard, and smart power approaches, the researchers have focused on tourism and its associated areas such as food, culture, diversity, and economic growth.

Four interlinked ways to examine the relationship between soft power and tourism were proposed by Ooi in the Encyclopedia of tourism published by Springer in 2016. They are: (a) Tourists develop greater and more profound understanding, and empathy of the destination country and tourists get more familiar and become fond of the place; (b) It becomes a prime mandate of the tourist

authorities to portray a very attractive image of the country and its places to the global audiences. Such representation entails strong glorifying images of the destination to counter the negative images; among the soft power tactics, destination branding becomes more effective; (c) Big events such as world symposiums, expositions, and games are arranged to garner geopolitical support. The events play an important role to attract tourists and show the capacity and capabilities of the country; (d) The foreign tourists bring the message of their countries and this way they change the stereotypes established against the other countries.

This article is to first study the adequacy of four interlinked ways (areas) proposed by Ooi in assessing and understanding the relationship between soft power and tourism and secondly to examine the effectiveness and influence of Malaysia's use of food within the tourism and traditions and cultures as soft powers tools in influencing the audiences at local and international level based on the

areas proposed by Ooi. Researcher will also examine the relationship between soft power and tourism based on the four interlinked ways (areas) proposed by Ooi and gastronomy as a soft power resource via a case study and data from secondary sources.

All interlinked areas are relevant to study the links between the two. However, the review indicates toward a vast area of other concerns ignored by Ooi that include the independent role of gastronomy (especially traditional and Muslim food), the business enabling environment, recognition of the cultural and natural sites as the world heritage, and methodological approach to address negative stereotypes against other nationalities. The additional challenge in this study was to examine the role of soft power, especially in the context of tourism as an independent tool in achieving the desired economic outcomes. Researcher found that Malaysia has efficiently used soft power approach and maximally received benefits from it. Malaysia used its resources to promote tourism, culture, food heritage, and halal food and has used slogans to attract and influence the global audiences not only in the western part of the world but also the Muslim population around the globe. Malaysia has applied great slogans like "Malaysia Truly Asia" and uniquely presented its image and won hearts of millions of tourists and investors, which kept the flux of tourist higher and higher; and each year, the number of tourists increased. As mentioned earlier, in 2016, the tourism sector was the third largest contributor to the Malaysian economy. This study also found that with good and genuine presentation and application of soft power tools such as diverse cultures, unique traditions, multiethnic, multireligious, and tolerant society, a country could bring maximum benefits, but the country must invest in it. Malaysia is aiming to invest more and hoping to receive 36 million tourists by 2020.

This study maintains that for attaining the desired outcomes, the effective (or smart) use of only soft power tools is adequate, and Malaysia has relatively achieved the outcomes of development and tourism boom through the effective application of its only soft power tools. Over the last three decades, Malaysia has not applied coercive or hard powers against its neighbours as the United States has done across the world. Rather Malaysia has applied the soft power approach smartly without combining the hard power approach for the preferred outcomes.

This study agrees to Smith-Windsor's journal article on Hard power, soft power reconsidered published by Canadian Military Journal in 2000 that the application of hard power on other countries and landscapes is vague and inapplicable, and better to be left behind. Smith-Windsor claimed that hard and soft powers have originated from America did not fit into the other countries' political settings. However, researcher argues that the soft power concept could be applied in any of the political and cultural settings in the world, including in Malaysia. This study concludes that Ooi's four ways and also gastronomy are adequate (ways) to examine and analyze the relationship between the country's soft power and tourism. In other words, Ooi's approach is the best way to maximally explore tourism policy, approaches, strategies, tourists' perceptions, the impact of tourism on communities, and other interlinked areas which support international tourism. This exploratory research offered insight into different power resources and tools applied in a variety of matters and contexts which shape the image of countries. It also emphasized that all possible areas of power should be assessed to provide a clear picture of the image building through soft power gastronomy and tourism approach.

RECOLLECTION OF NIPAH VIRUS ENCEPHALITIS OUTBREAK: 20 YEARS AFTER

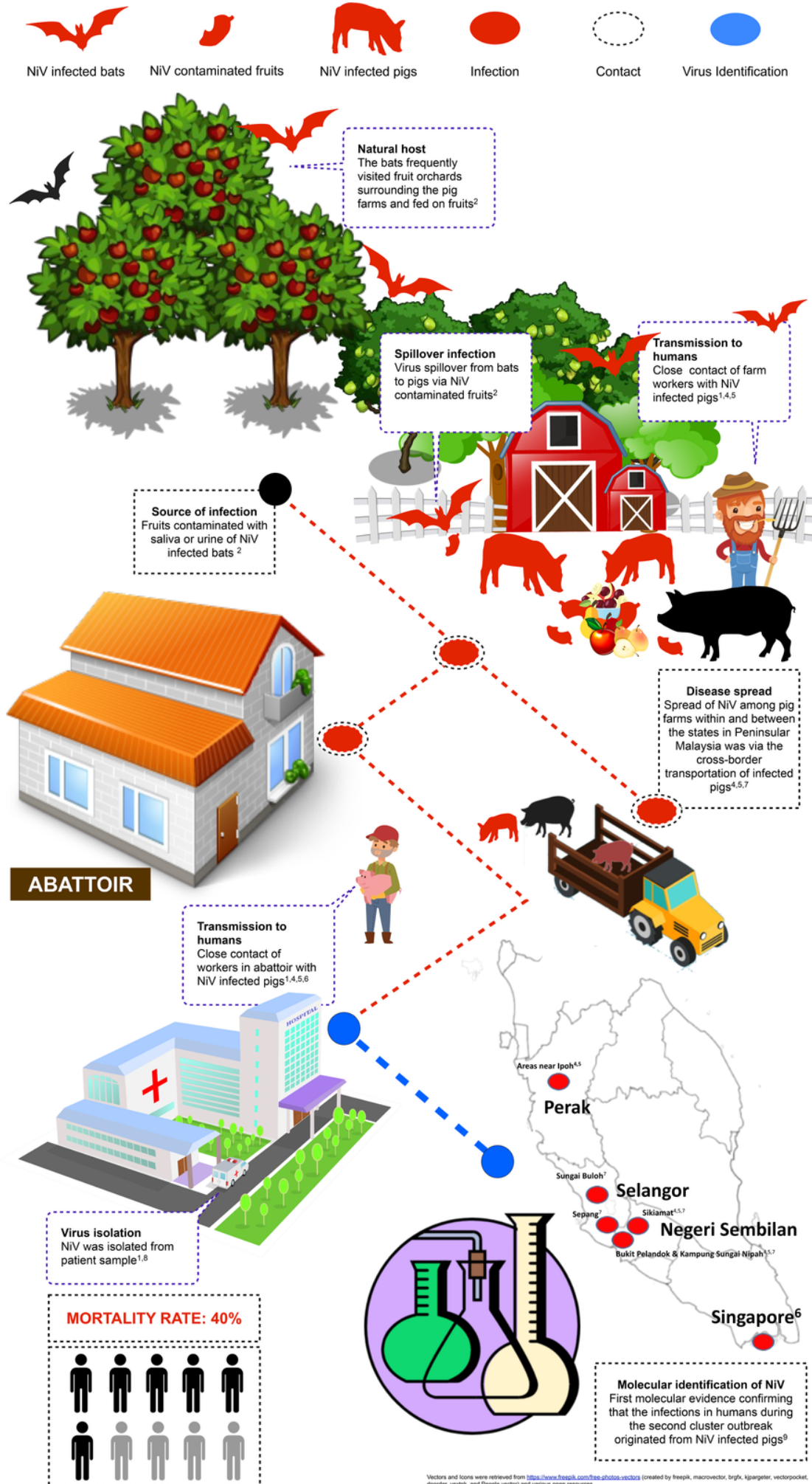
PROF. DR. SAZALY ABU BAKAR
FACULTY OF MEDICINE



20 years ago, an outbreak of encephalitis and respiratory illness among pig farmers and people with close contact with pigs in Malaysia. In the outbreak, nearly 300 human cases with 105 deaths was reported. The virus was then isolated and identified during the outbreak and was named Nipah virus (NiV) after Sungai Nipah, a village in the Malaysian Peninsula where pig farmers became ill with encephalitis. The NiV virus identified in this outbreak appeared to have been transmitted initially from bats to pigs, with subsequent spread within pig populations. The humans were then infected with virus due to close contact with infected pigs. However, no human-to-human transmission was reported in this outbreak. The initiatives taken by Malaysian government including culling of 1.1 million pigs have prevented further major outbreak of the disease in the future.

A memorial exhibition in conjunction with the 20 years since the occurrence of the NiV virus encephalitis outbreak was hosted through joint effort between Tropical Infectious Diseases Research & Education Centre (TIDREC) and the University of Malaya Art Gallery. University of Malaya also collaborating with the New Straits Times Press (Malaysia) Berhad and the Sungai Nipah Time Tunnel Museum in this event to exhibit media materials such as photographs, video clips and newspapers cutting which had been recorded and published during the 1997-1999 outbreak. The memorial was held from 5th of March to 30th of April 2019 at UM Art Gallery where selected personal collections donated by individuals as well as the family members of victims were on display.

How 1998-1999 NiV encephalitis outbreak started



Vectors and icons were retrieved from <https://www.freepik.com/free-vector/animals> (created by freepik, macrovector, brgfx, kjaipeter, vectorpocket, doordie, vevak, and People vector) and various open resources.

EMPOWERING PARENTS OF CHILDREN WITH SPECIAL NEEDS: A UNIVERSITY OF MALAYA COMMUNITY ENGAGEMENT INITIATIVE

DR. DONNIE ADAMS A/L PARAMASIVAM
FACULTY OF EDUCATION

Children with special needs barely experience nature learning, especially after school due to parents' lack of knowledge on how to help their children in a simple and cost-effective way. Therapies for children with special needs are often expensive and parents has no expertise to conduct these therapies themselves. Therefore, parents often leave their children with special needs at home.



The Community & Sustainability Centre (UMCares), University of Malaya organized a 'Workshop on Ecotherapy: Nature-Based Learning and Play for Children with Special Educational Needs'. 4 national primary schools, 73 Parents and children with special educational needs and 25 special educational needs teachers were selected for this workshop series.



The projects' leads, Dr. Donnie Adams, Institute of Educational Leadership, Faculty of Education, UM, and Associate Professor Dr. Aznan Bin Che Ahmad, School of Educational Studies, USM said the project aimed to provide exposure to parents with special needs children on the techniques and activities of Ecotherapy, and how parents will be able to help their children in the aspect of emotions, behavior, confidence, psychomotor and social skills.



This project focuses on delivering effective techniques and activities of ecotherapy focusing on gross and fine motor skills to parents via 'hands-on' while being monitored by expert trainers. It is aimed to expose parents on the ecotherapy techniques for their special needs children so that it can be practiced at recreational parks and botanical gardens. The ecotherapy for your child with special needs book was published and sponsored free for parents with special educational needs children in this workshop. This book included information on the types of special needs, step to step pictorial guide on effective ecotherapy techniques focusing on gross and fine motor skills. Further information on the project can be obtained through the QR Code below.



BUILDING INFORMATION MODELLING FOR ECO-FRIENDLY CONSTRUCTION OF SCHOOLS

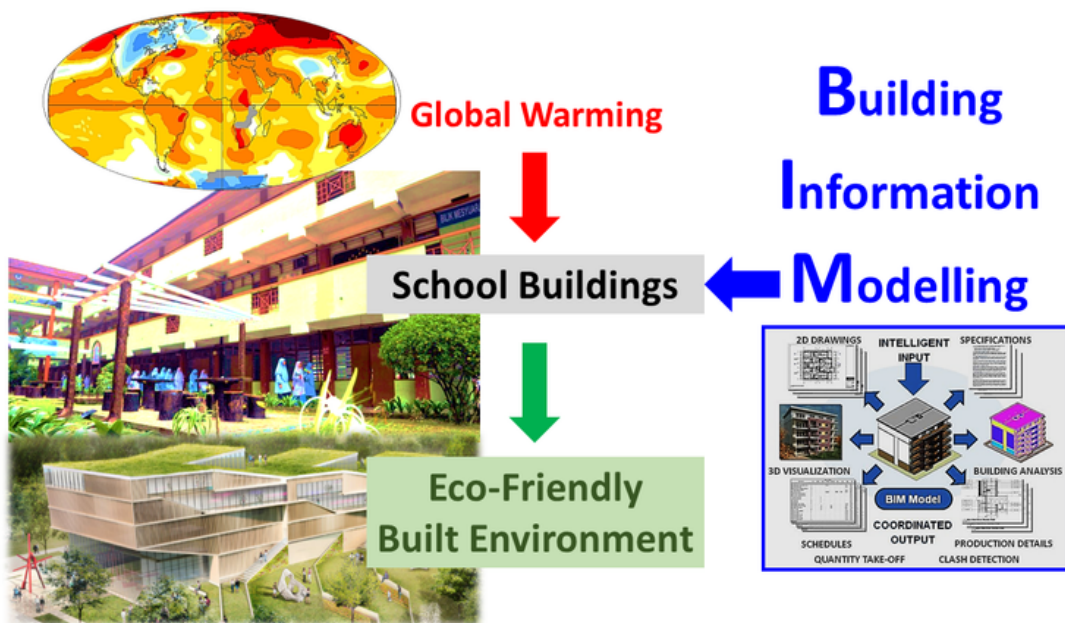
(1st Runner-Up for Engineering Category in National Level 3-Minute Thesis Competition)

SAZNIZAM SAZMEE SINOH, FACULTY OF ENGINEERING

ASSOCIATE PROF. DR. ZAINAH BINTI IBRAHIM, FACULTY OF ENGINEERING

&

ASSOCIATE PROF. DR. FARIDAH BINTI OTHMAN, FACULTY OF ENGINEERING



Construction is important for the development of human civilization, yet it is also one of the leading causes of human-linked global warming. This is mainly due to the use of concrete of which cement and natural aggregates share a high proportion of the environmental burden. The energy intensive manufacturing process for cement accounts for more than 5% of all man-made carbon dioxide. In addition, unsustainable mining activities to extract gravel and sand for use in construction leads to destruction of the ecosystem and contamination of natural resources (Fig. 1).

Various alternative materials have been explored to replace or reduce the amount of cement, gravel and sand in concrete. This leads to the creation of so-called 'green

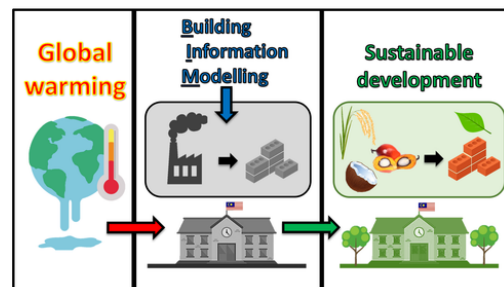


Figure 1: BIM facilitates sustainable development

concrete' which is a direct response to the need for sustainability in the construction industry. Green concrete may include agricultural wastes such as palm oil shell, coconut shell and rice husk. Not only are these materials eco-friendly, they are locally available meaning they are cheaper to procure and require shorter distances for transportation. These materials are abundant in Malaysia but are not fully utilized in the local construction industry (Fig. 2).

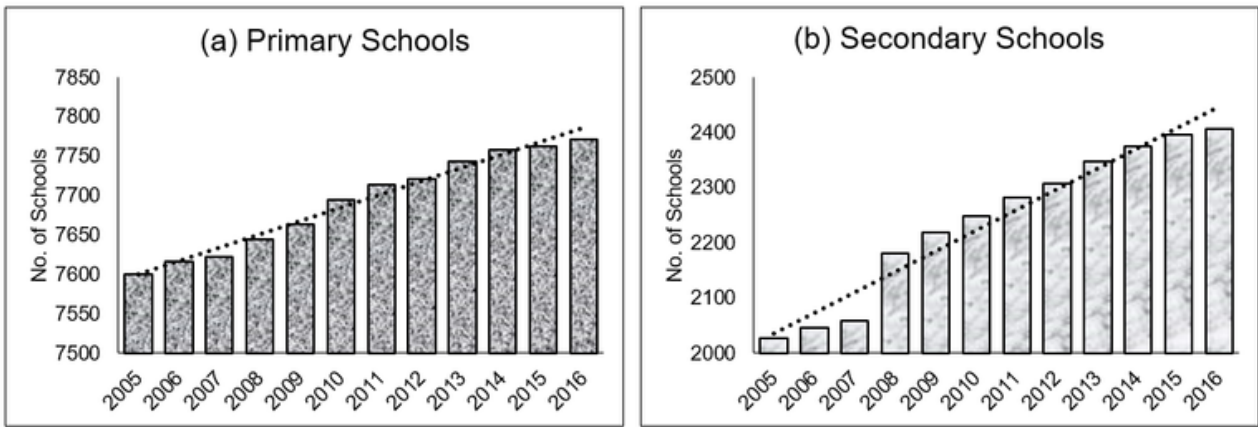


Figure 2: Growth of public schools in Malaysia (Source: www.ceicdata.com)

Consider a Malaysian public school. An average of 17 new primary schools and 38 new secondary schools are built each year. Many of these schools frequently use the same generic design. Here lies the potential to reduce environmental impacts from future schools. This is accomplished using a tool known as building information modelling (BIM) which is a software used to construct buildings in a virtual environment on a computer (Fig. 3). An important feature of BIM is that it provides the exact quantities of building materials used in a project. In this case, BIM provides the volume of concrete which allows an estimation of the environmental impacts of the school. Alternative green concrete mixes

can be tried out to see if it would lessen the environmental impacts without sacrificing on performance or cost. All this can be accomplished before starting any sort of construction.

In conclusion, eco-friendly schools have both a direct and indirect benefit on the environment. Schools are not just any building; in fact, schools are a place of learning and our youth spends a great deal of their time within its walls. Eco-friendly schools can impart environmental values into our future generation. They would better appreciate the environment and learn to embrace a holistic perspective of development.

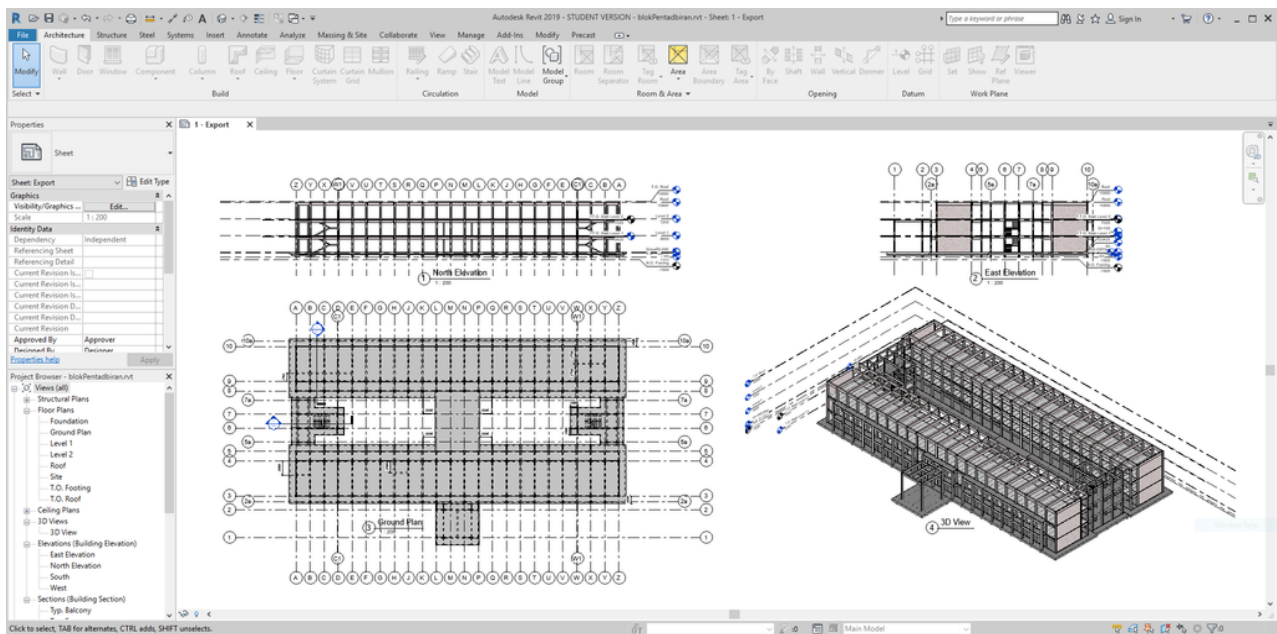


Figure 3: Screenshot of Autodesk® Revit® 2019 (an example of BIM software) with a virtual model of a school

MENTAL HEALTH LITERACY AND DEPRESSION

(Top 5 Shortlisted Contestant for Science & Technology Category in National Level 3-Minute Thesis Competition)

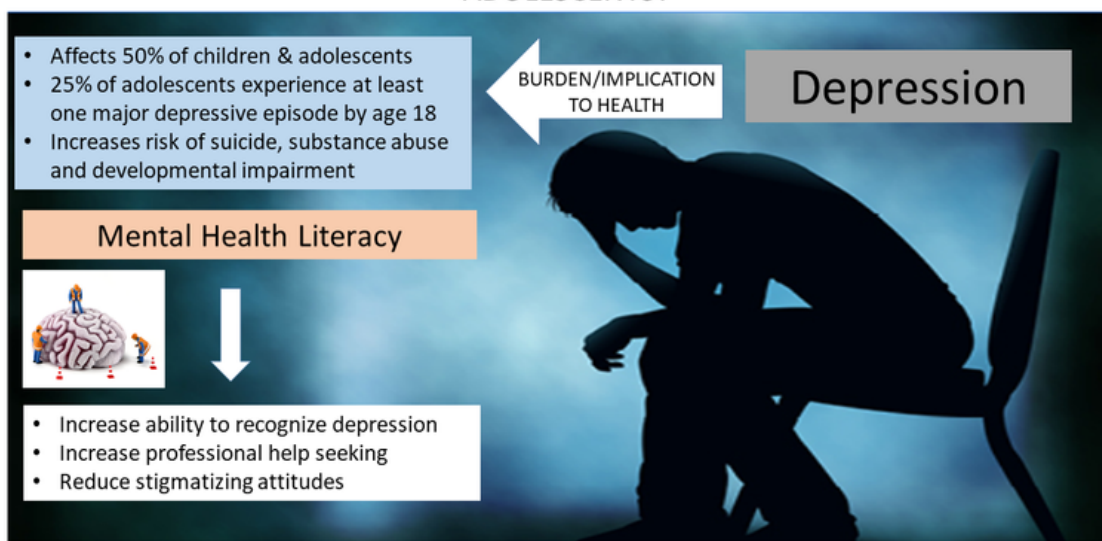
DR. SARBHAN SINGH LAKHA SINGH, FACULTY OF MEDICINE

DR. RAFDZAH AHMAD ZAKI, FACULTY OF MEDICINE

&

DR. NIK DALIANA NIK FARID, FACULTY OF MEDICINE

IS **MENTAL HEALTH LITERACY** ABLE TO REDUCE **DEPRESSION** AMONG ADOLESCENTS?



There is a saying that “The Eyes Do Not See What the Mind Does Not Know”. Depression is a common mental health disorder affecting many adolescents worldwide. The World Health Organisation has reported that by 2020 depression will be the second biggest cause of disability worldwide and by 2030 it will be the largest contributor to the global disease burden. With the rising prevalence of depression and its health implication among adolescents, more efforts are being place on early screening, treatment, management and prevention of depression. Despite these efforts only 20% of adolescents suffering from depression seek treatment and less than 40% of those receiving treatment comply with the regime. Such poor help seeking, and compliance rates could be contributed by many factors among them poor depression

literacy among adolescents. To enhance and optimize these efforts some countries like Australia, United States and Canada have utilize the concept of Mental health literacy (MHL). MHL, a concept derived from health literacy, was first introduced in 1995. MHL can improve mental health outcome via the following ways; (a) equipping individuals with adequate mental health knowledge (b) promoting positive help seeking intention, attitudes and (c) reducing stigma related to mental disorders. The key here is to improve MHL among adolescents so that they are able to recognize mental health disorders early on and seek more appropriate source of help. Unfortunately to date in Malaysia there are limited studies that have examined the field of MHL among adolescents. Therefore, we conducted a cross sectional study which

aimed to first determine adolescent's understanding of MHL, and second to examine the association of MHL and depression among Malaysian adolescents. These are important objectives that would provide baseline data regarding adolescents MHL. Over a period of 6 months 1800 adolescents from multiple national secondary schools in Selangor participated in a survey that assessed their understanding of MHL and depression symptoms. We found that despite majority of the adolescents (80%) having an intention to seek help if faced by a problem, only a minority (3.5%) of them were able to recognize depression. This therefore translates to a high possibility of these adolescents seeking inappropriate sources of help due to the underlying failure to recognize depression. More concerningly, majority (97%) of adolescents were classified as having inadequate levels of MHL (Fig. 1). Those with inadequate levels of MHL were more likely to suffer from depression.

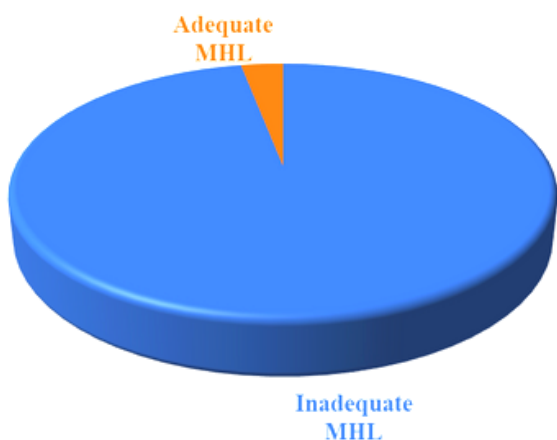


Figure 1: MHL among adolescents

Our findings suggest that there is an urgent need to increase understanding and awareness of MHL among Malaysian adolescents. This can be achieved by integrating the concept of MHL into the existing school based mental health programs, which is very important but is currently lacking within the education system. More specifically adolescents should be educated on the sign and symptoms of depression, risk factors for depression, helpfulness and harmfulness of various

mental health first aid actions, preventive and interventional strategies. Also, there is an urgent need to emphasize the importance of seeking professional sources of help for mental health problems. Finally, adolescents should be taught that mental disorders are not qualitatively different from somatic illnesses. Schools are an ideal place to provide mental health education to adolescents as most adolescents spend at least six hours a day in schools (Fig. 2).



Figure 2: Schools are an ideal place for mental health education

Beyond Blue and the Adolescent depression awareness program (ADAP) in Australia and the United States are examples of school-based depression education programs/ initiatives that have been put in place to improve the outcome of depression among adolescents. Adolescents with adequate levels of MHL would be better able to recognize depression early on. Early recognition of depression would create a sense of urgency to seek more professional sources seek help for oneself as well as for others. This would promote more positive help seeking behaviours which would reduce the possibility of delay in help seeking. Therefore, depression outcomes would improve as intervention would be provided early on.

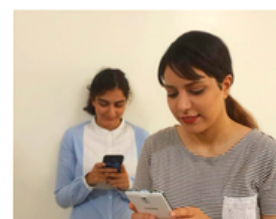
THE EFFECTS OF MOBILE-ASSISTED PROBLEM-BASED LANGUAGE LEARNING ON SPEAKING PROFICIENCY OF IRANIAN EFL LEARNERS

(UM's Contestant for Social Science Category in National Level 3-Minute Thesis Competition)

LOGHMAN ANSARIAN, FACULTY OF LANGUAGE AND LINGUISTICS

&

DR. TEOH MEI LIN, FACULTY OF LANGUAGE AND LINGUISTICS



Problem-Based Academic books

The learners' engagement with the learning content, self-directed learning, cognitive thinking and higher order thinking are the objectives of most recent approaches to learning and teaching. In addition, the use of technology in modern education is a sine quo non. One approach to learning that includes these features is that of Problem-Based Learning (PBL) (Fig. 1).

In an attempt to find out about the possible effects of mobile-assisted PBL on speaking proficiency of speakers of English as a Foreign Language (EFL), a convergent parallel mixed-methods study was conducted in the context of Iran. A Problem-Based Language Learning (PBLL) model for language classes was designed based on **Hmelo Silver's (2004)** model and **Hung's (2006)** 3C3R model. Using this model, the effects of mobile-assisted

PBLL was compared to the conventional language learning approach. The assessment rubrics included accuracy of grammatical structured, fluency, pronunciation, vocabulary, and task achievement. In addition, the views of the language learners in PBLL tutorship (the experimental group) were explored.

The experimental group (n=37) went through mobile-assisted PBLL instruction and the control group (n=33) went through conventional instruction. The Oxford Placement Test (OPT) was administered as a placement test, IELTS speaking test (Parts 2 and 3) was once administered as the homogeneity test-pretest and 3 times as post-tests. A semi-structured interview was also conducted twice, once at the middle and the other, at the end of the treatment with the experimental group participants (n=17).

The participants in the experimental group were asked to make sure they have installed Telegram software on their mobile phones. Telegram is the most widely used mobile application in Iran and most mobile phone users know how to work with this application. By using this software, the participants can type their answers, send a voice message or send a video of themselves instantly.

In the experimental group, every participant joined the online class. In addition, every two participants were asked to form an online private group by creating a private chat on Telegram. All participants were given an ill-structured problem at the beginning of each session and were asked to attempt to decode and analyze the topic individually. They were asked to identify what they already knew about the topic and what they needed to find. Next, they could carry out an online search to find the required information. Having conjectured about how the problem could be solved, they were asked to share their opinions with their group mates in their private groups and attempt to create a plan (conversation plan). They were supposed to make use of their group mate's ideas to enhance the quality of the conversations. Thus, among all the vocabulary items, grammatical structures and ideas found by the two groupmates, a selected number of them were used. Having produced the conversation, they were practiced in the group privately and were later presented to the group members in the main class group. All

participants gave and received feedback on the conversations. Later the participants had a short discussion through which they were asked to reflect on their learning and the lesson. In the discussion part, the teacher guided the participants to mostly discuss the question with regard to particular aspects which they had taken into account in their conversations.

The results of multivariate ANOVA (MANOVA) analysis after 26 sessions of treatment revealed that PBL can positively affect the participants' proficiency in terms of accuracy of grammatical structures, vocabulary, spoken fluency, and pronunciation; however, in terms of task achievement, no significant effect was found. In addition to this, it was found that the participants' views with regard to mobile-assisted PBL are mostly positive. The learners believed that this approach provides them with more practice in the form of monologues and dialogues to deal with real-life issues, and it also reveals their weaknesses to them. Furthermore, it increases their self-confidence, provides them with opportunities to check their pronunciation with peers in class and to compare them to valid online sources, which also affects their incidental vocabulary knowledge, their listening and speaking proficiency at the same time. This study can have pedagogical implications for curriculum designers, language teachers, material developers, and language test designers.

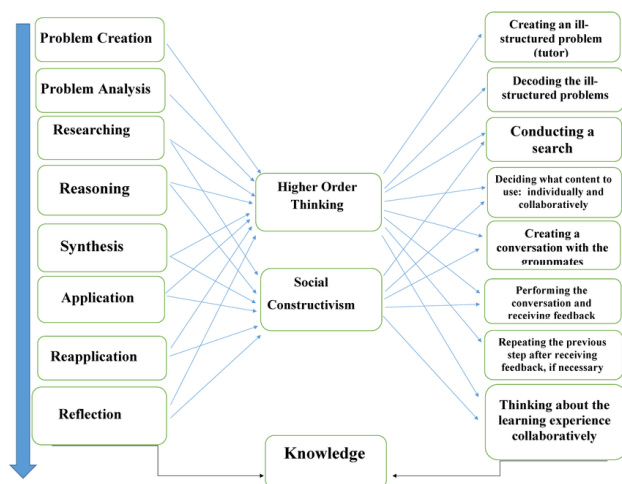


Figure 1: PBL model used in the study (designed by the researcher)

THE ROLE OF FABP7 IN TRIPLE NEGATIVE BREAST CANCER

(Runner-up of UM 3-Minute Thesis Competition)

KWONG SOKE CHEE, FACULTY OF MEDICINE

&

ASSOCIATE PROF. DR. IVY CHUNG, FACULTY OF MEDICINE

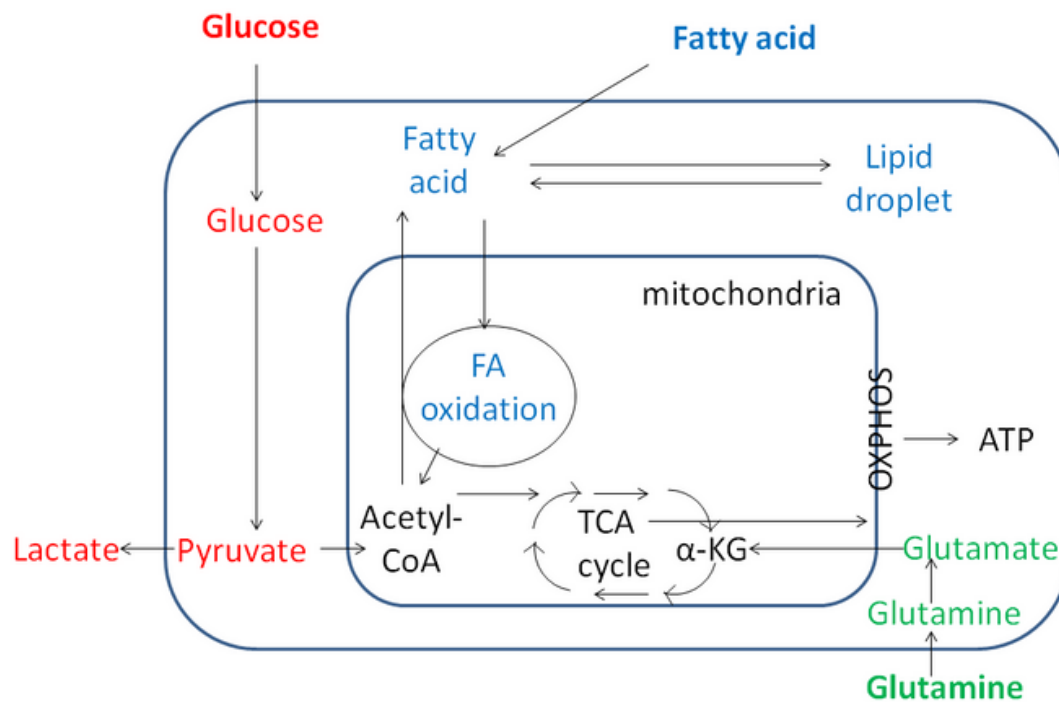


Figure 1: Krebs cycle - Conversion of glucose, glutamine, and fatty acids into energy

Cancer cells, unlike the normal cells, grow uncontrollably. These cancer cells require huge amount of energy for their survival and increasing growth. They harness glucose, glutamine and fatty acid – the three major nutrient components – from our daily food intake, and convert them into energy molecules, known as adenosine triphosphates (ATPs). ATPs contribute directly to each and every needs of the cancer cells, ranging from fundamental macromolecules synthesis to growth-promoting signalling.

Krebs cycle

To satisfy the increasing demand of energy, cancer cells manipulate an important energy-churning cellular process called Krebs cycle. Also known as TCA (tricarboxylic acid) cycle, it is a highly efficient process to generate ATPs from glucose, glutamine or fatty acid. Krebs

cycle is highly regulated, depending on the availability of oxygen. Glucose is broken down into pyruvate, which can be used for ATP generation via TCA cycle in the mitochondria (mitochondrial oxidation), or by conversion into lactate (glycolysis). Glutamine is metabolised into α -ketoglutarate, which enters the TCA cycle for ATP production. Fatty acid, on the other hand, is first processed in beta oxidation into acetyl-CoA, which is further metabolised via the TCA cycle (Figure 1).

Disrupting the energy check and balance

The ability to manipulate the Krebs cycle in meeting the energy demand is one of the key reasons triple negative breast cancer cells (TNBC) thrive to be one of the most aggressive and fatal cancers. With low 5-year survival rate (63% in TNBC vs 81% in non-TNBC), there are limited number of therapeutic

approaches available for these women. Unlike the more common luminal breast cancer type, triple negative breast cancers do not have specific markers to differentiate themselves, and hence their lack of specificity for targeted therapeutic approach.

Perhaps a more in-depth look at their metabolic profile may provide some clues into how energy is generated and used in these cells. There is evidence showing that TNBC is glycolytic, as indicated by an increased glycolytic intermediates and lactate accumulation in the tumours. However, another study demonstrated that TNBC tumours are more dependent on glutaminolysis. It is apparent that depending on the availability of nutrient type, these cancer cells can take advantage of a specific pathway in Krebs cycle. As the saying "All roads lead to Rome" indicates, is it the case here that, these cancer cells can satisfy their energy needs regardless what micronutrients available?

FABP7 – the gatekeeper to fatty acid metabolism

Our study may provide a clue that it may not be the case, at all. We study the functions of a chaperone protein, called fatty acid binding protein 7 (FABP7). Fatty acids are insoluble and hence could not move freely in the cells. With its high affinity to fatty acids, these proteins are thought to mobilize fatty acids from the plasma membrane into the different parts of the cell for beta oxidation, lipid droplet formation, or regulation of gene expression in the cells. This lipid trafficker, interestingly, is exclusively expressed in TNBC cells (Figure 2), and not in other breast cancer types. There are clinical evidences that those tumours expressing FABP7 may have a better prognosis than those who don't, suggesting a probable anti-tumour role of FABP7.

We discovered that the TNBC cells that express this FABP7 protein will have a tendency to utilize fatty acids, and not other

nutrients as the source of energy. Hence, when we removed fatty acids from the growth media, these cells could not efficiently adapt to this change to switch to utilizing other available nutrients. Consequently, these TNBC cells died of starvation.

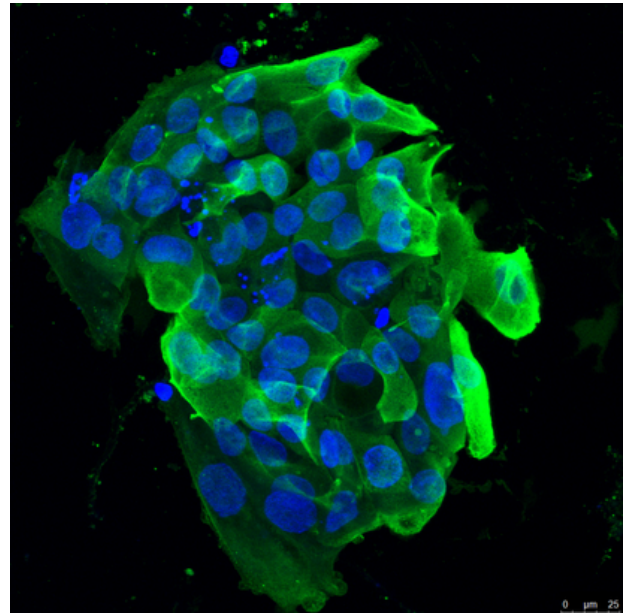


Figure 2: Fluorescence microscopy shows that FABP7 is predominantly expressed in human triple negative breast cancer (TNBC) cells. Green signals indicate FABP7 expression while blue signals represent the nucleus of cancer cells.

Which fatty acids work with FABP7?

We also found that not all fatty acids can work with FABP7 to kill TNBC cells. Among the diverse types of fats tested, only linoleic acid works well in partnership with FABP7 to induce TNBC cell death. This fatty acid subtype is abundantly present in vegetable oils, nuts and seeds. Our data shows that FABP7 sensitized TNBC cells to linoleic acid by modulating intracellular fats partitioning. Taken together our findings suggest that manipulating fatty acid levels is potentially a novel approach to force cellular suicide in TNBC cells that express FABP7. Further investigations to determine if such mechanisms apply in preclinical animal models of TNBC will guide necessary dietary interventions in TNBC patients according to their FABP7 expression. After all, we are what we eat.

DEVELOPMENT OF CHEMISTRY PRACTICAL WORK BASED ON 21ST-CENTURY SKILLS FOR MALAYSIA MATRICULATION PROGRAMME

(Runner-up of UM 3-Minute Thesis Competition)

NURUL FATNI ABDUSSYUKUR, FACULTY OF EDUCATION

PROF. DR. ROHAIDA MOHD SAAT, FACULTY OF EDUCATION

&

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The importance of chemistry practical work to chemistry education in enhancing the students' performance and scientific skills has been highlighted deliberately in literature. In fact, United Nation Education, Scientific and Cultural Organizations (UNESCO) and International Union for Pure and Applied Chemistry (IUPAC) in 2011 have suggested that science education curriculum need to be improved by the inclusion of hands-on experimentation for a better understanding of science. This increase young people in science as well as to promote the scientific literacy for scientific career and development of scientific thinking and experimentation among the school and university students.

In essence, there are evidences from past studies that chemistry practical work is able to enhance the essential 21st century learning skills among students. Similarly, the current policy and syllabus of Malaysia Matriculation Programme have highlighted the importance of practical work which is by 2018/2019 matriculation session; the evaluation of The practical work has changed from 10% to 25%. Furthermore, the Malaysia Ministry of Education has stated that practical work and acquisition of laboratory equipment will be the main focus in Malaysia Science education system by 2019.

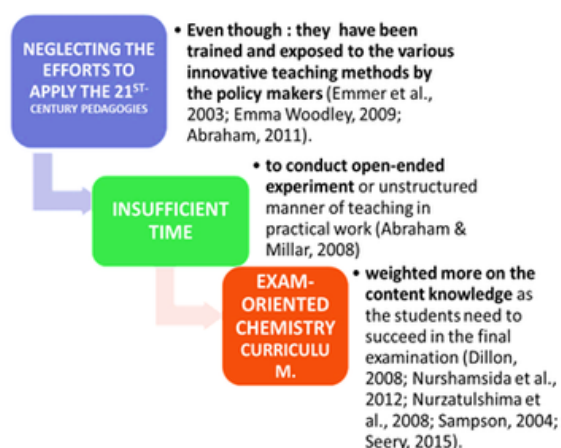


Figure 1: The main reasons of teachers' incompetency towards 21st-century pedagogies

THE EFFECTIVE PEDAGOGY

Based on the review of chemistry practical work of developed countries i.e. United States of America (USA), United Kingdom (UK), Finland, Australia, Canada and Singapore practices, it was found that all these countries are focusing on the 21st-century learning skills teaching approaches in pre university level i.e. higher order thinking skills, problem-solving skills, creativity, communication skills, critical thinking skills, cooperative skills, and the technology literacy. Meanwhile, to compare with Malaysia Matriculation programme curriculum it is far below the standard of comparable countries i.e. lack in implementing higher order cognitive tasks, self-directed learning, contextual based learning, open-ended inquiry experiments, technology literacy and 21st century skills (Fig. 1).

Furthermore, from the current studies from 2010 until 2017 done on pre-university level which is compatible with the Malaysian Matriculation Programme, the emergent patterns of the effective practices in chemistry practical work are directed to the needs of real-world experiments with open-ended inquiry experiments, inquiry-based techniques, critical thinking and problem solving techniques, and flipped teaching method proven effectively enhanced the chemistry practical work .

Moreover, communication skills with argumentation skills, inquiry learning skills and ICT and digital embedded proven effectively in the current researches to improve the instruction of practical work.

CONCLUSION

Therefore, there is a need to develop a pedagogical module of chemistry practical work for Malaysia Matriculation Programme based on 21st century skills with Design and Development Research design (DDR). Among the important 21st century skills are critical thinking skill, creativity and innovative skills and technology literacy skill are chosen for this study as it matched with the aspects of the open-ended inquiry learning.

Ultimately, with all of the interventions of 21st century skills in chemistry practical work, the expected pedagogical module in this study can be implemented effectively in the Malaysia Matriculation Programme context or to any equivalent programme of the pre-university-level institution in Malaysia or other countries.



THE DETERIORATION OF OUTDOOR THERMAL COMFORT AS AN EMERGING THREAT TO TROPICAL CITIES

(Runner-up of UM 3-Minute Thesis Competition)

FONG CHNG SAUN, INSTITUTE FOR ADVANCED STUDIES

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ASSOCIATE PROF. DR. NASRIN AGHAMOHAMMADI, FACULTY OF MEDICINE

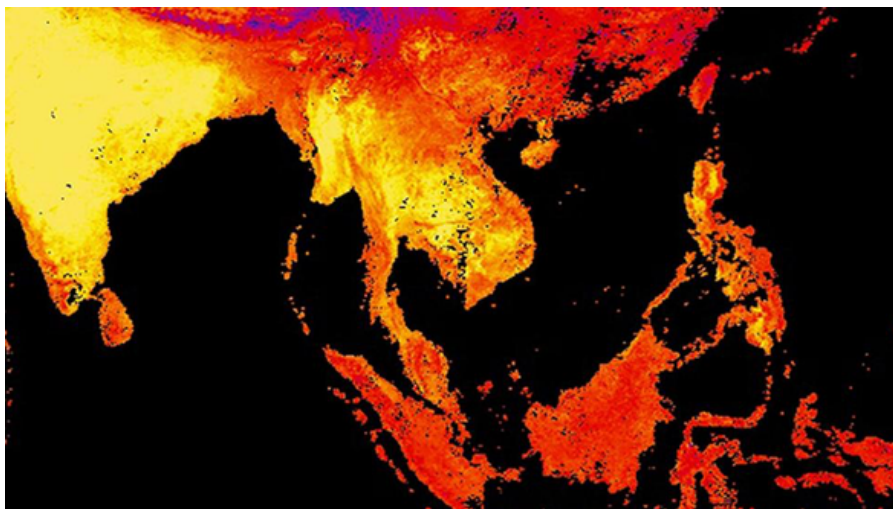


Figure 1: Scorching weather has set a record for the longest heat wave in at least 65 years in Thailand (44.6°C), Cambodia (42.6°C) and Laos (44°C) in April 2016. (Source: NASA's Earth Observatory Team)

Extreme weather and failure of climate-change mitigation and adaptation are the top 3 global risks in terms of its impact and likelihood of happening according to The Global Risks Report 2019. Tropical cities will suffer more from this environmental catastrophe due to its geographical location situated in the Earth's equator. The constant annual high solar radiation, air temperature and humidity implicate higher risk of frequent extreme heat event in near future. The impact from global climate change has severely affected tropical cities in Southeast Asia (SEA) in terms of increased air and surface temperature which leads to the occurrence of unpredicted weather events. In 2016, Thailand recorded the longest heat wave in at least 65 years with temperatures reaching 45°C (Fig. 1). In addition, few countries like Malaysia,

Singapore and Vietnam have all come very close to setting new national heat records.

The warming sensations are intensified in city centers because of the urban heat island (UHI) effect where rapid developing cities such as Kuala Lumpur is driving land use change from vegetated lands into impermeable surfaces and materials which traps heat and dissipates them at a slower rate. As a consequence, people living in the city center is prone to higher and longer heat exposure which affects their quality of life directly and indirectly. The health and well-being of urban communities especially among the sensitive and vulnerable populations such as children, elderly, pregnant woman and those with existing health conditions are at higher risk.

Despite the importance of the relating matter, the urban heat impact from the complex interaction in between the environment and built environment towards the urban communities' health and well-being is poorly highlighted in existing scholarly literature. Thus, a critical review on the assessment approach of OTC studies in the tropical context of SEA was conducted to discuss the methodological caveats and potential solutions. This review has several specific objectives. Firstly, this review aims to provide a general notion of OTC in a broader context. Secondly, this review provides a critical appraisal on the methodological discrepancies of OTC studies in SEA. Thirdly, a holistic approach for the improvements of future OTC studies is proposed. This review will also highlight future research directions of OTC studies in SEA. It is noteworthy that this review only included peer-reviewed studies on OTC from the tropical countries in SEA.

The definition of thermal comfort

Thermal comfort is defined as the condition of mind that expresses satisfaction with the thermal environment and is assessed through subjective evaluation. Thermal comfort is a study on the perception, sensation and acceptance towards the immediate thermal environment that involves the physiological and psychological aspects of the subject. The assessment of thermal comfort has been a very complex study involving the thermal state of environment with the human physiological and psychological activity (Fig. 2).

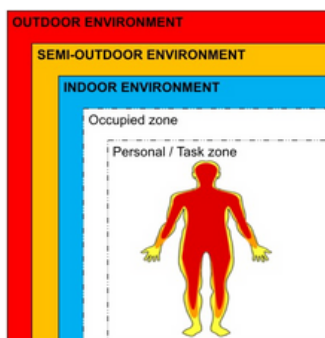


Figure 2: Layers of thermal environment surrounding a man (Fong et al., 2019)

Approaches in thermal comfort assessment

OTC assessments can be classified into four levels such as physical, physiological, psychological and social behaviors (Fig. 3).

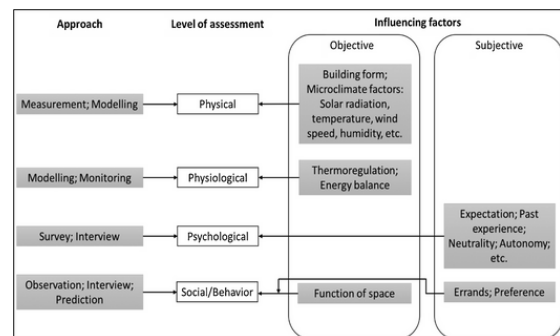


Fig. 3: A general framework for OTC assessment (Chen and Ng, 2012)

- i) Physical level considers the interaction of human body with the surrounding environment which is assessed through in-situ ground measurements or modelling of microclimate parameters such as air temperature, relative humidity, wind speed, and solar radiation;
- ii) Physiological level study the thermo-regulatory responses of the human body towards the thermal environment;
- iii) Psychological level considers the feeling of the person in terms of comfort, sensation, perception, acceptance and preference towards the thermal environment and is done using questionnaire surveys and interviews;
- iv) Social behaviors comprise of both objective and subjective measures which is assessed through observations and interviews. Social behavior studies requires large scale of study sample as it defines the thermal environment or thermal comfort acceptance as a norm of the society.

The study explore the complex interaction between urban environment, built environment and the urban health within a tropical city. Data collection is currently conducted in Kuala Lumpur to assess the urban heat impact towards the health and well-being of urban communities via validated questionnaire. The fundamental understanding of how urban heat is impacting the health and well-being will be crucial in the identification of effective urban heat mitigation approaches in a tropical city.

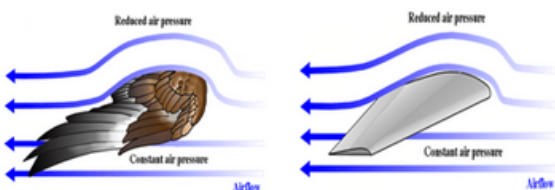
AERO-FACADE: AN INNOVATIVE CONCEPT FOR WIND-INDUCED VENTILATION IN HIGH-RISE RESIDENTIAL BUILDINGS

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The rapid growth of urban population and increasing income intensify the development of High-Rise Residential (HRR) buildings in the Southeast Asia. The availability of HRR buildings as a new typology of housing has helped considerably in meeting the demands of housing. Over 60% of the total building energy is consumed for purposes such as heating, cooling and ventilation systems.

The novelty of this research has brought together comfort ventilation and health ventilation in high-rise residential building through the Proposed Design with Interconnection Concept (PDIC).

The novel concept of this study comes through the fundamentals of natural ventilation and vernacular architectural features. The aerodynamic shape of airfoils from aerospace was used in the external surface of the building's façade to intensify the wind velocity based on Bernoulli's law.

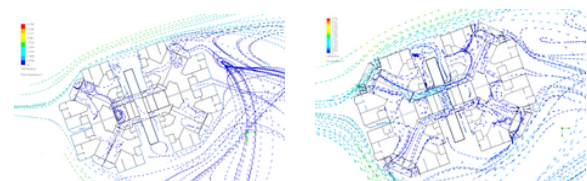


A bird fin; simple example of the half Venturi-tube. The wind velocity on top of the fin is higher than that at the bottom. The shaped airfoil surface and its Venturi-shape can be manipulated and applied at external surfaces of a building's façade to make flow constriction and consequently to improve the air velocity value at openings.

Field measurement and numerical simulation with Computational Fluid Dynamic (CFD) method were used to study the performance of the innovative concept, integration of airfoil slices to building façade as well as the integration of transom ventilation panel to produce sufficient indoor cross ventilation.

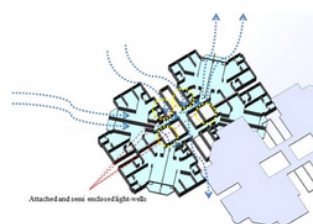
Criteria for the development of airfoils in building's facade

- Aesthetical values of building façade
- Cross ventilation can be achieved in HRR building.
- The chance of using natural ventilation even in the units at the rearward sides.
- Diffused penetration of daylight into the enclosed space - Visual comfort of occupants
- Triple airfoil slices is more affordable and cost-effective than the quadruple airfoil slices on the large scale
- Link the units through the building's corridors and light-wells can give the possibility to catch the wind in various orientations.



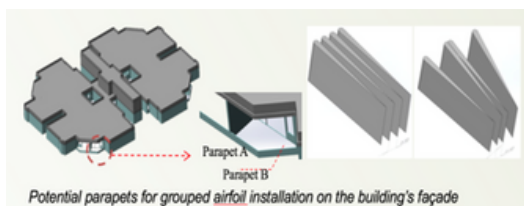
Airflow pattern and ratio before the application of the proposed design

Airflow pattern and ratio after the application of the proposed design



Wind velocity through grouped airfoils. The dotted circle shows the induced wind with less flow resistance and increased air ratio at the inlet area

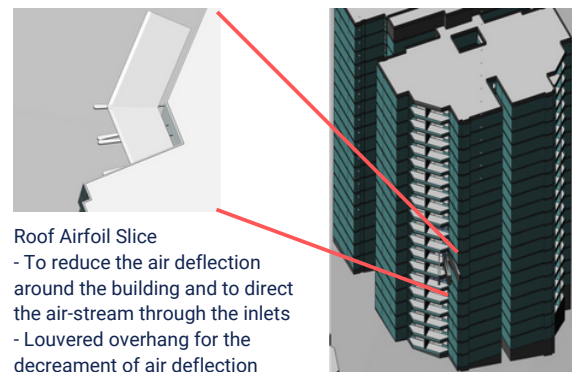
This study evaluated the health and comfort ventilation through proposing an idea to induce wind velocity in the high-rise residential building. It considered the indoor airflow pattern and ACH to make a balance in the ideal design. Furthermore, based on the results of previous field studies in Malaysia, the study found that comfort ventilation can be attained at certain times. As a result, the study found that the health ventilation can be fully achieved using the PDIC. However, the PDIC can only provide comfort ventilation especially on units on high floors facing to the prevailing wind.



The benefits of the "PDIC" proposed in this research to the relevant practitioners and stakeholders are seen in several areas as listed below;

- The PDIC has taken a holistic view in the establishment of the aerodynamic shape of an airfoil in the building to encourage the occupants to use wind resource freely. It helps them remove the odours and cool their indoor environment with minimum demand on mechanical ventilation. The outcome of this study could be treated as a foundation and studied individually by the practitioners for a better solution.
- Advantages of using natural ventilation in buildings, analysis of factors which influence on indoor thermal conditions, such as the unit's level and orientation, and the benefits of the establishment of PDIC in the high-rise residential building, provides an overview in guiding architects, wind engineers and other practitioners to tackle issues related to the passive ventilation in buildings.
- Flexibility in the use of PDIC in the residential units gives an opportunity to occupants to control the amount of indoor air by closing and opening windows and the transom ventilation panel.

- FloEFD simulation program is rarely used for airflow simulation in the built environment. By validating the software using the field measurement in the current study, practitioners, architects and wind engineers can use this sophisticated software for the evaluation of building ventilation performance. The post-processing options, user friendliness and capability to simulate indoor thermal conditions in the complex building ease the use of this software in the area of study.



The intention of enhancing wind induced ventilation in a residential building is to create comfortable indoor environment for the building's occupants. The triple airfoil slices along with the roof airfoil slice was embedded on the model to predict its proficiency on providing health and comfort ventilation in the residential units. The idea of interconnection concept which connects the residential units through the building corridors was proposed to increase the efficiency the grouped airfoils on providing wind induced ventilation. Study found that the PDIC can increase the ACH between 2 to 4 times supposed to the unit's level and orientation. The application of PDIC in the leeward sides at lowest floors can boost the indoor air velocity by 500%. For every 0.2m/s increase in outdoor wind speed, the ACH increased by 30 to 40 in windward units and increased by 1 to 2 ACH in leeward units. The study confirmed that wind velocity can be controlled and led to the inlets at the building's façade through the grouped airfoils integrated with roof airfoil slice.

PRIORITISING USER SATISFACTION IN SEARCH ENGINE EVALUATION (INFORMATION RETRIEVAL SYSTEMS PERFORMANCE)

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Information is available in abundance in different modes such as in books, journals, documents, web pages, newspapers, magazines and much more. This information can be presented in various forms such as text, audio, images or videos. People look for information to fulfil some queries or clarify doubts or gain some knowledge about something specific. However, such large amount of information can be overwhelming to start with in the first place. Especially, seeking information on the World Wide Web which grows and increases by the day. A proper mechanism for indexing and retrieval could lead to success in channelling the right information to the query from the user.

The process of information retrieval involves a system known as a retrieval system. An ad-hoc information retrieval system also known as a search engine with its underlying algorithm for indexing and query matching. The search engine could then retrieve the information and present the list of retrieved documents to the user. The list of information or documents should be those related and relevant to the user's query.

The information retrieval evaluation involves measuring the performance of the search engine, and is divided broadly into the system-oriented and user-oriented approaches. The evaluation of search engine is necessary to measure and quantify the effectiveness, and

assess user satisfaction and acceptance of the search engine. It is crucial in designing, developing, and maintaining effective search engines.

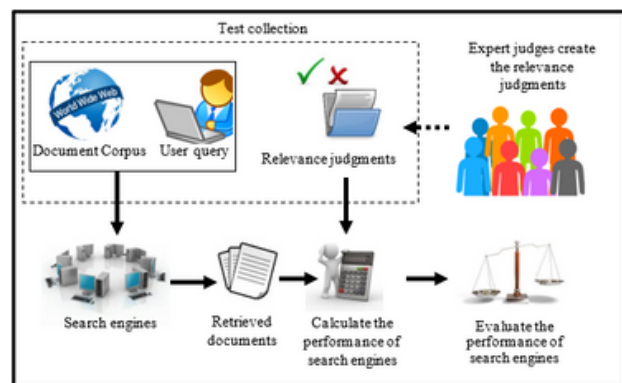


Figure 1: Search engine evaluation

The user-oriented evaluation focuses on the interaction of the user with the search engine, and the user's context and situation. It takes into account the usability of the interface, user's behaviour towards the search process, and user satisfaction but can be costly and time-consuming.

The system-oriented evaluation usually takes place in a laboratory setting with minimal end-user involvement, and shorter experimentation time and turnaround. It is also cost-effective, quantifiable and repeatable. The system-oriented evaluation involves measuring the search engines using a test collection (usually offline) consisting of a document corpus, topics or user queries and relevance judgments as shown in figure 1. The relevance judgments contain information

about the relevancy of documents to the queries in the Test Collection. The relevance judgments is usually created by experts of the topic which is necessary to evaluate the performance of the search engine in producing results that are suitable for the user's query.

The performance of the search engines can be measured using the retrieved ranked-list of documents and the relevance judgments. At this point, the search engines can be evaluated by ranking them in relation to other search engines to determine the better or worse performing search engines.

WHY DO WE NEED TO RANK VARIOUS SEARCH ENGINES?

The reason is, different search engines execute different algorithms, hence, it is important to measure which algorithm is performing better and how the algorithms can be further improved to achieve the goals set for the search engines.

EFFORT BASED JUDGEMENTS : USER SATISFACTION

Although the performance of the search engines is commonly measured by the relevancy of the retrieved document, the effort required in order to understand the retrieved documents is also an important factor for user satisfaction. Effort may include readability, findability and understandability. These efforts can be measured using features such as simple document features, HTML features and readability features. Users tend to prefer documents that are simple, not too lengthy, and contains at least one image and/or table for easy understanding, reading, and information identification. In contrast, documents which are lengthy, difficult to find information, and tough to read are not preferred. Laboratory experimentation reveals effort is an essential consideration in addition to relevancy when evaluating the search engines to ensure user satisfaction (Fig. 2).

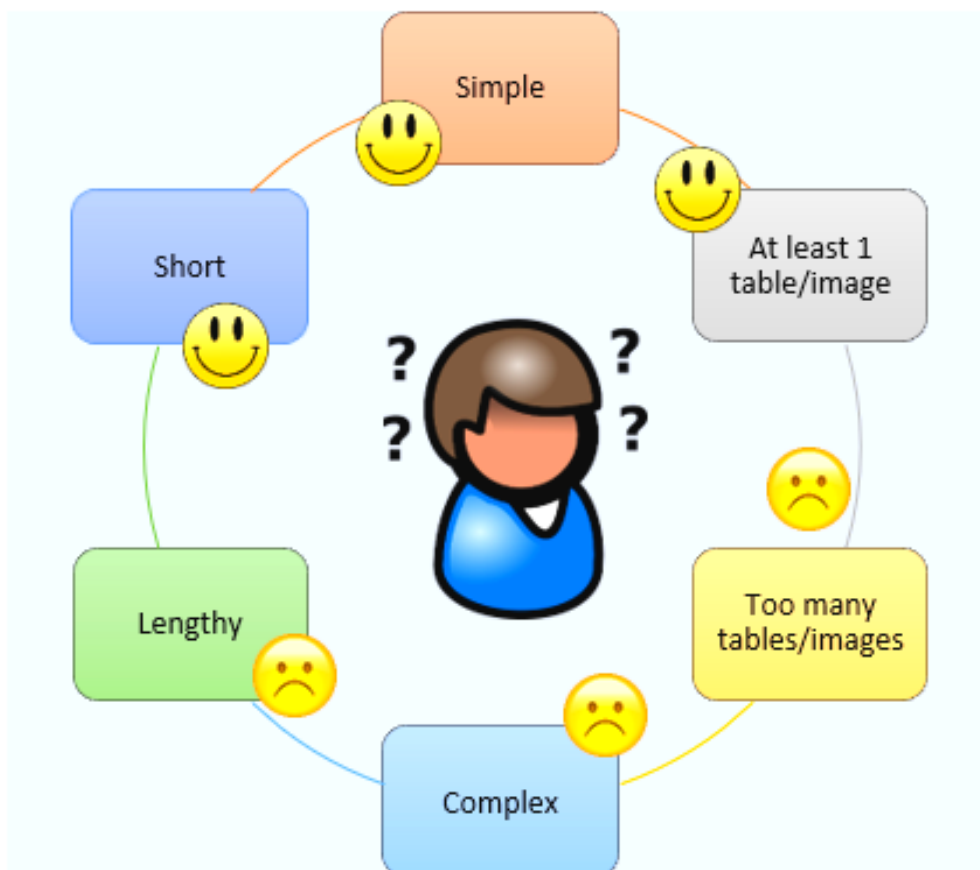


Figure 2: Effort preferred by users



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