MEDIA MATTERS

MCMC

NMRCP
Networked Media Research Collaboration Programme

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CONTENTS

MESSAGE FROM THE CHAIRMAN

In these unprecedented times, we have witnessed sweeping changes not just in our lives but around the world. Transformations have been forced upon all of us, not least our increased dependency on digital technologies. Being more connected has both equalized and widened parity to communities both within and without.

Digital communication is key to meeting today's considerable challenges and one which MCMC has embarked on long before the pandemic. Now, more than ever, it is vital to construct a path towards greater resilience and a durable recovery that builds on evidence and offer policy insights to enable us to build back better, together.

As such, I am pleased to introduce the third edition of Media Matters, a compilation of research funded under MCMC's Networked Media Research Collaboration Programme (NMRCP). The publication showcases MCMC's research collaboration with nine universities to produce a body of evidence that will contribute to our collective knowledge as well as a source of information for stakeholders and members of the public alike.

A broad range of areas, issues and populations were researched in these studies. An important research area is the study into young people and the risks and opportunities arising from their use of digital tools and services. Other group of researchers worked to develop frameworks, metrics and indices that could be used to measure or rank digital literacy competencies, rates of adoption of digital technologies and development of smart cities. The researchers also reported findings on how communication technologies have been positively leveraged to increase communal ties by enriching native languages and generally contributing to cultural preservation.

These studies have produced insights from which a number of applications may be taken up for regulatory and policy considerations from which well-aimed, specific actions can draw out the positive social benefits as well as providing valuable insights into the effectiveness and impact of our initiatives. We are thus informed as to what works and what does not, guiding us on how to best fine tune our programmes and make better allocations of our resources.

In closing, I would like to express my appreciation for the invaluable contribution of the NMRCP Steering Committee members towards the success of the programme as well as for the responsiveness of the research community. We believe that the trust and collaboration developed and nurtured will place us in a strong position to continue our research collaboration endeavours and be the basis of providing actionable evidence-based findings. Thus, the present and future research works provide rich inputs serving our ongoing efforts at ensuring that no one is left behind and we arrive at sustainable outcomes of equitable access and positive socio-economic use of communications and multimedia.

Thank you.

Dr. Fadhlullah Suhaimi Abdul Malek
Chairman
Malaysian Communications and Multimedia Commission

EXECUTIVE SUMMARY

Malaysia has a large number of internet users. According to the Malaysian Communications and Multimedia Commission (MCMC) 2018 Internet Users Survey, there are 28.7 million internet users (87.4% of the population) and 24.6 million social media users in Malaysia. We have become a nation of netizens consuming information and content from across the web. Such strong internet adoption requires studies to understand the impact of digital media on society, both positive and negative. MCMC is aware of this need and has been facilitating related research projects in this space for a few years now.

MCMC funded research projects such as the ones in this publication deliver reliable, fact-based conclusions that can be used to further our agenda of ensuring socio-economic benefits of ICT are spread wide and evenly. The 13 research reports in this publication examine diverse aspects of digital media and its impact on specific populations.

Three issues were examined in depth by these studies.

Social and cultural factors in ICT Development

One group of reports looked at issues such as whether policy makers took into consideration the diversity of cultural perspectives and values that are held by citizens of our multi-cultural society. The studies examined whether the special requirements and needs for different groups were addressed in terms of education and awareness as well as implementation.

One such study looked at the level of ICT adoption and its impact on cultural preservation amongst the native people of Sabah. A high level of ICT adoption was found, especially of the smartphone, across the native groups in Sabah. The researchers also confirmed that ICT adoption has a positive impact on cultural preservation of native communities in Sabah.

MCMC is also mindful of the need to continuously improve and refine our own work and to this end, another study in this publication examined the effectiveness of our Klik Dengan Bijak (Click Wisely) Program. The findings of this study will serve MCMC well when planning other programmes targeting children and youth.

'The New Media and the Consciousness of History in Malaysia: Ideas on National History and Other Histories' study found new media is bringing to fore different perspectives of the country's history that were based on ethnicity as well as regional sentiments. This study suggested the need to be aware of and understand the emergence of the different perspectives based on ethnicity and regional variance.

Influence of digital media on Malaysians

Is digital media adding value to lives? How much influence does it have on the various segments and groups that make up our population? Is the prevalence of digital media connecting or disconnecting populations? These are the questions some groups of researchers set out to examine.

One study investigated the challenges and issues of digital accessibility facing the more than 500,000 people registered with disabilities in Malaysia. The study found that the internet is widely used among people with disabilities, regardless of their types of disability and age groups. Despite the many challenges, the internet is both useful and beneficial in areas such as education, news and social networking. People with disabilities reported notably larger benefits from the internet than the general population and were mainly positive and confident about their own digital skills and competences.

Another study sought to discover whether visually impaired (VI) persons could have their online experience enhanced through the use of Assistive Technology (AT). The researchers developed a VI-friendly website using touch and sound feedback system as part of the project. The study found that the technology was useful, and the related website has potential to bring benefits to the target segment. However, challenges such as language barriers were encountered. The researchers also recommend that features be kept as simple as possible.

Secondary school students, a very important segment of our population, were the subjects of one of the studies. The researchers investigated Malaysian teenagers' attitudes and behaviours towards social networking, how concerned they are about the risks and dangers involved and how they manage them. It found that up to 30 percent of the students spend more than 5 hours online, an indication of how important online activities have become in their lives. The aim of the study was to come up with fact based findings that could aid in developing better monitoring and protective measures for them. Encouragingly, the study suggests that not all those hours are spent for entertainment or social pleasures. The students also used social media apps for learning purposes. The study found that although the students had general awareness of online safety practices, they displayed lack of knowledge and awareness in specific issues such as privacy.

Are smartphones changing how humans interact with one another? This was the start point for another study. This timely research examined the use of smartphones and the internet and its impact on families and social relationships. The target group were young Malaysians aged 11 to 18 years old. It also examined how parents viewed their children's use of Internet and smartphones, their concerns and their control methods.

This study discovered that parents, students and social communities each have their own concerns. It also found that while behavioural patterns are emerging, they have not affected family and society ties. However, levels of internet addiction may be a concern.

Internet addiction formed the basis of another study. The researchers explored the nature and impact of excessive internet usage, measuring the level of depression, anxiety and stress among the secondary school students. An intervention programme using Cognitive Based Therapy (CBT) was developed as a treatment option. It provides subjects with skills and exercises to control thoughts, feelings and behaviours that are linked to problematic internet use. The programme has trained the first batch of school counsellors. They have applied the programme in selected secondary schools nationwide and proved its validity and effectiveness.

Senior citizens and their interaction with Internet Centres was the subject of another study. The researchers looked at motivations and obstacles to their use of the centres and internet usage in general. The study also found that the centres were useful. Senior citizens were using the facilities, but they appear to prefer using their phones instead of PCs.

Measurement of digital media literacy

The final group of studies sought to create benchmarks and standards that would help to better measure results and impact of programmes. One study came up with proposed national standards that could be used to evaluate digital media literacy and digital participation of young people in Malaysia. It has ten components and specific indicators under each component was created for use in a practical manner for research and policy impact. The researchers went on to use the framework to develop a digital media literacy resource toolkit for secondary school students called Generasi Digital. Students found that the game sparked thoughts about thinking critically and making wise and responsible choices in the digital age.

Lastly, a group of researchers sought to develop an index that captures the essence of a Smart Community. The index was based on the Informative Global Community (IGC) Development index. It took the four key components of the IGC, namely Human, Technology, Information and Value as reference points. The study then used the index to track changes and growth at four selected Smart Community sites in Peninsular Malaysia, Sabah and Sarawak. It was found to be useful in tracking the improvement of lifestyle and quality of life, community empowerment as well as the development of a creative and innovative culture amongst these communities.

The researchers also looked at the factors that drives the usage and participation, and impact of MCMC's initiatives at the four Smart Community sites. The findings revealed that the digital divide was being narrowed and that these communities were in favour of the initiatives being continued but highlight the need for guidance from experts and funds to ensure that the initiatives were sustainable.

Conclusion

MCMC is aware of its responsibilities as a regulator and developer of industry. We pursue the rollout of quality and affordable services and equitable access to end users. In so doing, MCMC strives to be forward-thinking in identifying emerging issues and research gaps for policy and regulation. We understand the potential of research to explore, anticipate and address complex and inter-related environmental, technological, public health, economic, social and lifestyle challenges related to technology adoption and the realisation of the vision of a digitally connected and digitally inclusive nation.

Digital Media Literacy:

Cultivating Productive Practices among Young People in Malaysia

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ABSTRACT

Regulatory frameworks for media literacy which encompass consumer protection and social regulation are areas of regulatory concern. The present study was interested to examine competences of young people in relation to five areas: information, communication, content-creation, safety and problem solving; to map key players promoting media literacy and the ways they conceptualise their programmes; and to develop components of a media literacy framework that can be used to cultivate productive practices among young people. The study employed both quantitative and qualitative methods. The findings of a self-assessment revealed that the respondents felt generally capable when working with information, and moderately capable with communication and safety but had difficulties with content creation and problem-solving.

The second part of the study found that media literacy projects among young people took place in an ad-hoc and piecemeal manner. Many programmes focused on cyberbullying, sexual grooming and other online adult crimes against young people. Very little information was available on which schools and agencies were working on which issues, in what ways and with what levels of effectiveness. Following this, the third part of the study developed *Generasi Digital*, a digital media literacy resource toolkit for secondary school students built on a framework of 10 themes that included quizzes, values and lessons learnt. The resource toolkit was tested in schools and students remarked that the game sparked thoughts about thinking critically and making wise and responsible choices in the digital age.

Keywords: Media literacy, Digital media literacy, Information communication

INTRODUCTION

New media are a frontier, rich with digital tools, services, applications and content but while they bring benefits and opportunities, there are also risks, particularly for young people, given the unequivocal integration of the internet in their life today. Studies focusing on young people's media culture hold an important place in Malaysian media research, specifically when the responsibility to assess the credibility, authority and value of information lies with the reader and receiver. Although media and internet use is increasing among young people, this does not imply that they develop the strategic skills needed to benefit from it in different aspects of life (Livingstone, 2011; Hobbs, 2010; Miler & Barlett, 2012). Often, many useful features of the social media remain substantially underused while problematic online experiences such as altered photographs, simulated videos, fake news, sexual exploitation, cyberbullying or pornography are flooding the internet and shaping the ideas and beliefs of young people (Shanthi Balraj et al, 2013; Normah Mustaffa et al, 2011; Sarah Farhana Juhari & Nor Azan Mat Zin, 2013).

Media literacy emphasises the users' pivotal role to exercise choice and responsibility when engaging in the online environment. To achieve this, regulatory measures are needed and MCMC can provide leadership in advancing media literacy in Malaysian communities. The focus on cultivating productive practices here supports outreach and advocacy goals in empowering young people with capacities that enable them to engage effectively with the ability to access, analyse and create communications in today's increasingly digitised society. These groups of people are growing up in an interactive digital and media environment where they can access media, share messages and images and participate in productive and risky activities, whether consciously or unconsciously.

> Digital and media literacy becomes a concern when young people are immersed in cyber cultures without an understanding of knowledge, skills, values and responsibilities.

Interestingly, there is also a disconnect between in-school and out-of school experiences where school settings do not delve into critical and creative analyses of communication when addressing online practices among students. It is not clear how spaces are created in schools to engage young people with digital and media activities. This project opens spaces in schools to explore how young people can engage in digital and media literate activities in productive ways.

The outcome from collecting and gathering data on young people's media practices will enable policy makers, practitioners and civil activists to identify and map key trends as well as engage, participate and better shape the future of contemporary cultural lives of communities in Malaysia. The present study was interested to advance digital media literacy in school settings with a focus on young people's competences in five areas: information, communication,

content creation, safety and problem solving. The study was also concerned with the forms of media literacy initiatives taking place in Malaysia in developing a framework and toolkit that can be used to enhance the ways young people access, understand, evaluate and create communication and media in their lifeworld experiences.

Specifically, the objectives of this study are to identify the competences of young people in the five areas. Another objective is to map key players promoting media literacy and the ways they conceptualise their programmes. This study also intends to develop components of a digital media literacy framework that can be used to cultivate productive practices among young people as well as to develop a digital media literacy toolkit for young people in secondary schools.

LITERATURE REVIEW

Studies focusing on young people's media culture hold an important place in Malaysian media research, specifically when the responsibility of assessing the credibility, authority and value of information is for the reader and receiver. Given the rapid movements in the new media settings, it is essential to respond quickly to the role of media literacy in this digital age.

The aim of media literacy is to increase awareness of information access, communication possibilities, the many forms of media messages and participatory cultures encountered in everyday life. It should help young people to recognise how the media filter their perceptions and beliefs, shape popular culture and influence personal choices. The ability to search for information from reliable sources and the capacity to create productive content for a more humanistic society are core concerns that must be taken into account when embarking on media literacy programmes.

Digital Media Skills among Young People

Livingstone (2011) raises the concern of media literacy in developing critical abilities necessary to function as enlightened citizens and consumers in a mediatised society. She notes the need to assess the capacity of young people in using and making sense of media technologies in their everyday lives. Working for the European Commission, Ferrari (2013) advances ideas developed from al-Mutka (2011) to construct a framework for understanding and assessing digital skills and competence. The work of Ferrari (2012, 2013) that asserts on operational dimensions of media literacy is significant in the present study. Her project was based on a data collection phase (including a literature review, case study analysis, and an online survey) and intensive stakeholder consultation (workshops, interviews, reviews by experts, presentations at seminars and conferences) to develop competences in the areas of information, communication, content creation, safety and problem-solving. Ferrari's framework on digital media competences was useful in guiding and appropriating the self-assessment of young people's skills to gain insights on their views of their strengths and difficulties confronted in digital media practices today.

Development of Digital Media Literacy Initiatives

Issues concerning a digital generation is closely linked to questions about how we develop an education system that is able to face the challenges of the 21st century. A growing field of literature inclined to raise awareness has argued that future-oriented perspectives on literacy is in contrast to the dominating trend in most countries where the emphasis is on a traditional transmission model of knowledge acquisition.

Much has been deliberated on what young people need to know across different kind of media and curricula, the danger of becoming too oriented in technical operations rather than broader aspects of how young people relate to digital media technologies, participatory cultures, information access, content consumption and creation, communication possibilities, representation and meaning making and understanding different publics in their online and offline worlds. These broader aspects are crucial in developing critical autonomy among young people in their daily experiences of making sense of their surrounding realities and in making decisions about media use and its implications (Erstad, 2015; Livingstone, 2011; Jenkins et al, 2015; Buckingham 2007; Masterman, 1985).

Digital media literacy in a broader sense as argued above is visibly missing in the Malaysian school curricula. Nevertheless, there are initiatives run by corporate, educational and non-government agencies to raise awareness on specific issues confronted by young people in communicating and navigating in online environments. The frameworks offered by digital media literacy scholars will be instructive to explore key players, curricula development and assessment of digital media literacy programmes in the present study.

Design and Development of A Digital Media Literacy Framework and Toolkit for Secondary School Students in Malaysia

The present study took an interesting turn when the focus fell on an action plan to develop a framework and a toolkit that can be used in school settings to enhance digital media literacy among young people. It was felt that the materials need to be appropriate for local contexts which confronted diverse challenges in learning and teaching dimensions, such as conventional methods that are teacher-centred rather than learner-centred, the use of disruptive technologies in school settings that are still frowned upon among many school authorities and the importance of fun-learning, values and empathy in design of the toolkit. Ferrari's (2013) ideas on digital competences, The National Education Philosophy, The Education Blueprint 2013-2025 and Tajul Arrifin Noordin's (1993) work on noble values were significant in thinking about the framework and design of the toolkit.

METHODOLOGY

The study adopted an exploratory approach that provided valuable, quality information on young people's media practices and measurement frameworks. A mixed method that advanced the systematic integration of quantitative and qualitative approaches within a single investigation of inquiry was an ideal technique to access complex research such as this study.

Figure 1: The research was conducted between June 2015 till December 2017.

Target Group
Secondary School · 16 -18 years old

Identify the competency of young people in the five areas	**Promoting Media Literacy**
Survey (Face-to-face) (Sample: 1200) **6** Regions (Urban and Rural)	**Designing of Media Literacy Toolkit** Literacy Interactive Comics: *"Generasi Digital"* Floor Mat Game: *"Rimba Celik"*
Focus Group Discussion **36** secondary school groups with **191** participants	

Creative Designing of Media Literacy Toolkit – *Generasi Digital* & *Rimba Celik*

This study adopted a creative methodology anchored on the premise that creativity is an innovative human capacity that can be nurtured and cultivated through artful thinking, doing and making. A group of university students from the School of Arts, USM were invited to conduct focus group discussions and to design stories related to selected themes on media literacy. The students interviewed their peers and school children to hear their stories on media and internet knowledge and practices. The Arts students also listened to the interviews with school children to comprehend the anxieties, hopes and fears confronted in social media relationships.

The designing of the *Generasi Digital* interactive comics and the *Rimba Celik* floor mat game involved promoting creativity and imagination in learning, and offering alternative aesthetic forms of knowledge production. This methodology encompassed five creative processes: Discovery, Interpretation, Ideation, Experimentation and Evolution through which the student designers researched and collected primary data on media experiences, discovered problematic matters, interpreted views of young people, and ideated stories and characters that make sense of the media life worlds.

Ten storyboards were developed and later outsourced for the production of *Generasi Digital*-interactive comics. These interactive comics were tested with secondary school young people and fine-tuned accordingly to ensure the learning outcomes were delivered effectively. It may be useful to add that the project attempted 10 episodes in the interactive comics. Much time was taken to ensure that the interactive comics offered interesting stories, included a short assessment on knowledge of participants on media literacy issues and conveyed important values as espoused in national education philosophy.

In the case of *Rimba Celik*, the floor mat game was adapted from the Snakes and Ladders game. The game involved Apps and Virus elements. The Apps enable the player to move forward while the Virus will push the player backwards. Cards were drawn when a player landed on the Apps or Virus spots on the floor mat game. The cards revealed productive and non-productive scenarios that enable players to learn about positive and negative online interactions.

Survey and Focus Group Discussion

Questionnaire surveys on self-assessment of digital competencies were also implemented to examine media activities and skills in the five areas being researched. The study was conducted among young people in a face-to-face national sample of 1,200 young people aged 16-18 across urban and rural schools in Malaysia. The study population was divided into six regions, namely Northern (Perlis, Kedah, Penang), Central (Perak, Selangor, Wilayah Persekutuan), Southern (Negeri Sembilan, Malacca, Johor), East Coast (Kelantan, Terengganu, Pahang), East Malaysia (Sabah) and East Malaysia (Sarawak).

In addition, focus group discussions were held with a total of 36 secondary school groups with 191 participants to get feedback on the interactive comics and the '*Rimba Celik*' game to ensure that the creative works and activities were effective.

The whole research process has been a challenging one with a focus on creating relations and conversations with different groups of students, school principals, education departments and other government and non-government agencies. The main task of empowering young people led to the strengthening of ideas based on tested activities and field work evidences that constantly respond to new ways of working collaboratively in addressing the impact of digital media technologies and in initiating intervention strategies.

FINDINGS

This section of the article offers insights on demographic data of study respondents; skills of young people in the fields of information, communication, content-creation, safety and problem solving; key players promoting media literacy and their programmes; and the development of components of a media literacy framework for cultivating productive practices among young people.

Key Characteristics of the Respondents

This section offers insights into the respondents of the study to give a general understanding of media practices among young people.

Table 1: Demographic data of respondents (n=1,200)

	Demographic	N/(%)
Gender	Male	495 (41.2)
	Female	705 (58.8)
Ethnic Group	Malay	676 (56.3)
	Chinese	171 (14.3)
	Indian/Punjabi	104 (8.7)
	Indigenous Group (Kadazan, Iban, etc)	196 (16.3)
	Dayak	53 (4.4)

Skills of Young People in Five Domains: Information, Communication, Content Creation, Safety and Problem Solving

A self-assessment exercise was conducted where the respondents were asked to indicate their skills on a scale of 1 – 4; 1 as least capable and 4 as most capable. The findings suggested that the respondents generally thought that they were proficient in many skills. The respondents noted that while they were generally capable when working with information, and moderately capable with *communication and safety*, there were still some activities that they struggled within these domains. The major difficulties, as noted by the respondents, fell in content creation and problem-solving domains. Table 2 shows the young people's self-assessment of their competency.

Information

On a scale of 1 - 4, the respondents stated that they were skilful in browsing, searching and filtering information, and storing and retrieving information but less skilful in evaluating information (Table 2.1).

Table 2: Young people's self-assessment on their competency. Overall Skills (n=1,200)

Sections	Mean	Standard Deviation
Information	3.12	0.75
Communication	2.77	0.86
Content Creation	2.39	0.86
Safety	2.87	0.87
Problem Solving	2.67	0.83

Table 2.1: Information theme indicators (n=1,200)

Information	Mean	Standard Deviation
Browsing, searching & filtering information	3.14	0.71
Evaluating information	2.95	0.78
Storing and retrieving information	3.27	0.75

Communication

On a scale of 1 – 4, the respondents thought that they were competent in interacting through technologies, but less so in sharing information and content, engaging in online citizenship, collaborating through digital channels, netiquette and in managing digital identity (Table 2.2).

Table 2.2: Communication theme indicators (n=1,200)

Communication	Mean	Standard Deviation
Interacting through technologies	3.16	0.80
Sharing information and content	2.76	0.84
Engaging in online citizenship	2.75	0.84
Collaborating through digital channels	2.74	0.86
Netiquette	2.65	0.92
Managing digital identity	2.55	0.91

Content Creation

The respondents noted that they were not that capable in content creation, specifically in developing content, integrating and re-elaborating content. In addition, they were seen as less capable in understanding issues on copyright and licenses as well as programming (Table 2.3).

Table 2.3: Content creation theme (n=1,200)

Communication	Mean	Standard Deviation
Developing content	2.71	0.82
Integrating and re-elaborating	2.59	0.87
Copyright and licenses	2.03	0.85
Programming	2.22	0.89

Safety

In this domain, the respondents held that they were capable of protecting health and personal data but less so in protecting devices and the environment. They were confident in their ability to protect their online personal data from being used by other parties. Interestingly, the respondents indicated that they were quite capable in knowing how to protect themselves from cyberbullying and in knowing how to block unhealthy content published on the internet (Table 2.4).

Table 2.4: Safety theme indicators (n=1,200)

Safety	Mean	Standard Deviation
Protecting devices	2.53	0.94
Protecting personal data	3.02	0.83
Protecting health	3.05	0.87
Protecting the environment	2.87	0.83

Problem Solving

In this domain, the respondents appeared to indicate that they were quite capable of identifying needs and technological responses, innovating and creatively using technology and identifying digital competence gaps; however, they appeared less capable of solving technical problems (Table 2.5).

Table 2.5: Problem solving theme indicators (n=1,200)

Communication	Mean	Standard Deviation
Solving technical problems	2.38	0.86
Identifying needs and technological responses	2.85	0.77
Innovating and creatively using technology	2.70	0.85
Identifying digital competence gaps	2.78	0.84

In summary, the findings above revealed that Malaysian young people thought that they were capable in searching, evaluating and managing information. The respondents believed that they could interact with new technologies when it comes to communication as well as protect personal data and health (blocking unhealthy material and managing cyberbullying). However, they held that they encounter difficulties in developing content and understanding issues related to copyright and programming.

The findings suggest that spending time online did not mean that young people were developing media literacy skills. It is crucial that policy makers and relevant stakeholders design programs that will inculcate knowledge and skills in different areas to ensure that young people can be media literate and be creative knowledge consumers and creators.

Key Players Promoting Media Literacy and their Programmes

A cursory internet search of media literacy related programmes from 2005 to 2015 in schools and in communities revealed that there were many key agents making efforts to connect and to provoke thinking about the media participation among young people. The Ministry of Education has embarked on digital and media related studies which largely focus on ICT skills, technical operations, data coding and programming while less attention is given to critical thinking, user safety and content creation, participatory cultures, information access, representation and meaning-making.

External agencies have also run numerous projects with schools and young people focusing on cyberbullying, internet safety, online grooming and robotics. The agencies have done well to contribute to cyber wellness of young people; however, more needs to be done to improve thinking about media literacy capabilities and competencies as well as focus on assessment criteria in managing media literacy. To date, many of these projects remain ad-hoc, piecemeal and fragmented and there was no information on assessment on competences derived in the projects. Moreover, these projects have limited reach and little nationwide measures. Many of the projects had short term vision and received short-term finance. While the macro-level of the projects can be described, the pedagogical terrain of curriculum, assessment, monitoring of programmes, trainer/teacher capacities and teaching/learning with new technologies remain undocumented, leaving a lacuna in this area.

It is asserted here that the role of the academia is critical for the development of ideas on media literacy. Conversations on digital media literacy, recommendations for best practices, and implementation and assessment procedures for an integrated range of technological, social and humanistic approaches to enhancing media practices need deliberation. The role of media literacy and the implication it may have on policy makers, researchers, teachers, parents and young people themselves is not widely a topic of discussion within the institutions of higher learning.

Development of A Digital Media Literacy Framework for Cultivating Productive Practices Among Young People.

It is helpful to highlight here that work on the toolkit began with thoughts on the conceptualisation of media literacy. We turned to the National Education Philosophy and meanings of media literacy in the global context to offer the following guiding definition for Malaysia:

Individuals who are intellectually, spiritually, emotionally and physically balanced and harmonious; and have the ability to access, evaluate and create communications in a variety of contexts.

Using the above definition for media literacy, we aimed to develop resources for a toolkit to provide leadership in advancing media literacy in Malaysian schools. Given the crowded curriculum in secondary schools, it was felt that the approach to media literacy in Malaysian schools should adopt an informal approach with a focus on conversations, empathy and fun. The voices of young people were emphasised to enable them to engage in storytelling about their media experiences and encounters.

We recruited young designers from a local institution and developed *Generasi Digital*, a 10-episode package in the form of interactive comics. In addition, *Rimba Celik*, a floor mat game as well as a number of board games were also created to induce enjoyment and engagement in the learning lessons.

Generasi Digital: Interactive Comics

Characters from Malaysian folk tales were used to ground the interactive comics. Attention was given to numerous elements: quiz, values and lessons learnt in the Malaysian context. The values and lessons learnt components in each episode deliberated on ideas that will contribute to the development of intellectual, spiritual, emotionally and physically balanced and harmonious persons. The 10 episodes were offered at two levels, Level 1 and Level 2. These episodes anchored themes that were relevant to young people and media experiences in Malaysia.

Figure 2: Final design of characters for Generasi Digital interactive comics

Title of 10 episode Interactive comics	Theme
Pahit Manis Kehidupan Si Bintang Internet	Information Literacy
Jejak-Jejak Dunia Digital	Digital Footprint
Obsesi Diri Memakan Diri	Self Image
Kisah Si Batu Api	Communication and Relationship
Pelajar Produktif	Productive Practices
Hak Cipta Tidak Terpelihara	Copyright and Intellectual Property
Cinta Siber itu Buta	Internet Safety
Kepercayaan Dikhianati	Privacy and Security
Berhati-hati Masyarakat Memerhati	Cyberbullying
Pemikiran Kritikal	Critical Thinking

Figure 3: Interactive comic episodes and themes

An offline mobile application was constructed to enable users to go through the comics and answers the quiz accordingly. The score of the quiz was recorded and certificates were awarded to players who scored more than 85 percent at each level. The games were tested in schools. The *Generasi Digital* apps can be downloaded from Google Playstore or Apple Store.

Figure 4: Screenshot of Interactive Comics

Figure 5: Engaging young people with a fun approach to learning

Testing and Feedback of *Generasi Digital*

In general, most of the respondents were happy and excited to explore the apps on the tablets as this was the first digital learning device on media literacy which appeared in the school setting. Majority of the respondents felt positive that the content of this interactive comics enabled them to learn about media literacy in an effective way and the topics were appropriate for their age. However, some respondents suggested making the apps a little bit more challenging by adding in more questions as well as programming it in a way where they could compete with their friends through answering the questions. They suggested that the screen could provide scores of the other friends so it could be more competitive as they strived to get highest scores amongst them.

The respondents' comments were duly noted and it can be said that the overall learning elements were successfully delivered as respondents could understand the narratives and the lessons learnt as well as the values conveyed in each episode. Many of them scored more than 70 percent correct for the quiz on the interactive games.

Among the most significant matters that the respondents had learnt was how to protect their personal data, being alert for online scammers especially when doing online shopping where some of their personal data might be exposed to public. Thinking before uploading pictures and sharing some sensitive issues especially about religion or politics were topics that roused the attention of respondents as they asserted that they had not thought much about these issues when working with digital technologies.

Rimba Celik: Floor Mat Game

Rimba Celik was a floor mat game that was developed as part of digital media literacy with a focus on good and poor practices for young people.
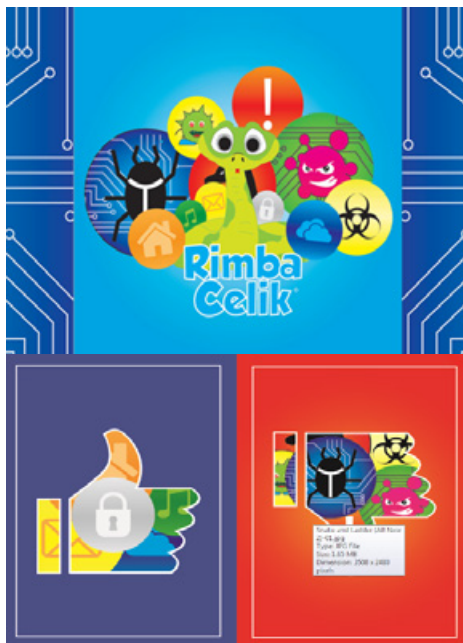
Figure 6: Rimba Celik- a floor mat game on digital media literacy with Apps and Virus Cards

Inspired by the ideas from the *Snakes and Ladders* game, *Rimba Celik* was designed to raise awareness on numerous issues related to hate speech, inappropriate behaviour and good media practices. Each respondent was asked to throw dices to move themselves as pawns in this game. Upon landing on virus squares, respondents had to draw cards, read the instructions and learn about negative online scenarios and move backwards

accordingly as stated in the instruction card. When respondents landed on the apps squares, they learnt about positive online scenarios and moved forward in the game as stated in the cards.
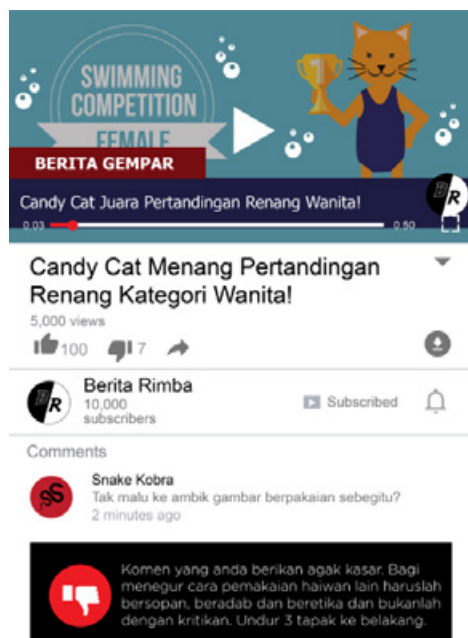
Figure 6: Rimba Celik- a floor mat game on digital media literacy with Apps and Virus Cards

Figure 7: Respondents in schools learning about digital media literacy through the Rimba Celik, floor mat game.

Testing and Feedback of *Rimba Celik'* - Floor Mat Game

The most significant matter that the respondents had learnt from the *Rimba Celik* game was about respecting each other e.g. having cordial ethnic relations and opinions, and avoiding racist comments. Respondents noted that they also have learned new knowledge and new words. Other new significant things that the students have learned was knowing the good and the bad things of the internet (e.g. do not upload pictures without the permission of the owner; be wary of online scammers; stop insulting other people; and being mindful about multicultural contexts that require understanding).

Digital Media Literacy Toolkit

The media literacy toolkit is one that will include Generasi Digital interactive comics and a Rimba Celik floor mat game for young people in secondary schools. It can be said that the media literacy toolkit is distinctive as it carries a Malaysian outlook. Further, the toolkit

development was based on research evidences where the materials were tested with Malaysian young people.

The goal of the project was to develop a toolkit that could be used for enhancing media literacy practice that emphasises good practices. The study revealed that the digital media literacy initiatives using the toolkit developed in this study successfully opened spaces in schools where thinking about media practices were inculcated and knowledge was created, explored and connected through a number of gaming activities. Thoughtful interpretation of media routines were conducted as respondents explored different concepts and engaged with numerous issues on digital media literacy.

CONCLUSION

The study explored the competences of young people related to five domains of media practice. Young people were asked to self-assess their media literacy skills and many of them stated that while they felt capable with some operational and safety related competencies, they however, encountered difficulties with content creation and problem-solving activities. This indicated that the young people face problems in working with different forms of media and communication, specifically in creating the messages they're sending in online environments.

As young people evaluate media, they need to plough through factual and fake information as well as fiction to decide whether the messages make sense; why certain information was included, and other parts of information left out; appreciate different perspectives in interpreting social reality; and understand the importance of responsible content creation as messages have impact in communities.

Media literacy programmes movements that were explored appeared patchy with different types of goals and objectives. The outreach of these groups was limited and not much was known about the assessment measures of these projects. The development of media literacy as advanced in the toolkit was deemed important, but respondents also raised anxiety about making digital media literacy as a formal subject, with conventional teaching and learning methods that entailed memorising of facts and values as prevalent

in our education systems in schools today. A strong policy agenda, engaging different stakeholders is needed to actively back digital media literacy at the national level and this has to be supported with efficient and sufficient financial support.

There are five important issues that arise from here:

- The need for policy and practical measures to promote dialogue across academic, policy, industry and citizen stakeholders;
- The need to set up a Malaysian Digital Media Literacy Expert group, comprised of lecturers from private and public universities to promote efforts and projects across Malaysia;
- The need to develop digital media knowledge and competences with effective pedagogy, appropriate curriculum and materials;
- The need to design knowledge content for media literacy at different levels, development of toolkits, specifically the design of online modules and gaming strategies, adequate resources, technical and institutional support and assessment measures are areas which need serious attention;
- The need to enhance the capacity for teachers/facilitators to teach media literacy.

Many young people today have grown up around smart phones, computers, touch pads and the internet and often, they are quite confident in the ways they manage the information presented to them. More than just not understanding the technical aspects of social media and information sharing, it is suggested here that the respondents were probably unaware of the biases inherent in the information they search, create and communicate in a fast evolving media world.

The notion that digital natives are not digital literates is one that we have to consider seriously. A piece of information found on the internet is just part of a bigger multi-dimensional story and young people need to know how to find alternative readings if they are going to be intellectually prepared for study, work and effective global citizenry in a digital world.

Online and offline spaces are in fact closely linked requiring positive regulatory measures. Digital media literacy policies, engaged policy actors and, especially, resources have to be addressed to empower young people in manoeuvring new media technologies in productive ways. The attention on young people, of course, means the role of the school is crucial and digital media literacy could reach them if the political will existed.

The work on digital media literacy so far is a testimony for MCMC's keen interest in cultivating young people's intellectual and creative curiosity through media literacy. The dialogue, policy support and research activities must continue to create a robust learning environment where young people can access, understand, evaluate, collaborate and create their media lifeworld experiences in a more holistic way.

NMRCP
Networked Media Research Collaboration Programme

RECOMMENDATION

In accordance with the findings of this study, it is recommended that:

- MCMC takes the lead in a large scale action to address the digital media literacy agenda by advancing a policy to give this effort a more structured place in the Malaysian landscape. MCMC will fuel the policy debate and bring stakeholders together to improve the framework conditions for literacy through the Commission's Recommendation on Digital Media Literacy.

- A Malaysian Digital Media Literacy Expert Group, comprised of lecturers from private and public universities be set up. There is a need for a unit to be leading and delivering research, turning policy into practice measures that include mapping initiatives, updating inventory, designing training programmes and pedagogical interventions in the area of digital media literacy. As digital technologies and new media experiences change, continuous work on online modules and gamification strategies must be given to enhance knowledge in this area. There is a need to sustain interest and action on expanding competences and measurement frameworks, creating engaging and fun-based conventional and digital content to empower young people.

- MCMC includes the interactive comics and floor mat games developed in this study in their roadshow activities to build awareness and understanding on core concepts of digital media literacy. Focus should be given to experiential learning which recognises young people's stories and reflection. It is also important to create opportunities for young people so that they can exercise choice and autonomy in appropriate ways through simulated experiences and reflective questions.

- MCMC supports digital media literacy with resources and grants to underserved communities and special populations in Malaysia.

- MCMC collaborates with MoE to create pathways for discussion on injecting digital media literacy in school settings. In addition, an annual conference on digital media literacy and student showcase competition can be organised to increase interest and national leadership in digital and media literacy.

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Klik Dengan Bijak (Click Wisely):

Safeguarding Youth in the Digital Age

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ABSTRACT

To address the various concerns that come with high levels of internet usage, the Malaysian Communications and Multimedia Commission (MCMC) launched the "Klik dengan Bijak" (KDB) campaign in 2012. This campaign promotes safety, security and responsibility in dealing with the internet. Despite MCMC's efforts, cybercrime is still rampant in Malaysia. It is therefore necessary to take a closer look at the programme. This research investigated five dimensions of the KDB programme: Effectiveness of the KDB programme and videos, understanding the issue of online risks from the perspective of the youth, KDB content that has been disseminated to the public, and the methods employed in media reports on the KDB programme. Concept of peer influence, cognitive developmental theories, Social Norm theory, persuasive techniques, Basic Human Values theory, and framing theory were tested. Methodologies employed were experimentation, longitudinal surveys, focus group discussions, and content analyses. Results show that the KDB programme was ineffective. However, the KDB videos were effective in educating participants on online safety. This may be because the value most present in the KDB printed materials and videos is about safety. The youth were found to understand online risky behaviours, but this did not deter them in indulging in such behaviour. Most of the KDB content was informative in nature.

Keywords: Klik Dengan Bijak, online safety campaign, online risky behaviours, social networking, youth.

INTRODUCTION

All age groups are affected by the introduction of new media. However, the youth tend to gain most attention in academic research due to the nature of this developmental period. Dahl (2004) noted that there is a strong association between adolescence and the increase of risk taking and sensation seeking. The gravitation towards reckless behaviour is likely due to their behaviour which is emotionally influenced. Steinberg (2007) in his study posits that adolescence is a time of increased vulnerability for risky behaviour.

The introduction of the internet has brought many benefits. Unlike traditional media, the internet as the current new media is interactive in nature. The youth can participate in creating and disseminating information (Madden, Cortesi Gasser, Lenhart, and Duncan, 2012). It also serves as a platform for connecting with people, both friends and strangers alike.

In order to understand the usefulness of the new media and the dangers it presents to the youth, various agencies all around the world have organised safeguarding programmes (e.g., UNICEF, the British Council, Child Hope). In Malaysia, MCMC launched the "Klik dengan Bijak" (KDB) campaign in 2012 to promote safety, security and responsibility by educating the youth, their parents, educators and society on how to protect oneself online, the dangers of frauds and online scams, as well as cyber threats.

Problem Statement

In 2019, Malaysia ranked top five in the world for mobile social media penetration (Bernama, 2019, January 31). It was reported that in 2018, there were 12.57 million Facebook users in this country (Statista, 2018). This number is expected to reach 15.87 million by 2022. This means that more than half of the Malaysian population will be on Facebook in the near future. The overwhelming increasing popularity of social media has also come together with the spread of cybercrime in Malaysia (Saizan & Singh, 2018). These cases are attributed to the types of cybercrime that arise from social media usage such as cyber spying, phishing, and scams.

MCMC has invested a lot of effort in the KDB campaign to educate Malaysians on online safety. Nevertheless, the number of cybercrimes has not declined. Despite MCMC's efforts, cybercrimes involving RM67.6 million in losses had been reported in the first quarter of 2019 (Bernama, 2019, May 13). Cybercrimes that have taken centre stage include scams, credit card frauds, identity thefts, and data breaches. Numbers have been increasing every year since 2012 which was reported at RM96.1 million (Ramendran, 2016, April 26).

It is therefore necessary to take a closer look at the programme. This research set out to investigate several dimensions of the KDB programme, including the effectiveness of the KDB programme and KDB videos and understanding the issue of online risks from the perspective of the youth. This study also investigated the content of the materials from the KDB programme that have been disseminated to the public as well as investigated the content and methods employed in the media reports on the KDB programme.

LITERATURE REVIEW

Risky Behaviour on the Internet

Adolescents have always been known to be excited to adopt new technologies compared to any other age groups. In this day and age, this is reflected in their use of the internet. The excitement and the novelty of any new media contributes to this eagerness. What makes the internet even more compelling is its anonymity, accessibility, and asynchrony (Valkenburg & Peter, 2011).

Risky online behaviour include hacking, downloading illegal content (Livingstone & Bober, 2004), providing personal information (Youn, 2005), and meeting someone face-to-face who was first met online (Liau, Khoo, & Ang, 2005). Scholars have also shown this extends to risky sexual behaviours (Ybarra et al., 2007) which entails the exchange of intimate, sexually insinuating information or material with someone known online.

Online Risky Behaviours of Malaysian Youth

Over the years, researchers have discovered that Malaysian youth are not spared from online risks. There are ample studies that confirm the online danger sentiment. A study conducted by Mak, Lai, Watanabe, Kim, Bahar, Ramos, Young, Ho, Aum and Cheng (2014) showed that of 969 Malaysian youth that they surveyed, although 96.6 percent have attended an internet safety course, 24.8 percent admitted to giving their password to a friend or someone they know. Additionally, almost 20 percent reported having sent an email or instant message to someone they never met before. A study by Marret and Choo (2017) found that the most common online risky behaviour of Malaysian youth is interacting with strangers. They also found that a majority of the youth that were sampled had experienced online victimisation such as online harassment and unwanted sexual solicitation. Also, the study of Teimouri, Hassan, Bolong, Daud, Yussuf and Adzharuddin (2014) shows that when online, the youth were susceptible to unwanted exposure of pornography and bear the potential risk of seeing violent images. A later study by Teimouri, Hassan, Griffiths, Benrazavi, Bolong, Daud, and Adzharuddin (2016) confirmed this finding.

The long hours spent on the internet in general and social media specifically by Malaysian youth is something to worry about among educators, parents, and policy makers. However, the study of Soh, Chew, Koay, and Ang (2018) found some enlightening solutions. They suggest that although peer attachment competes with parent attachment in influencing teenagers online risky behaviours, nevertheless, parental influences is stronger when they actively mediate their children's online activities.

Klik dengan Bijak (KDB) Programme

KDB takes a holistic approach towards awareness and education by promoting a shared culture of responsibility with families, schools, industry, government, and others in the community (About Klik dengan Bijak, 2014). All parties need to play their part to promote positive use of the internet. It specifically targets groups that are most vulnerable to threats and risks related to the internet such as children and their caregivers (parents and guardians) and the youth who are heavy users of internet. KDB incorporates

the values enshrined in our *Rukun Negara* and its main themes are to promote safety, security, and responsibility among internet users.

> The objectives of the KDB programme are as follow:
> - Generate literate users of technology and new media content.
> - Create a sense of responsibility among internet users to be ethical and sensitive to other users.
> - Educate internet users about the importance of self-regulation
> - Create a safe environment for the users of the internet.

KDB consists of several topics: cyberbullying, hacking, online grooming, online fraud, oversharing, rights and responsibility of online citizens, phishing and spam. A complete KDB programme is a full day event that consists of talks, games, and exhibitions. Brochures, bookmarks, booklets, Facebook, Instagram, stickers, postcards, and YouTube videos are all utilised to spread KDB messages during the programme.

Several theories and concepts corresponding to the above issues are applied. Among them is the concept of peer influence. This concept suggests that the perceived behaviour of peers is more important than the actual behaviour (Arnett, 2007; Iannotti & Bush, 1992). It is pertinent in explaining adolescents' decision to indulge in risky behaviour. Peer influence and cognitive development theories are similar in the sense that the interpretation of the environment influences behaviour and not the actual environment (Iannotti & Bush, 1992; Inhelder & Piaget,

1958). Additionally, Social Norm Theory is linked to the concept of Peer Influence and Cognitive Developmental Theories. This theory suggests that behaviour is influenced strongly by perceptions of behaviour and social group norms, even if this perception is incorrect (Scholly, Katz, Gascoigne & Holck, 2005). Adolescents who perceive that many of their friends engage in illegal downloading of movies online may believe that this is a socially acceptable behaviour and therefore is more willing to engage in this behaviour themselves.

The study also applied the five well-known persuasive techniques which are bandwagon, glittering generalities, card stacking, positive emotional appeal and negative emotional appeal. Previous studies have applied these techniques to test how they contribute to online behaviour (e.g., bandwagon [Kim & Sundar, 2014], glittering generalities and card stacking [Wright & Bachmann, 2015], positive and negative emotional appeal (Alhabash, McAlister, Hagerstrom, Quilliam, Rifon, & Richards, 2013).

The bandwagon persuasion technique refers to the act of encouraging people to join an opinion, behaviour or action that is considered favourable and therefore considered acceptable by a group or society. Glittering generalities refer to a virtuous quality such as dignity or honour (Wright & Bachmann, 2015). Card stacking refers to an act that uses facts and figures to support an argument, whereas emotional appeal is a persuasion appeal that can evoke either positive or negative feelings.

Other theories that were applied in this study include Basic Human Values (BHV) which seeks to understand the types of

values that exist in the KDB materials. This theory was established by Schwartz (1992, 1994). Values are important because they can explain peoples' behaviour and their underlying motivation for behaving in a certain manner. Being exposed to values may also affect people's behaviour. According to Bada, Sasse, and Nurse (2015), the manner in how messages are delivered to the people is contingent upon their local culture. The ten main values investigated in this study are: power, achievement, hedonism, stimulation, self-direction, universalism, benevolence, tradition, conformity and security.

Finally, the study also applied the news frames theory. News frames refer to highlighted aspects in the news coverage of events by stressing on certain features of a story and reducing complex issues to one or two aspects (Nelson, Clawson, & Oxley, 1997). This means that instead of reporting an event in its entirety with descriptions on every detail, frames simplify an event by taking a certain angle that is deemed to be of interest to the public, based on the journalists' best judgment (Waheed, Schuck, Neijens, & de Vreese, 2015).

Two fundamental types of frames are episodic and thematic frames (Gross, 2008; Iyengar, 1991). Episodic frames depict issues in terms of specific events and concrete instances (Iyengar, 1993), such as the experience of a victim of cyberbullying or a victim of online scams. It tells a story in a more personal manner. For example, it will include interviews with the victims. This will make the story more relatable and personable to media consumers. On television, episodically framed news is found to be more appealing. Gross (2008) posits that episodic news may draw readers into the story because it may contain elements of emotions in it. According to Hart (2010), people will often rely on their emotions to form their opinions.

Thematic frames, on the other hand focus on issues in a broader context by presenting collective evidence (Iyengar, 1993), such as the rise in cybercrimes and the increase of cyberbullying cases in Malaysia.

METHODOLOGIES

Different research methodologies were designed and executed to achieve the individual objectives in this research. To achieve the first objective of evaluating the effectiveness of the KDB programme, an experimental study was designed. A questionnaire survey was created by adopting and adapting questions from the works of previous scholars. Their level of knowledge was based on eight KDB topics that were all addressed in the programme: Cyberbullying, Hacking, Online Grooming, Online Fraud, Oversharing, Phishing, Rights and Responsibilities of Online Citizens and Spam.

Two types of comparisons were done: 1) testing of the level of knowledge of participants from the experimental group before and after exposure to the KDB programme, and 2) testing of the level of knowledge of participants from the control and experimental group after the KDB programme.

To achieve the second objective of evaluating the effectiveness of the KDB videos, a longitudinal experimental survey was conducted. This was conducted by comparing the level of knowledge of the participants before exposure to KDB videos, immediately after exposure to the videos, and 3 months after the exposure. The same participants were used in all 3 time points of the study. The effectiveness of the videos was based on 4 topics that were addressed in the videos: 1) Online Fraud addressed by the video entitled *"Penipuan Internet"*, 2) Oversharing, addressed by the video entitled *"Berkongsi secara Berlebihan"*, 3) Phishing, addressed by the video entitled *"Penipuan Internet"*, and 4) Rights and Responsibilities of Online Citizens addressed by the video entitled *"Maklumat Palsu"*. Similar to the first study, a questionnaire survey was created by adapting from the works of previous scholars. The same questionnaire was used at all 3 time points of data collection.

For the third objective, which is to understand the issue of online risks from the perspective of the youth, a Focus Group Discussion (FGD) was conducted among youth from Sabah, Sarawak, and Peninsular Malaysia from urban and rural schools. The FGD took the form of a semi structured discussion where the questions asked to the participants were pre-set based on the theories and concepts of cognitive development theory, peer influence, and social norm theory. Despite the pre-set questions, interviewers had to remain flexible in diverting topics or changing topics based on the current state of the discussions. This allowed for a more diverse discussion and a richer data set.

To achieve the fourth objective of investigating the content of the information disseminated to the public, content analysis was conducted. MCMC provided the researchers with the printed KDB materials which included brochures, pamphlets, postcards, and stickers. The researchers created two codebooks that enabled the content analysis to be conducted; one was designed to investigate the contents of materials and the other codebook was designed to extract information from the KDB videos that have been published on YouTube and Facebook. Upon the completion of the codebook, two coders were hired to do the coding. After undergoing intensive training sessions, an inter-coder reliability test was conducted to test whether the understanding of each item in the codebook are at acceptable levels. The inter coder reliability reading for all sections in both codebooks were above 80 percent, which is considered an acceptable level. Since the results were satisfactory, the coders proceeded to code the remaining materials.

Another codebook was created to achieve the fifth objective: investigate the content and methods employed in the media reports on the KDB programme. The same coding procedures were conducted. This codebook contained instructions on how to extract information on the presence of frames, and values attached to those frames in the media news reports.

FINDINGS

Objective 1: To evaluate the effectiveness of the KDB programme

When comparing the level of knowledge of the experimental group before (T_1) and after (T_2) exposure to the KDB programme, results show that there were significant improvements for the topics of Hacking and Online Grooming. There were no significant changes for the topics of Cyberbullying, Online Fraud, Phishing, Rights and Responsibilities of Online Citizens and Spam. Surprisingly, significant deterioration was found for the topic of Oversharing.

Table 1: Comparing the level of knowledge of experimental group before (T1) and after exposure (T2) to the KDB programme (n=68)

No.	Topic	Summary
1	Cyberbullying	No significant change
2	Hacking	Significant improvement
3	Online Grooming	Significant improvement
4	Online Fraud	No significant change
5	Oversharing	Significant deterioration
6	Phishing	No significant change
7	Rights and Responsibilities of Online Citizens	No significant change
8	Spam	No significant change

When comparing the level of knowledge of the control group and the experimental group after exposure to the KDB programme, results show that the level of knowledge was significantly higher for participants in the experimental group for the topics of Hacking and Spam. All other topics showed no significant differences between the two groups.

Table 2: Comparing the level of knowledge of the control group (n=31) with the experimental group (n=68) after exposure to the KDB programme (T2)

No.	Topic	Summary
1	Cyberbullying	No significant difference
2	Hacking	Experimental Group significantly higher
3	Online Grooming	No significant difference
4	Online Fraud	No significant difference
5	Oversharing	No significant difference
6	Phishing	No significant difference
7	Rights and Responsibilities of Online Citizens	No significant difference
8	Spam	Experimental Group significantly higher

From the results, it can be concluded that the programme was effective only for the topic of Hacking. The other 7 topics addressed in the KDB programme (Cyberbullying, Online Grooming. Online Fraud, Oversharing, Phishing, Rights and Responsibilities of Online Citizens, and Spam) were found to be ineffectively addressed. In general, it can be concluded that the KDB programme was ineffective.

Table 3: Summary of findings for the experimental study

No.	Topic	Experimental Group T_1 vs. T_2	Control Group vs. Experimental Group in T_2	Summary of KDB Programme
1	Cyberbullying	No significant change	No significant difference	Ineffective
2	Hacking	Significant improvement	Experimental group significantly higher	Effective
3	Online Grooming	Significant improvement	No significant difference	Ineffective
4	Online Fraud	No significant change	No significant difference	Ineffective
5	Oversharing	Significant deterioration	No significant difference	Ineffective
6	Phishing	No significant change	No significant difference	Ineffective
7	Responsibilities	No significant change	No significant difference	Ineffective
8	Spam	No significant change	Experimental group significantly higher	Ineffective

The study also found that participants' perception towards the KDB programme was more positive than negative. They believed that the most effective method of relaying KDB messages was through YouTube videos, followed by lectures and exhibitions. They perceived the KDB reading materials and interactive activities such as online quizzes to be the least effective methods. From this, it can be said that these youngsters were more inclined to prefer teaching methods that would allow them to be passive receivers. They disliked teaching activities that required effort on their part (i.e., reading and interactive activities).

Objective 2: To evaluate the effectiveness of the KDB videos

Results from the longitudinal survey shows that for the topic of Online Fraud, the video addressing this topic (*Penipuan Internet*) was found to be effective at maintaining participants' level of knowledge on this topic irrespective of group division. Over an extended period of time, the video brought many significant improvements to more than half of the tested groups.

In general, based on the summary of level of knowledge before exposure to the KDB videos and 3 months later (T_1-T_3), the video was able to bring significant improvement to the level of knowledge among participants from urban schools, from Sabah, and those in the late adolescence group. The video was more successful at increasing the level of knowledge after an extended period of time, rather than a short period of time.

		Overall (n=1,218)	Urban (n=538)	Rural (n=680)	Sabah (n=303)	S'wak (n=142)	P.Msia (n=773)	Early Adol. (n=482)	Late Adol. (n=736)
Short	$T_1 - T_2$								
Extended	$T_2 - T_3$								
General	$T_1 - T_3$								

Figure 1: Summary of findings on Online Fraud

For the topic of oversharing, the video addressing this topic (*Berkongsi secara Berlebihan*) was found to be effective in maintaining participants' high level of knowledge. The effectiveness of the video was equal over a short period of time and over an extended period of time. Two groups (urban and Sabah) struggled after the initial exposure to the video, but over an extended period of time, they were able to make sense of the lesson and significantly improve their level of knowledge. Interestingly, the level of knowledge of participants in the late adolescence group remained unchanged throughout all the time point comparisons. Groups that benefited the most from this video are the participants from urban schools and those from the early adolescence age group.

		Overall (n=1,218)	Urban (n=538)	Rural (n=680)	Sabah (n=303)	S'wak (n=142)	P.Msia (n=773)	Early Adol. (n=482)	Late Adol. (n=736)
Short	$T_1 - T_2$								
Extended	$T_2 - T_3$								
General	$T_1 - T_3$								

Figure 2: Summary of findings on Oversharing

For the topic of Phishing, the video addressing this topic (*Penipuan Internet*) was found to be overall effective by significantly improving the knowledge levels of participants over a short period of time. Over an extended period of time, the finding became complicated as some groups showed significant deterioration in their level of knowledge. The effectiveness for the level of knowledge over an extended period of time was bad. Generally, this topic was well addressed for participants in 3 groups (urban, Sabah, and Sarawak). The topic effectively maintained the high level of knowledge in 2 groups (early and late adolescence) but was ineffectively addressed in 2 groups (rural and Peninsular Malaysia). Across all time points, this topic was effectively addressed among participants from urban schools as the results showed a significant improvement for them at all time point comparisons.

		Overall (n=1,218)	Urban (n=538)	Rural (n=680)	Sabah (n=303)	S'wak (n=142)	P.Msia (n=773)	Early Adol. (n=482)	Late Adol. (n=736)
Short	$T_1 - T_2$								
Extended	$T_2 - T_3$								
General	$T_1 - T_3$								

Figure 3: Summary for findings on Phishing

● Effective ● Ineffective ● Maintain

For the topic of Rights and Responsibilities of Online Citizens, the video addressing this topic (*Maklumat Palsu*), was found to be effective in maintaining participants' level of knowledge over a short period of time. It significantly improved their level of knowledge, irrespective of group division over an extended period of time. Looking at the information in Figure 4, the lesson conveyed in the video did not immediately bring significant improvement. Over a short period of time, the level of knowledge of participants were effectively maintained at a high level. The video was more effective over an extended period of time compared to over a short period of time as it brought about even more significant improvements. Generally speaking, this video was effective, and has brought the most amount of significant improvements to almost all groups tested compared to the videos on *Penipuan Internet* and *Berkongsi secara Berlebihan*.

		Overall (n=1,218)	Urban (n=538)	Rural (n=680)	Sabah (n=303)	S'wak (n=142)	P.Msia (n=773)	Early Adol. (n=482)	Late Adol. (n=736)
Short	$T_1 - T_2$								
Extended	$T_2 - T_3$								
General	$T_1 - T_3$								

Figure 4: Summary for the findings on Rights and Responsibilities of Online Citizens

In testing the overall effectiveness of the KDB videos, participants' level of knowledge before exposure to the KDB videos was compared with their level of knowledge 3 months after exposure. It can be seen that the KDB videos were effective in addressing the topics of Online Fraud and Rights and Responsibilities of Online Citizens. They were also effective in maintaining the level of knowledge of participants on the topics of Oversharing and Phishing.

	Overall (n=1,218)	Urban (n=538)	Rural (n=680)	Sabah (n=303)	S'wak (n=142)	P.Msia (n=773)	Early Adol. (n=482)	Late Adol. (n=736)
Online Fraud								
Oversharing								
Phishing								
Responsibility								

Figure 5: Summary of findings on the effectiveness of the KDB videos before exposure to the KDB videos (T_1) and three months after exposure (T_3).

Groups that gained the most were participants from urban schools and participants from Sabah. In general, it can be concluded that the videos were effective in educating the participants.

● Effective   ● Ineffective   ● Maintain

Objective 3: To understand the issue of online risks from the perspective of the youth

The study on understanding the issue of online risks from the perspective of the youth shows that most, if not all youth from urban areas have access to smartphones and computers. Therefore, chatting with online friends on a daily basis is a norm.

Table 4: Demographic Information of FGD Participants

Location		Male	Female	Race	Age (years)
Urban	Peninsular Malaysia	6	10	Malay	14
Rural	Peninsular Malaysia	6	10	Malay	13-14
Urban	Sabah	4	5	Malay, Chinese, Indian	16
Rural	Sabah	7	2	Bumiputra Sabah	16
Urban	Sarawak	20 (gender unspecified)		Bumiputra Sarawak	Information unavailable
Rural	Sarawak	10	8	Bumiputra Sarawak, Chinese	Information unavailable
Total		**88**			

The motivations for youth to use social media are for entertainment, to appear popular, to make genuine friends, and to discuss academic matters. Some youth display a vague understanding of risky behaviour online while most provided accurate descriptions, which are in line with the messages championed by KDB. However, this did not mean that they steered clear from indulging in online risky behaviour.

Many were found to have befriended strangers online because it increased their number of followers which in turn can increase the number of "likes" for their posts. Strangers with physically attractive profile pictures will have a higher chance of being added to the adolescents' friends list. Besides boosting their self-esteem, they revealed that they also confided in them. What remains unknown is the motivation of these strangers (i.e., malicious or genuine intent). Many from rural areas have either been victims of cyberbullying or know of people who have been cyberbullied. Meanwhile, some youths from urban areas have admitted to being cyberbullies.

There were differences in responses by the youth in urban and those from rural areas in terms of the level of openness, depth of understanding concerning online risks, handling of online risks, and being victims versus being perpetrators of cyberbullying. It was also discovered that most of the FGD participants had neither heard of nor participated in a KDB programme.

Objective 4: To investigate the content of the information disseminated to the youth

264 KDB textual materials were identified for this study. From the bulk of the materials examined in this study, 14 percent contained persuasive approaches while 86 percent did not. Where persuasive approaches were present, it was found that negative emotional appeal was the most present persuasive approach in the KDB textual materials followed by card stacking, glittering generalities, positive emotional appeal, and bandwagon.

Table 5: KDB materials

Materials	N
Facebook posts	228
Brochures	7
Stickers	6
Postcards	6
Booklet	1
Bookmark	1
Total of textual	249
Videos	15
Total of KDB Materials	**264**

Persuasive Approaches in KDB Textual Materials

- 62% Negative Emotional Appeal
- 16% Glittering Generalities
- 16% Card Stacking
- 1% Bandwagon
- 5% Positive Emotional Appeal
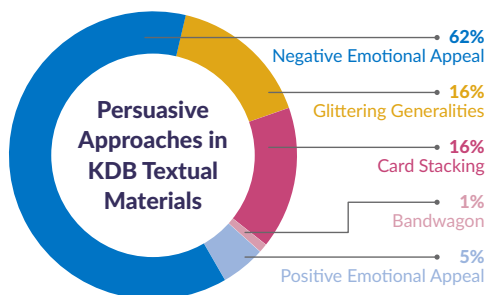
Figure 6: Persuasive approaches in KDB textual materials

For the KDB videos, it was found that negative emotional appeal was the most present persuasive approach, followed by glittering generalities and bandwagon. Card stacking and positive emotional appeal were absent in the KDB videos.

Figure 7: Persuasive Approaches in KDB Videos

Persuasive Approaches in KDB Videos

- 15% Bandwagon
- 22% Glittering Generalities
- 63% Negative Emotional Appeal
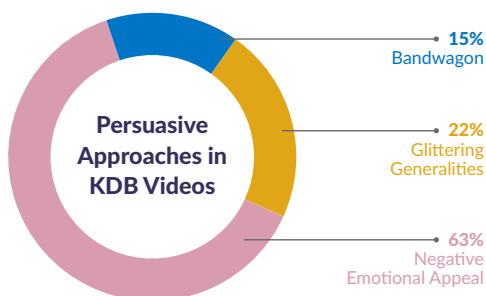
Meanwhile values that are most present in KDB textual materials were security, followed by benevolence, conformity, tradition, self-direction, universalism, stimulation, hedonism, power, and achievement.

Values in KDB Textual Materials (%)

Figure 8: Values in KDB textual materials

	%
Power	0.2%
Achievement	0.2%
Hedonism	0.9%
Stimulation	0.5%
Self-Direction	3%
Universalism	1.4%
Benevolence	84.8%
Tradition	5.4%
Conformity	24.1%
Security	90.8%

Values in KDB Videos (%)
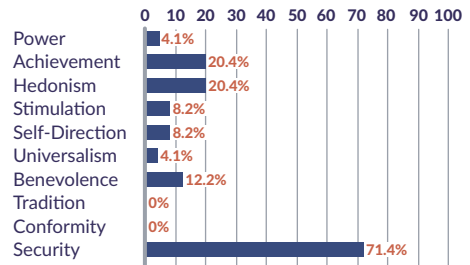
Figure 9: Values in KDB Videos

	%
Power	4.1%
Achievement	20.4%
Hedonism	20.4%
Stimulation	8.2%
Self-Direction	8.2%
Universalism	4.1%
Benevolence	12.2%
Tradition	0%
Conformity	0%
Security	71.4%

As for the KDB videos, the value that was most present was security, followed by achievement, hedonism, benevolence, stimulation, self-direction, universalism, and power. Tradition and conformity were not present in the videos.

Objective 5: To investigate the content and method of media reporting on the KDB programme.

Media reports on the KDB programme refers to textual publications in printed and online media outlets. Results show that KDB received the most amount of coverage from The Star (*n*= 22, 13.4%), Berita Harian (*n* = 21, 12.8%), and New Straits Times (*n* = 18, 11%). There was less coverage from Personal Blogs (*n* = 12, 7.3%), Utusan Malaysia (*n* = 10, 6.1%), Bernama (*n* = 7, 4.3%), and the least from Sin Chew Daily, Harian Metro, Kosmo, and Sinar Harian (*n* = 6 each, 3.7%). Most of the KDB coverage was positive (*n* = 125, 76.2%)
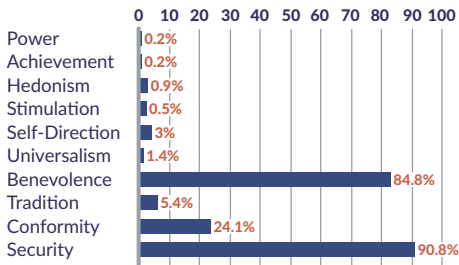
Topics in KDB Media Reports

Figure 10: Topics in KDB Media Reports

	%
Combination	54.9%
Cybercrimes	19.5%
Unidentifiable	14%
Think before sharing	6.7%
Taking Responsibility	2.4%
Cyberbullying	2.4%

Frames Employed in KDB Media Reports

- 40% Thematic
- 9% Episodic
- 7% Episodic & Thematic, but more Episodic
- 9% Equally Episodic of Thematic
- 35% Thematic & Episodic, but more Thematic

Figure 11: Frames Employed in KDB Media Reports

The frames employed in the media reports were largely thematic. On average, the news sources employed frames that were more thematic than episodic. This means that the media reports provided information in a more general manner by displaying statistics rather than by tapping into citizens' personal stories and emotions.

DISCUSSION

The investigation of the effectiveness of the KDB programme shows that only the topic of Hacking was effectively addressed in the KDB programme. The 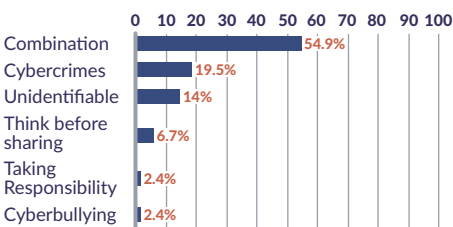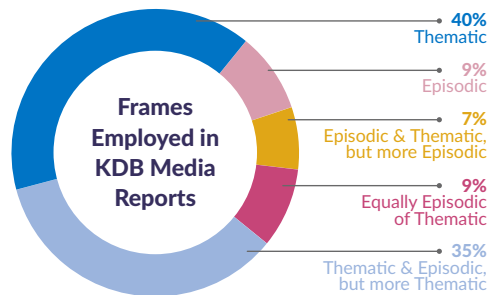other seven topics, Cyberbullying, Online Grooming. Online Fraud, Oversharing, Phishing, Rights and Responsibilities of Online Citizens, and Spam, were found to be ineffective. This means that overall, the KDB programme was ineffective.

The investigation on the effectiveness of the KDB videos, shows that the videos addressing Online Fraud and Rights and Responsibilities of Online Citizens were effective in increasing participants' level of knowledge. The videos were also effective in maintaining the level of knowledge on the topics of Oversharing and Phishing. Groups that had the most to gain were participants from urban schools and participants from Sabah. It can be concluded that the videos were effective in educating the participants.

The study that sought to understand the issue of online risks from the perspective of the youth found that motivations for youth to use social media are for entertainment, to appear popular, to make genuine friends, and to discuss academic matters. Some youth displayed a vague understanding of risky behaviour online while most provided accurate descriptions, in line with the messages championed by KDB. However, many were found to befriend strangers online because it increased their number of followers which in turn increased the number of "likes" for their posts. Many from rural areas had either been victims of cyberbullying or knew of people who have been cyberbullied.

The investigation on the content of the information disseminated to the youth shows that most of KDB's textual materials did not contain persuasive approaches. The situation was similar for KDB videos. This is an indicator that most of the KDB content was informative in nature. For both KDB textual materials and videos, the most present persuasive approach was negative emotional appeal. This could be an indicator that it is the Malaysian culture to educate by way of fear or guilt, both of which are concentrated on negative outcomes. The value most present in the KDB printed materials and videos is security.

Finally, the investigation on the content and method of media reporting on the KDB programme showed that individual topics that received the most amount of coverage is Cybercrimes, followed by Think before Sharing, and Taking Responsibilities for one's own Online Postings . The frames employed in the news coverage by sources who produced these reports were largely thematic instead of episodic. This means that most of the news was written in an impersonal manner, by presenting facts and figures instead of by incorporating personal stories that would evoke emotions.

CONCLUSION

The KDB programme was initiated by MCMC with the best of intentions. However, this study found that, save for the subject of Hacking, the programme was largely ineffective. The KDB materials that are disseminated to the public whether textually or online are more informative than persuasive, which may have contributed to its ineffectiveness in the target population. Also, the media reports on KDB strengthens the findings that most information disseminated are more informative than persuasive. Where persuasive content was used, the approach taken was to show negative emotional content, which could be a reflection of the Malaysian culture to educate through fear or guilt.

Of all the methods used to convey KDB messages presented to the adolescents, the KDB YouTube video was the most preferred, compared to teaching activities that required effort on their part. The most viewed videos were found to be effective either in terms of significantly improving the adolescents' level of knowledge on online safety, or in terms of maintaining their level of knowledge.

It was also discovered that the youth understand what risky behaviour is online. Despite this, they continue to indulge in such behaviour in efforts of increasing acceptance among peers which contributes to higher self-esteem.

Since the KDB programme tackles a very important area that is relevant and needs to be addressed, it is likely that MCMC will continue efforts to address concerns and negative issues that arise from high internet usage. Hence, it is important that the learnings and the recommendations from this study be taken into consideration when planning future initiatives.

RECOMMENDATION

Based on the five studies, several suggestions are made to improve the KDB programme. They are:

- To include more entertaining elements in the KDB lectures (e.g., jokes, graphics) to maintain participants' interest in the messages conveyed.

- To employ school teachers to either teach MCMC representatives effective methods of message delivery for school students or to provide the school teachers with the KDB content and have them deliver it to their own students as they are better at understanding their students' capabilities and level of understanding compared to MCMC representatives.

- To create videos that are more relatable to participants from rural areas since the setting of all KDB videos are in the urban areas.

- To increase publicity by conducting KDB programmes at schools consistently and frequently.

- To ensure that materials produced adhere to cultural preferences such as negative emotional appeal and to encourage MCMC representatives to produce media reports that emphasises on episodic framing by including excerpts of interviews with the public to increase relatability and increase readers level of interest on the issues discussed.

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Are Smartphones

Changing Human Interaction?
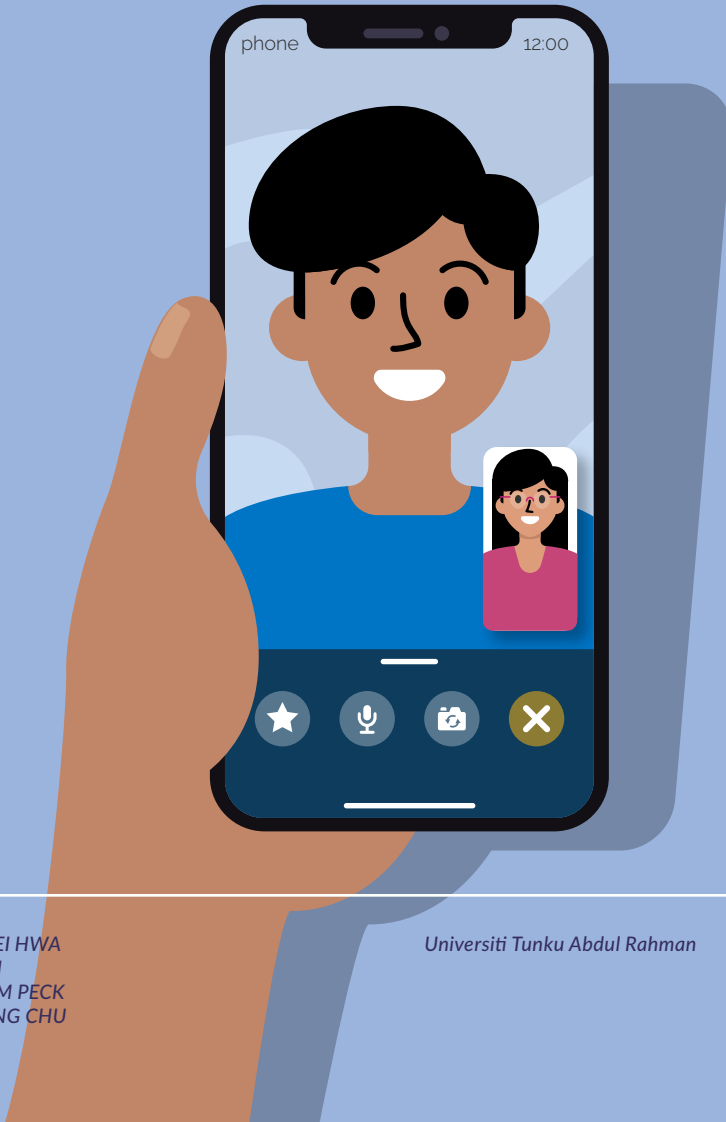
SIEW PEI HWA
LEE LI LI
WEE KIM PECK
WU MING CHU

Universiti Tunku Abdul Rahman

ABSTRACT

Against the current mobile communication technologies milieu, this study sought to analyse the technological communication patterns (or new communication technology habits) among young Malaysians, cutting across all types of new media, and smartphone usage patterns of young Malaysians aged 11 to 18 years old, and how the communication trends affect the young digital natives' familial and peer face-to-face social interaction. The research also aimed to study the perceptions of parents with children aged 11 to 18 towards the children's use of internet and smartphones, parents' concerns and issues as well as parental control methods. These issues include social skills and social anxiety. Data was collected through three research stages over a period of 15 months. Firstly, a self-administrated survey using a close-ended questionnaire was administered to 2,110 students aged between 11 to 18 years old in Malaysian primary and secondary schools in eight states including Sabah and Sarawak. Secondly, self-administrated surveys were distributed among 365 parents with children aged 11 to 18 years old from both West and East Malaysia. The third data collection method was focus group discussion with two sessions held with parents in Miri and Putrajaya.

INTRODUCTION

The advances in ICTs, especially smartphones have substantially altered the way humans interact. The utilisation of such technologies has increased dramatically over the past decade and most of the masses are indulged in its usage. Much of our communication is now online, much of our leisure and entertainment is provided by the internet, and many of us find our mobile phones have become an essential part of our connectivity and everyday organisation. Between email, texting, social networking, instant messaging, and Skype, people now have the resources that would make it possible to spend days or months without coming face-to-face with another person, and yet still remain connected with the world. With these changes in lifestyle, questions are arising about what technology may be doing to us.

As we spend more time on the internet, our socialisation with others face-to-face is clearly decreasing as well. With smartphones cheaply available now, many people, especially the youngsters, are spending most of their time on the internet, leading to a problematic behavioural phenomenon known as internet addiction. This has become a growing concern among adolescents around the world, and in Malaysia, it was reported to be at a critical stage, where many youngsters are suffering mental health problems due to the long time spent in front of computers and gadgets (Ling, 2015).

In addition, Srivastava (2005, p. 112) also reported on how the use of mobile phone has affected the structure and "closeness" within families. According to Srivastava (2005, p. 113), mobile phones connect people to the

outside world, and thus make them feel less lonely. However, Cilliers and Parker (2008) argue that the mobile phone has caused family members to diminish ties with each other and encourages the development of independence and individuality. Therefore, within the family, the adoption of the mobile phone has meant changes in power and control in the parent-child relationship because of increased freedoms as well as more social interaction in daily life.

Given the scenario, we undertake a survey to ascertain the technological communication patterns (or new communication technology habits) of young Malaysians. We looked into some of the issues related to the impact of smartphone on young people's social life, especially the impact of technological communication on the social interaction and the familial relationship. We also examined whether or not the participants who use technological communication more frequently or preferred it to face-to-face communication, would have lower social skills and high social anxiety.

In summary, the key objectives of this research are to: 1) identify the technological communication and smartphone usage patterns of young Malaysians in the digital age, 2) investigate impact of technological communication on the familial relationship among young Malaysians, 3) determine the impact of technological communication on the social interaction and engagement among young Malaysians, 4) examine the relationship between smartphone addiction and social skills among young Malaysians and 5) study the perceptions of parents with children aged

11 to 18 towards children's use of internet and smartphones, to understand parents' concerns and opinions about technological communication and methods of parental control.

LITERATURE REVIEW

The impact on device usage on youth have been much studied, centred around the young users, its impact on personal and familial relationships, addiction levels and social anxieties implications.

ICTs and Youth

Today's youth are different from any generation before them as Rosengren (1994) phrases: "...effects of changes in the media structure seem to reach young people more rapidly than old people". They are exposed to digital technology in virtually all facets of their day-to-day existence (Tapscott, 1998). Statista (2017) found that 93 percent of internet users in the age under 25 were accessing the internet daily; in more numbers than older age groups. In addition, the Department of Statistics Malaysia (2018) reported that individuals using internet aged 15 years and above in Malaysia rose by 9 percentage points to 80.1 percent in 2017, from 71.1 percent in 2015 (Alias, 2018; Department of Statistics Malaysia, 2018).

Impact of ICTs on Personal and Familial Relationships

The internet appears to play a prominent role in human communication (Gapsiso & Wilson, 2015). Nie and Ebring (2010 as cited in Brown, 2013) proved that the more time members of our society spend using the computer, the less time they spend in person with family and friends. This is supported by several studies (Cuber Atlas, 2000; Nie & Ebring, 2000 as cited in Gapsiso & Wilson, 2015) where the findings indicated that, the more people used the internet, the lonelier they felt and the less they engaged in interpersonal communication, even with their family members. Psychologists, teachers, and writers have theorised that we are becoming an "autistic society" that no longer values face-to-face interaction (Yehuda, 2001 as cited in Brown, 2013). Another researcher (Turkle, 2012) specifically examined the effects of technology on familial relationships. After interviewing more than 300 young people and 150 adults, Turkle found that children were often times the ones complaining about their parents' obsession with technology. Turkle discovered that many children believed their parents paid less attention to them than to their smartphones, often times neglecting to interact with them face-to-face until they had finished responding to emails, short messages and so forth.

Internet and Smartphone Addiction

Internet and smartphone addiction are not substance addictions; they are behavioural addictions (van Deursen et al., 2015, as cited in Lee, Lee & Lee, 2016) that are related to the way people use the internet and smartphones. Lee et al (2016) claimed that internet addiction and smartphone addiction have similar psychological and behavioural symptoms to other addictions, such as addiction to alcohol. Citing past studies; (Kuss et al., 2013; Widyanto, Griffiths, & Brunsden, 2011; Young, 1998), Lee et al (2016) pointed out the common symptoms of internet and

smartphone addiction are loss of control, preoccupation, withdrawal, orientation toward cyberspace to manage moods, and conflict or negative consequences.

Three characteristics of mobile phone addiction have been articulated by Roos (2001 as cited in Chen, 2006) below:

1) People who are addicted to mobile phone always keep their mobile phones on;
2) They tend to use their mobile phones even when they have a land-line phone at home; and
3) They normally are confronted with financial and social difficulties due to their excessive mobile phone use.

Social Anxiety

Social anxiety disorder, also known as social phobia, is a type of anxiety disorder characterised by excessive fear, anxiety, discomfort, and self-consciousness in social settings. Individuals with social anxiety disorder (social phobia) have a heightened fear of interaction with others in a variety of social interactions and worry they will be scrutinised by others (Shelton, 2019). A study by Brown (2013) examined the relationship between the use of technological communication and social skills in college students. A total of 112 male and female undergraduate students at Connecticut College were surveyed about their social skills, social anxiety, technology use, and technology preference. In general, the college students in this sample led extremely technologically dense lifestyles. The study proved that poor social skills are the motivating factor for a strong preference for technology use, and that overuse of technology is the consequence of social anxiety.

METHODOLOGY

Research Instrument

Two sets of self-administered survey questionnaires were developed: 1) A set of survey questionnaire to gain insights into how students value various smartphone applications and tools, their perceptions toward mobile communication, ae well as its impact on social interaction, familial relationship, social anxiety and social skills; and 2) A set of survey questionnaire for parents with children aged between 11 to 18 years old. In addition to surveys, focus group discussion (FGD) sessions had also been conducted among parents with children aged 11 to 18 years old. Parents were involved in the research merely to solicit information pertaining to their children's use of smartphone and some issues pertaining to mobile communication.

Sampling

For the category of students, the surveys were administered to 2,110 students aged between 11 to 18 years old (primary and secondary school students) who were recruited using a purposive sampling technique. Students aged 11 to 18 years old were selected due to the relationship of this generation with digital technologies. For the category of parents, the surveys were administered to 365 parents with children aged 11 to 18 years old who were recruited using the combination of convenience and snowballing sampling techniques. For the surveys, 165 student questionnaires (2,110 sets in total) and 12 parent questionnaires (365 sets in total) were removed due to failure to obtain complete results on the surveys or did not return. Hence, the response rate for the surveys was 92.2 percent and 96.7 percent respectively.

Data Collection

The surveys among the category of students commenced in schools from 14 November 2017, and were then continued in January through April 2018. The surveys were conducted in several schools in Malacca, Pahang, Penang, Perak, Negeri Sembilan, Selangor, Sabah and Sarawak.

A mixed method approach was employed among samples of parents with children aged 11 to 18 years old. In addition to survey questionnaire, qualitative FGD sessions were conducted to understand the parental control issues on smartphone use among their children. For the surveys, a total of 365 questionnaires were collected among parents from school teachers, parents, lecturers, their friends, and so forth through convenience and snowballing sampling techniques. Finally, two sessions of the FGD were held in February and May 2018 respectively at Miri Home Tuition Centre Sarawak and Pusat Internet 1 Malaysia, Presint 18 Putrajaya.

FINDINGS & DISCUSSION

Smartphone Usage Patterns Among Youth in Malaysia

To understand the smartphone usage pattern among Malaysian youth, the study looked into the demographic age of users, pattern of ownership of devices, time spend and location accessing internet. The summary of Malaysian youth smartphone usage is in the Figure 1 below. The internet is an integral part of the lives of young people in Malaysia, with most going online regularly to learn, keep in touch with friends and have fun. Born into an already web-connected world, many teens have been using the internet for the majority of their lives and fear not having access to the digital environment.
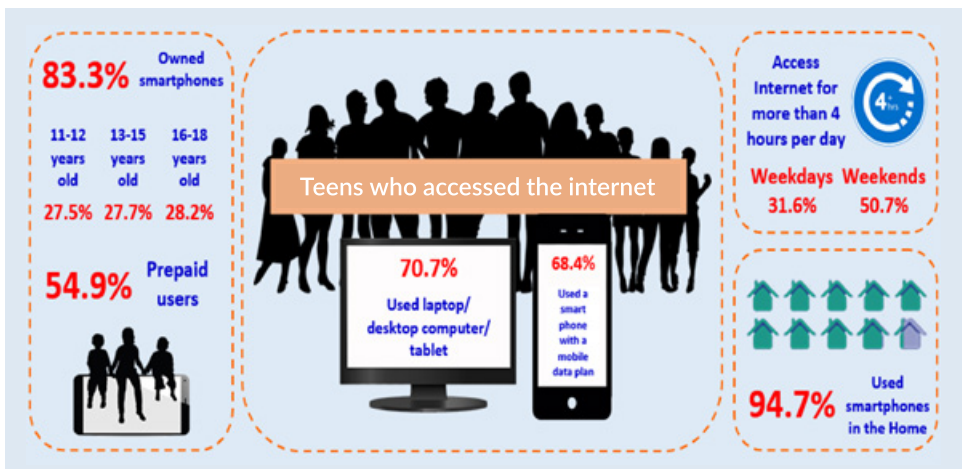

Figure 1: Smartphone usage pattern among Malaysian youth

The figure above indicates that 83.3 percent of Malaysian youth owned smartphones averaging about 28 percent for those aged 11-18 years old where almost 55 percent are prepaid users. With the accessibility of the internet, usage of devices is further enhanced where youth spend 32 percent of their time or more than 4 hours during weekdays and 51 percent of their time during the weekends. Almost 95 percent of the youth used their smartphones in their homes. These findings were also consistent with the responses gathered from the FGD sessions with parents where a majority of them reported that their children mainly engage in online leisure or recreation websites/applications to play online games and watch videos[1].

Smartphones and Youth

In trying to understand the impact of communication technologies on family and social relationship, the study analysed reasons for using smartphones among youth, factors that influence the smartphone purchase decisions and the behaviour problems faced by them.

i. *Reasons to use smartphone*

The majority of the students (80.5%) agreed that the smartphones give them more freedom because they could stay in touch with their parents and 78.3 percent agreed that they liked to use their smartphones to keep in touch with their friends regardless of where they were. Meantime, 77.7 percent agreed with the statement that when they felt bored, they used their smartphones to entertain themselves, and 76.9 percent agreed on the fact that they feel safer because they can always use their smartphones to get help. The results are consistent with past studies (e.g. Campbell, 2005; Chakraborty, 2006; North, Johnston & Ophoff, 2014; Sylvester, 2016). Campbell (2005) claimed that young people use the mobile phone to organise and maintain their social networks, as well as changed dynamics in the family, with issues of safety and surveillance from a parental perspective. According to Chakraborty (2006), when respondents were asked about the reasons for acquiring mobile phones, most of the respondents indicated the need to use to stay in touch with family and friends, and the need to use in case of emergency or personal safety. Sylvester (2016) indicated that regardless of their age, gender, and location, all study participants agreed that a mobile phone is an essential tool for keeping in touch with their loved ones.

Moreover, a high number of respondents (72.5%) felt that smartphones were useful and had become a necessary device in their lives. This should be a cause for concern as we do not want our children to be glued to their devices; hence the relevant ministries (e.g. Ministry of Youth and Sports) could make non-digital device activities or games more appealing. Local councils and relevant authorities could/should consider erecting more playgrounds, badminton courts, tennis courts, football fields, parks with nature trails.

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1   ICTs were classified into four categories as Social interactive technologies: Examples – emailing, instant messengers, online forums and chat rooms, Facebook, Twitter, etc User-generated content tools: Flickr for sharing images and YouTube for sharing videos. Materials, comments, ratings, and reviews added by users to Wikis, Blogging and websites can also be considered user-generated content; Mobile telephony: Mobile phone (voice call), mobile phone (text message), and mobile phone (Internet-Based Mobile Messaging – e.g. WhatsApp, WeChat, Line, Facebook Messenger, etc.); and Other online leisure or recreation activities such as online gaming, Podcast, etc.

Further, schools should incorporate more meaningful non-academic programmes like sports and cultural activities by way of setting up clubs and societies where students are active throughout the academic calendar. Having said that, teenagers need to also be taught self-control in order not to expose themselves to prolonged usage. Only a relatively smaller share of students (26.4%) claimed they got their own smartphones because most of their friends used smartphones, and had convinced them to get one. The findings also indicate age, gender, geographical locations, and household income differences as several reasons to take/use smartphones among students.

The research findings also reveal that, of the 353 surveyed parents, a majority (77.6%) of the parents indicated that they allowed their children to have a smartphone as a way to stay in touch with them no matter where they are. Over half of them noted that they want their children to have a smartphone for safety purposes, especially when their children are staying outside of the home alone or going to school. However, only 21 percent of the parents claimed to hand a smartphone to their children in order to monitor their location. The majority of the participants in the focus group discussion (FGD) sessions pointed out that they allowed their children to take/use smart (or mobile) phones as requested by school teachers. Some of them noted that smartphones were used in schools as requested by teachers for doing assignments, and communication among parents/children via group chats.

ii. Factors considered when purchasing smartphones

There are a variety of smartphones available in the market with unique specifications, features, and technologies. This study saw price to be the main factor that both students and parents consider when buying a smartphone. Results show that the top three factors affecting a smartphone purchase among the students were the price (71.1%), size of memory in the phone to store files (70.7%), and brand (68.4%). The findings are consistent with several past studies (e.g. Balakrishnan & Raj, 2012 as cited in North, Johnston & Ophoff, 2015; Lim et al., 2014; Pakola et al., 2010 as cited in Shanka, 2013; Saif, 2012 as cited in Shanka, 2013; Shanka, 2013). In addition, previous studies (e.g. Nagarkoti, 2009; Shanka, 2013; Shrestha, 2016; Zahid & Dastane, 2016) also reported that price factor had significant positive relationship with smartphone purchase. Brand had also been one of the influential factors in purchasing a smartphone (ranked as third highest response rate among students and second among parents). These findings are in line with past studies such as Lim et al. (2014), Shanka, 2013, and Shrestha (2016). Drawing upon the work of Balakrishnan and Raj, Karjaluoto et al. as well as Petruzzellis, North, Johnston and Ophoff (2015) noted that the three main considerations by Malaysian, Finnish and Italian university students when purchasing a mobile phone were found to be brand, trend and price.

A relatively smaller share of students think about appearance (26%) and accessories (23.5%) when buying a smartphone. For them, the factor that affected them to make a purchasing decision was more of a style factor than convenience. Similarly, only a smaller share of students (16.2%) think of the weight of a phone as one of the factors to consider when choosing a smartphone. In addition, research findings also indicate that 0.7 percent of the students reported other factors affecting a smartphone purchase such as waterproof (or water-resistant) phones (0.2%), and parents' decisions (0.5%). However, social influence seemed like not an influential factor when purchasing smartphones among surveyed students and parents. The findings of this research corresponds with past studies (Rahim et al., 2015; Lim et al., 2014; Shanka, 2013), but contradict with the study of Zahid and Dastane (2016).

iii. Behaviour problems related to smartphone usage

The research findings also indicate that the three top-ranked compulsive behaviour of smartphone users among the surveyed students were; switching off their phones only when the need arises such as studying in school, cinema etc.; always checking for missed calls or messages, and treating smartphone use as one of the most important thing done every day. Results show that over half of the students (52.3%) agreed with the statement that they only switch off their phone when the need arises such as studying in school, cinema etc., and 42 percent agreed that they always check for missed calls or messages.

Meantime, a total of 38.9 percent of the students agreed with the statement that using the smartphone is one of the most important things they do every day. A relatively smaller share of students (25.5%) claimed that they feel distressed when someone doesn't return their calls, 27 percent students indicated that they feel distressed when their phones are not with them, and 28.7 percent agreed that their smartphones made it more difficult for them to pay attention in class. Apart from that, the majority of the students (72.4%) reported that they had set auto lock with password on their smartphones, and about half of the students (50.1%) claimed that they had grown up in a household with rules limiting their smartphones and internet usage. Meantime, there were 32.4 percent students who noted that their parents had ever monitored their location through their smartphones. Surveyed students had also encountered several problems with regards to smartphone use, such as being in debt due to excessive smartphone use (43.5%), being harassed by someone else through their phones, either through voice calls or text messages (33.4%). Some have received sexually suggestive nude or nearly nude photos or videos of someone else, either knowingly or unknowingly, on their smartphones, but this was found not to be at a serious level. Only a smaller share of students (18.4%) admitted that they had exhibited behavioural problems such as sending pictures of others or text messages that if seen by their parents/guardians or school officials would get themselves in trouble, and use their smartphones in class without the teacher knowing.

This study finds that the surveyed students did not exhibit serious smartphone usage behavioural problems such as "abandon" their physical surroundings to interact with someone else through their smartphone or manage other things with your smartphone, use smartphone when walking/crossing the road, use smartphone while having meals, talk loudly on the phone even when they are in public, and have their parents/guardians take away their smartphones to discipline them. Since the mean score of each of the smartphone usage behavioural problems (the mean scores range from 0.42 to 1.35) and that of the compulsive behaviours of smartphone users (the mean scores range from 0.42 to 1.35) were not above 4 in 5-point Likert scale, it suggests that the participants are not serious compulsive users. The findings correspond with the study of Lee et al. (2014). The findings also indicate age, gender, geographical locations, and household income differences in smartphone usage behavioural problems and compulsive behaviour of smartphone users.

As for the parents, about half of the surveyed parents worried that their children might see sexually/violently explicit images on the internet. The parents of the FGD sessions also worried about the early exposure of their children to the pornographic websites. They also worried that their children might become a victim of online grooming, might give out personal/private information online, might get information about self-harm, suicide, anorexia, etc., and might become isolated from other people by spending too much time online. A relatively smaller share of parents indicated their worries about cyberbullying. Apart from that, there were some parents with worries that their children might neglect their studies due to spending too much time online for meaningless messaging using mobile messaging apps and becoming addicted to online games. Some of them worry about the problems of making bad friends or talking to strangers online. In addition, the parents who participated in FGD sessions also expressed concern about the issue of electronic nanny— TVs, video/online games, computers, smartphones, etc. to entertain children in the home. The participants also worry about uncontrollable social media such as Facebook.

Communications Technology Dependency and Impact on Relationships with Families and Society

To investigate the impact of the smartphone on youth social interaction (i.e. maintain and build social capital in school) and on family relationships, the research looked into; the degree of young Malaysians dependencies on mobile communication in their daily lives; the extent of mobile communication's impact on young Malaysians' familial relationship and the extent of mobile communication impact on the young Malaysians' social relationship. A 5 Likert scale questionnaire scale: 'Never' (1), 'Less often' (2), 'A few times a week' (3), 'At least once a day' (4), and 'Several times a day' (5) was used to measure the frequency of students' calls made, and texting for different purposes. The students were asked to tick the corresponding numbers (i.e.

1 – 5). The responses of the students were then recoded with 0=Never, 1=Rarely, 2=Sometimes (ST), 3=Frequently (FQ), and 4=Very Frequently (VFQ).

i. Dependency of Malaysian youth on communication technology

Table 1 reveals that over half of the surveyed students (1,043 students or 53.6%) had a low level of mobile communication (MC) dependency, followed by 527 of them (27.1%) who experienced a moderate level of MC dependency, and 259 students (13.3%) who did not depend on MC at all. Only 6 percent were highly dependent on MC.

Table 1: Frequency and percentage of students' total scores of frequency of mobile communication use and their level of mobile communication dependency

Total scores of FMCU	Level of MC dependency	Frequency	Percentage
≥ 33	High	116	6.0
22 – 32	Moderate	527	27.1
11 – 21	Low	1,043	53.6
< 11	Not at all	259	13.3

On average, the results indicate that the students had a low level of mobile communication dependency (the total of FMCU scores ranged from 11 to 21 points). It is apparent that the average participant experiences a 'normal' level of mobile communication, suggesting that the participants are not serious compulsive users. The findings correspond with the study of Lee et al. (2014). The findings also indicate age, gender, and geographical locations differences in the degree of mobile communication dependency. However, there were no statistical differences among students in terms of household income.

ii. Impact of mobile communication on Malaysian youth familial relationship

The familial relationship scale (FRS) uses a 5-point Likert scale with 10 items in Q13 in section B of the questionnaire for students, ranging from 'Strongly Agree' (5) to 'Strongly Disagree' (1) to measure the familial relationship among students. The FRS scores were calculated by simply summing up responses to each item. The total of FRS scores ranges from 10 to 50 points as shown in Table 2.

Table 2: Frequency and percentage of students' total scores of familial relationship scale and their degree of familial relationship

Total scores of FRS	Degree of familial relationship	Frequency	Percentage
≥ 40	Very Strong	400	20.6
30 – 39	Strong	888	45.7
20 – 29	Moderate	554	28.5
10 – 19	Weak	76	3.9
< 10	Very weak	27	1.4

A linear regression analysis was used to test the null hypothesis 1 ($H_0$1), which intended to study the impact of frequency of mobile communication use on familial relationship. Linear regression analysis is used when the value of a dependent variable (familial relationship) was predicted based on the value of an independent variable (the frequency of mobile communication use). The results are shown in Table 3.

Table 3: Regression results between the frequency of mobile communication use and familial relationship

Model Summary[a]				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	0.297[b]	0.088	0.088	7.699

ANOVA[a]					
Model	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1 Regression	11169.098	1	11169.098	188.439	0.000[b]
Residual	115164.940	1943	59.272		

Coefficients[a]					
	Unstandardised Coefficients		**Standardised Coefficients**		
Model	**B**	**Std. Error**	**Beta**	**F**	**Sig.**
1 (Constant)	28.502	0.445	0.297	64.081	0.000
Mobile Communication	0.301	0.022		13.727	0.000

a. Dependent Variable: familial relationship

b. Predictors: (Constant), the frequency of mobile communication use

An attempt was made to fit a regression model to the data collected from the survey among students and a significant linear relationship was observed between the frequency of mobile communication use and familial relationship. An R2 value of 0.088 was observed in this case. Since the R2 value is 0.088, approximately 8.8% of variation in the familial relationship was explained by the frequency of mobile communication use, which is very small (see Table 3). The strength of relationship can be expressed as;

Familial relationship = 28.502 + 0.301 (the frequency of mobile communication use). It can be concluded significantly that the frequency of mobile communication use has a positive impact on enhancing students' familial relationship.

iii. Impact of mobile communication on social relationships among youth

To see the impact of mobile communication used on social relationships among youth, the study uses a 5-point Likert scale with 10 items as listed in Table 4, ranging from 'Strongly Agree' (5) to 'Strongly Disagree' (1) to measure the social relationship among students. The SRS scores were calculated by simply summing up responses to each item. The total of SRS scores ranges from 10 to 50 points as shown in Table 4.

A linear regression analysis was also used to test the null hypothesis 2 ($H_0$2), which intended to study the impact of frequency mobile communication use and social relationship. The results are shown in Table 5. by fitting a regression model to the data collected from the survey among students, a significant linear relationship was observed

between the frequency of mobile communication use and social relationship. An R2 value of 0.151 was observed in this case. Since the R2 value is 0.151, approximately 15.1 percent of variation in the social relationship was explained by the frequency of mobile communication use, which is relatively small (see Table 5).

Table 4: Frequency and percentage of students' total scores of social relationship scale and their degree of social relationship

Total scores of SRS	Degree of familial relationship	Frequency	Percentage
≥ 40	Very Strong	290	14.9
30 – 39	Strong	812	41.7
20 – 29	Moderate	680	35.0
10 – 19	Weak	117	6.0
< 10	Very weak	46	2.4

Table 5: Regression results between the frequency of mobile communication use and social relationship

Model Summary[a]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.388[b]	0.151	0.150	7.815

ANOVA[a]					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	21083.102	1	21083.102	345.218	0.000[b]
Residual	118662.653	1943	61.072		

Coefficientsᵃ	Unstandardised Coefficients		Standardised Coefficients		
Model	B	Std. Error	Beta	F	Sig.
1 (Constant)	24.736	0.451	0.388	54.789	0.000
Mobile Communication	0.413	0.022		18.580	0.000

a. Dependent Variable: familial relationship
b. Predictors: (Constant), the frequency of mobile communication use

The regression model coefficient table shown in Table 5 provides the necessary information to predict social relationship from the frequency of mobile communication use. The B coefficients indicate how many units of social relationship increases for a single unit increase in each predictor (the frequency of mobile communication use). Regression equation on the relationship can be expressed as:

Social relationship = 24.736 + 0.413 (the frequency of mobile communication use)

Importantly, it is noted that the B coefficients are positive numbers; higher frequency use of mobile communication is associated with better social relationship. From the regression equation, it is observed that **the frequency of mobile communication use has a significant positive impact on enhancing students' social relationships**. Hence, there was strong evidence to reject the null hypothesis 2 (H02). There was a positive impact of the frequency of mobile communication use on social relationship.

The overall results proved that better parent-children relationships were fostered by the mobile phones. The devices also mediate strong links with friends and other community members. Smart (or mobile) phones enable the students to contact their family and friends anytime and anywhere in order to keep up with them, when they needed someone to talk to or be with as well as talk about their problems sometimes, and when they were concerned about them. In a nutshell, smart (or mobile) phones have improved the familial relationship and increased the "closeness" within families among the surveyed students. Likewise, it was found that the use of smart (or mobile) phones improves social cohesion and social relationships, Mobile communication fosters social interaction within friends among surveyed students. Through communication with family and friends on smart (or mobile) phones, they also feel less lonely and less tense, as well as get away from pressures and responsibilities.

Besides, the findings in this research that indicate a positive impact on family relationships are congruent with numerous past studies (e.g. Alderson, 2012; Khan, 2011; Liu & Leung, 2017; Tamme & Siibak, 2012). Apart from that, the findings that show a positive impact on social relationships yield similar findings to other earlier studies (e.g. Islam, Habes & Alam, 2018; Lee, 2009; Vidales-Bolaños & Sádaba-Chalezquer, 2017; Yang, Kurnia & Smith, 2011) which found that the use of mobile phones improves social cohesion and social relationships. In conclusion the present research and earlier studies with similar findings demonstrate that the mobile phone is often used to enhance social cohesion, especially by connecting their family members and friends. The mobile phone provided a direct and private communication channel between parents and children, and between users and close friends.

iv. Impact of mobile communication technologies on face to face communications

To discover if mobile communication technologies impact face to face communications, the study sought to first understand reasons for the appeal in technologies. And if so, whether it decreases the amount of time spent in engaging in face to face communication with families and friends. The key reason young Malaysians preferred to have mobile communication (or online communication) is that it is easier to communicate with

people that live far away; easier to get feelings across as they can use emoticons to express their feelings, when they have problems expressing it face-to-face and feel more confident talking to each other online, and when they are afraid to say the wrong thing and texting give them more time to think about what to say.

Some of the parents who participated in the FGD sessions agreed that the smartphones facilitate their communication, especially via mobile messaging/texting. They found phone communication is much better than face-to-face communication as it is convenient to communicate with children and their teachers anytime. Moreover, some participants pointed out that texting does not require spontaneous wit; they have some time to think and carefully craft clever messages.

Further, the findings showed that a majority (88% in total) of the students spent time in person with their family (i.e. had face-to-face communication), followed by talked to their family on smartphone (86.3% in total), sent instant messages or text on mobile messaging apps to their family (82% in total), and talked (voice calls) to their family on mobile messaging apps (80% in total). The findings also indicate that email is falling into disfavour, with less than half of the students using email to communicate with their family, as it does not allow immediate contact on smartphones, or when away from computers. Overall, looking at the research findings, the findings of current research are that face-to-face encounters are more common than online encounters within a family.

Nearly 5 in 10 teens spent at least 3 hours daily with their family in person, while less than 4 of 10 teens used landline and other mobile communication technologies for at least 3 hours daily. Only 12 percent of the teens in the research reported that they never spent time with family in person.

Hence, it can be concluded that the use of mobile communication technologies does not spoil face-to-face communication of young Malaysians with their family. The research also showed that there were significant differences found in face-to-face communication with family in terms of age, gender, and household income. However, the research findings indicated that there was no significant difference for face-to-face communication with family in terms of geographical locations and household income.

With regards to their relationship with friends, this study revealed all of these technology-based communication methods have gradually replaced face-to-face communication for many teenagers in their communication and interaction with friends. Only 15 percent of the teens in this survey reported that they never talk to friends (voice calls) on mobile messaging apps. Less than 12 percent of teens never talk to friends on smartphones (11.4%), and never send instant messages or text on mobile messaging apps to each other (11.2%).

The study showed that the use of smart (or mobile) phones has changed human interaction in that mobile communication has gradually replaced face-to-face communication for teenagers in their communication with friends but not replaced face-to-face communication with their family. This study also showed that face-to-face communication among children and teenagers is being replaced by mobile messaging apps such as WhatsApp, WeChat, and Facebook Messenger. Text and voice messaging were the main tools of communication as well as talking on mobile messaging apps (voice and video calls).

The findings yield similar findings to Blackman (2010), who noted that the utilisation of text messaging has increased dramatically over the past decade. Teens especially have been found to display a special affinity for text messaging as their preferred type of mediated interaction. Adolescent texting behaviour has been found to peak in the late teen to young adult age group (19 to 21 years old). Pierce (2009 as cited in Nakamura, 2015) established a positive correlation between the absence of social anxiety among teenagers (feeling comfortable when talking with others) and their ability to make friends online.

The findings in the present study on the effects of the smart (or mobile) phone use on face-to-face and mobile communications were partially supported by past studies (e.g. Bian, 2012; Bian & Leung, 2014; Chen et al., 2014; Chen, 2007; Elsobeihi & Abu-Naser, 2017). In Bian &

Leung, 2014; Chen, 2007 and Elsobeihi & Abu-Naser, 2017, there were strong positive relationships between mobile phone use and communication motives with friends as well as family. Findings in the present study found that the increased use of mobile communication technologies had diminished the face-to-face communication of young Malaysians with their friends, but not the family. Findings in this research differs to the work of past studies on the mobile communication with family (Bian & Leung, 2014; Chen, 2007; Elsobeihi & Abu-Naser, 2017). This may be due to this research examining younger teens living at home, whereas the past studies investigated late teens (e.g. college students) who had moved out of parental homes and were adjusting to new living environments. They were not under the direct control of parents while living away from home. College students are typically away from home, and are likely to use the technology differently than teenagers living at home.

As younger teens need parental protection and guidance, younger children only used the mobile phone as a way to coordinate family events and keep parents informed of the children's whereabouts (Devitt & Roker, 2009; Palen & Hughes, 2007 as cited in Alderson, 2012). However, drawing on the work of Green and Ling, Chen (2007) noted that children sometimes avoided parents' monitoring by not answering their mobile phones (making excuses by claiming that they did not hear the mobile phone ring or that the battery was dead) or by not telling the truth to their parents. Smale (2011)

argued that mobile phones present the potential to connect the family when they are separated, but mobile phones also present the potential to separate the family when they are together.

v.   Smartphone addiction and its association with social anxiety and engagement

To investigate if the Malaysian youth are addicted to smartphone, a term known as 'nomophobia' for digital addiction, the survey examines the level of smartphone addiction (SAS) among young Malaysians, ranging from 'Not at all' to 'Severe' status. The SAS uses a 5-point Likert scale with 10 items, ranging from 'Strongly Agree' (5) to 'Strongly Disagree' (1) to measure the level of smartphone addiction among students. The answer 'Strongly Agree' indicates high level of smartphone addiction, whereas 'Strongly Disagree' indicates low level of smartphone addiction that smartphone users feel.

Table 6 reveals that 796 students (39%) experience a mild smartphone addiction, 696 of them (35.8%) have a moderate level of smartphone addiction, and 380 students (19.5%) are not addicted to smartphone at all. Only 110 students (5.7%) have severe smartphone addiction.

Table 6: Frequency and percentage of students' total scores of smartphone addiction

Total scores of SAS	Level of Smartphone Addiction	Frequency	Percentage
≥ 40	Severe	110	5.7
30 – 39	Moderate	696	35.8
20 – 29	Mild	759	39.0
< 20	Not at all	380	19.5

The study also looked into the social interaction anxiety level to see if social anxiety and social engagement among youth are impacted by communication technologies. In other words, is there a connection between nomophobia and social engagement? The study first looked into the level of anxiety among youth and measured its relationship using the Pearson's Correlation Coefficient.

The descriptive data as shown in Table 7 reveals that 746 students (38.4%) experience a low level of social anxiety, 610 of them (31.4%) have a moderate level of social anxiety, and 452 students (23.2%) have a very low level of social anxiety. Only 137 students (7%) have high social anxiety.

Table 7: Level of social interaction anxiety scale (SIAS) of Malaysian Youth

Total scores of SIAS	Level of Social Anxiety	Frequency	Percentage
≥36	High	137	7.0
24 – 35	Moderate	610	31.4
12 – 23	Low	746	38.4
<12	Very Low	452	23.2

The study showed a significant positive relationship between nomophobia with social interaction anxieties. There was a positive correlation between smartphone addiction (SAS) and social anxiety (SIAS) with a moderate correlation (r=0.477) (Colman & Pulford, 2008; Phanny, 2014). The findings revealed that students with addiction to mobile technologies have higher level of social anxiety.

The study also revealed the level of social engagement among youth and its relationship with technologies addiction. The descriptive data shown in Table 7 reveals that 740 students (38%) have a moderate level of social engagement, 652 of them (33.5%) experience a high level of social engagement, and 427 students (22%) have a low level of social engagement. Only 126 students (6.5%) have difficulties to engage themselves in social context (a very low level of social engagement).

Table 8: Level of social engagement of Malaysian Youth

Total scores of SES	Level of Social Anxiety	Frequency	Percentage
≥20	High	652	33.5
15 – 19	Moderate	740	38.0
10 – 14	Low	427	22.0
<10	Very Low	126	6.5

Pearson's Correlation Coefficient (r) with significant p-value indicate a negative relationship with social engagement (r=-0.434, p<0.001). This indicates a negative correlation between smartphone addiction and social engagement. In summary, the study reveals that there is a significant and positive correlation between smartphone addiction and social anxiety, as well as social engagement, which is consistent with previous studies (Brown, 2013; Darcin, et al., 2015; 2016; Gao, et al., 2016; Konan, et al., 2018; Kraut et al. 2011; Lee et al., 2014; Seo, Kim & David, 2015).

Thus, the present research and existing literature that yield similar findings have demonstrated clearly that the smartphone addiction is a substantial driver of the social interaction anxiety, which is associated with higher levels of depression and feelings of loneliness, along with decreased social involvement.

CONCLUSION

This research is timely, following the much alleged problems found in the use of smartphone and internet, as well as its impact on human interaction, exclusively familial and social relationship. This study revealed the concern of stakeholders namely the parents, students and social communities. Behavioural patterns are emerging from the influence of communication technologies but has not affected the social ties with family and society members. Level of addiction is a concern but have not affected family and society engagements though dynamics of interaction have slowly emerged. This study recommended that interaction dynamics be left for other future research as the topic is relevant and affect the behaviour of youth in Malaysia.

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The Impact of Social Networking on Malaysian Secondary School Students:

Attitudes, Behaviours and Risks

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ABSTRACT

This study explored the effects arising from the use of social media applications by Malaysian secondary school students for social networking (SN) purposes. The main aims of this study are to investigate Malaysian teenagers' attitudes and behaviours towards SN and the degree they are concerned with the risks and dangers involved and how they manage these risks. A mixed method comprising quantitative and qualitative instruments was used. The quantitative instrument was in the form of a questionnaire and the qualitative component was in the form of focus group interviews. The study was undertaken on Form Two and Form Four male and female students from four selected schools in the Klang Valley and Selangor.

Altogether a total of 1,109 students took part in the quantitative survey which was analysed with the use of descriptive and inferential statistics tools. The qualitative data were analysed thematically. The quantitative findings indicated that about 30 percent of the students of different age groups, genders and school types use SN sites for more than five hours per day for social or entertainment as well as for learning purposes. There was also a general awareness among the students across school types and age groups on the risks associated with using SN sites. However, it was found that the students lack awareness regarding privacy issues and are not aware that it is not possible to remain anonymous online.

INTRODUCTION

There is a plethora of Social Networking (SN) systems that allow individuals to meet and chat online these days. Boyd and Ellison (2007) defined an SN system as a web-based service that allows individuals to do the following: (i) build public or semi-public profile in a system, (ii) share a connection, and (iii) view and cross-list their relationship with others in the system. Such systems enable easy and rapid connection with friends, families, classmates, customers and clients.

It is widely acknowledged that SN plays a major role in life of today's teenagers. It can be a pervasive technology which can result in risky behaviours. Examples of risks arising from SN use include disclosure of embarrassing personal information, blackmailing through the use of photos found online, social scams and users' backlash against newly introduced features, cyberbullying, privacy issues and sexting. Children and adolescents are particularly vulnerable to such risks as they are less aware of the necessity for self-regulation (O'Keeffe & Clarke-Pearson, 2011; Bonneau & Preibusch, 2010). These issues have caused concerns and led to increased efforts to comprehend the attitudes and behaviours of children and teenagers toward SN.

This study was a direct result of the desire to investigate Malaysian teenagers' attitudes and behaviours towards SN and the degree they are concerned with the risks involved and the mitigation efforts. These issues have been studied in a variety of internet contexts and applications abroad (Berkman & Shumway, 2003; Iachello & Hong, 2007). However, most of the major studies on the risks and dangers of SN in Malaysia have been undertaken on university students (Norshidah Mohamed & Ili Hawa Ahmad, 2012; Norsaremah Salleh, Ramlah Hussein & Norshidah Mohamed (2012)).

The research sought to study the patterns of SN usage among the secondary school students across different age groups, genders and school types. Another objective was to determine the extent to which school students were aware of the risks, abuse and dangers related to SN. This study also identified the role and impact of SN in their lives. Finally, this study investigated how they mitigate the risks and dangers.

LITERATURE REVIEW

Conceptual Framework

This study was drawn on two media theories: the "uses and gratifications" theory (Rosengren, Palmgreen, & Wenner, 1985) and the theory of "ritualised media use" (Debatin, Lovejoy, Scripps, Horn, & Hughes, 2009). These theories were utilised as the analytical background and framework to better understand the findings of the study. The needs under the gratification's theory explored in this study are: (1) the need for diversion (2) the need for entertainment, (3) the need for (para-social) relationships, and (4) the need for identity construction.

This study explored how SN was used by the students to accomplish the abovementioned needs. The study was also interested to find out whether gratifications from using SN sites lead to diminishing concern over privacy and personal matters among Malaysian secondary school students.

The second theory of ritualised media use explains that the media serves not only informational and entertainment purposes but are used every day as a routine in life as well as for diversion and pastimes. It can be such an important ritual that other aspects of the students' lives are neglected.

Risks of SN

There are numerous risks linked with SN. The following risks were investigated in this study.

Cyberbullying

There is an on-going debate in regard to the definition of cyberbullying, as many differ in the way they interpret the term (Smith, Mahdavi, Carvalho, & Tippet 2006; Coffman, 2011; Betts, 2016). Some may refer to it as an 'umbrella phrase' that encompasses types of bullying such as electronic bullying, online bullying or internet harassment (Betts, 2016) while others focus on cyberbullying behaviours and how it occurs through the various social media (Coffman, 2011). In this study, cyberbullying is defined as using an electronic version of contact to carry out deliberate hostile action against victims who do not have the means to protect themselves (Smith et al. 2006). This includes sending threatening, harassing or humiliating messages to them.

Sexting

Sexting has been defined as 'exchanges of sexual messages or images' as well as 'the creating, sharing and forwarding of sexually suggestive nude or nearly nude images' through mobile phones and/or the internet (Lenhart, 2007; Lohmann, 2012). Sexting can have psychological consequences. There are many media reports of cases of young people being harassed or bullied because they sent someone a sexy picture of themselves, which was then sent to other people without their permission. This type of bullying and harassment can lead to depression and, in some cases, suicide (Lee, Crofts, & Milivojevic: 2015).

Online sexual solicitation and predation

Sexual solicitations can be defined as "request to engage in sexual activities or sexual talk or provide personal sexual information that are unwanted or when made by an adult to a young person with or without their consent (Davidson & Gottschalk, 2010; Mitchell et al, 2014).

Exposure to indecent content

The rise of digital technology has made the young generation more exposed to problematic internet-based content such as violent media (movies, music, and image) and pornographic content that is legal for adults to consume.

The Malaysian Scene

As mentioned earlier, studies that explore risks on the use of SN among Malaysian teenagers are limited in number. An example of a study in relation to online risks is a recent quantitative study on the prevalence of cyberbullying among Malaysian children, undertaken by Sarina Yusuf, Md. Salleh Hj. Hassan & Adam Kolo Mohammed Mohammed Ibrahim (2018). A survey was conducted on 378 students between the ages 9 to 16 from eight schools in Selangor.

The results of the study showed that only 3.9 percent of the respondents had been threatened online. 20.8 percent had seen inappropriate materials posted online at least once and only 14.5 percent of the respondents had seen people committing obscene acts online. The study further revealed that only 11.1 percent of the respondents had suffered the humiliation of being expelled from an online group and 4.2 percent of them had been asked by someone to share pictures or videos of their private parts online. The overall results of the study suggested that majority of respondents had experienced mild forms of cyberbullying at least once within the past year; indicating that serious incidents of cyberbullying were rare and far between.

METHODOLOGY

This study employed three types of research methods: quantitative and qualitative instruments and a focus group interview.

Research Instrument

The quantitative instrument had three sections:

1) Section A elicited demographic information of the students;
2) Section B obtained information from the students on the use of SN for learning purposes; and
3) Section C sought information regarding students' SN patterns and behaviours, which include investigating their behaviours towards SN, awareness of risks as well as awareness of abuse of the SN systems.

The qualitative instrument used for the focus group interview comprised three components:

1) A form that sought basic background information of each interviewee as well as information regarding their use of SN sites such as frequency and duration of use and SN habits;
2) Open-ended questions to obtain students' experiences in using Social Network (SN) sites; and
3) Seven scenarios depicting situations involving the negative consequences of using SN apps.

Sampling

The students' samples for this project were derived from four types of secondary schools in Klang Valley areas and Selangor in Malaysia. It comprised of an urban school, a suburban school, a rural school and lastly an elite school.

a.   The urban school

This is an urban school about 17 km from Kuala Lumpur. It is a secondary co-education school where the language of instruction is Mandarin. The medium of instruction for all subjects except English and Bahasa Malaysia is in Mandarin. All students come from National Type Chinese School (with Mandarin as the medium of instruction).

b.   The suburban school

This suburban school is about 30 km from Kuala Lumpur. The students are Malay male and female students who all came from national primary schools. The medium of instruction for all subjects except English is in Malay. Students in this school generally speak Malay at home and they come from middle income families. Most of their parents are civil servants and they live around Putrajaya.

c.   The rural school

This is a rural co-education school about 30 km from Kuala Lumpur. This is the normal type of Malaysian school where students are drawn from the surrounding areas. The medium of instruction for all subjects except English is in Malay. However, the students in this school come from mixed primary school background (National Type Chinese school, National Type Tamil schools and National school).

d.   Elite school

This is an elite, residential school for Malay girls in the Klang Valley. All students in this school were selected for admission because they obtained excellent results in the Ujian Pencapaian Sekolah Rendah (UPSR - Primary School Achievement Test). The medium of instruction of all subjects in this school is in Malay except for the English Language subject. They generally speak English at home and come from upper middle-class families with parents who are either professional or businesspeople.

Data Collection

a. Distribution of questionnaires

The convenience sampling approach was used. The questionnaire was distributed to all available Form Two and Form Four students from the selected four schools as permission could not be obtained from the Ministry of Education at Putrajaya to conduct the research on examination classes (i.e. Form Three and Form Five students).

b. Administering focus group interviews

The focus group interviews were conducted by researchers of the project. Each group of students were required to provide personal background information and SN habits on a form and then participate in an open discussion on the benefits and problems in using such sites. Finally, they were showed 7 scenarios, one at a time and asked to give their opinion of each scenario. The researcher had a list of prompt questions that she would use when necessary.

c. Descriptions of scenarios

Scenario 1: showing a girl posting a sexy selfie of herself on Facebook.

Scenario 2: showing a girl receiving a pop-up message asking for her password while talking to a friend online.

Scenario 3: showing a boy expressing delight because he is able to illegally enter the account of a person who has been a jerk to him to take revenge.

Scenario 4: showing a girl in a state of excitement because a boy she has been corresponding with online has asked her to go on a date.

Scenario 5: showing a girl being very upset because someone has posted pictures of her in a costume she wore at a friend's birthday party and making fun of her by calling her stupid, silly, ugly etc.

Scenario 6: showing a rabbit (representing an innocent student) finding pornography materials and violent images in his/her computer.

Scenario 7: showing a boy who is very upset because materials suggesting he is a homosexual have been circulating in SN sites. In actuality, he is not a homosexual.

Data Analysis

The quantitative data from the questionnaire were analysed using mean scores comparisons, descriptively and inferentially using T-tests and ANOVA. The qualitative data from the semi-structured group interviews were analysed according to themes.

FINDINGS

Findings - Quantitative component

i. Baseline Data

The overall breakdown of students according to age groups, genders and types of schools are given in Table 1. As can be seen from Table 1, there is a good representation of subjects for each category.

Table 1: Breakdown of students from all four schools

School	Students age 14						Students age 16						Overall	
	F	%	M	%	Total	%	F	%	M	%	Total	%	Total	%
Urban	42	11.90	48	24.74	90	16.45	53	14.56	60	30.3	113	20.11	203	18.30
Suburban	67	18.98	82	42.37	149	27.24	69	18.95	80	40.4	149	26.51	298	26.87
Rural	84	23.79	64	32.98	148	27.06	92	25.27	58	29.3	150	26.69	298	26.87
Elite	160	45.33	-	-	160	29.25	150	41.22	--	--	150	26.69	310	27.96
Total	353	100	194	100	547	100	364	100	198	100	562	100	1109	100

For quantitative analysis according to genders and age groups, only data from Form Two and Form Four students from three schools i.e. the urban, suburban and rural schools were used. These are considered as "normal schools" with a good mix of boys and girls.

The elite group was not included for these comparisons as the students in this school are all specially selected girls of high proficiency. They do not represent atypical students from the normal population. The data would be skewed if they were included. However, in the comparison across all four schools, the elite students were included. The tables below present the findings derived from descriptive and inferential analysis of the questionnaires.

ii. Summary of Findings

Tables 2 and 3 summarise the findings of the quantitative section.

Table 2: Summary of the findings across age groups and genders

	Male age 14 students	Female age 14 students	Male age 16 students	Female age 16 students
1. Pattern of usage of SN sites above 5 hours	37%	38.2%	32.3% (less usage than age 14)	34.1% (less usage than age 14)
2. Most popular SN sites (ranked)	Facebook WhatsApp WeChat Instagram	Facebook WhatApps Instagram WeChat	Facebook WhatsApp WeChat Instagram	WhatApps Facebook Instagram Twitter
3. Using SN sites for learning purposes	For 6 out of 14 learning items	For 9 out 14 learning items	For 9 out of 14 learning items	For 10 out of 14 learning items

Table 2: Summary of the findings across age groups and genders

	Male age 14 students	Female age 14 students	Male age 16 students	Female age 16 students
4. Befriending and meeting strangers	Have tendency to indulge in risky behaviour.	Less tendency to indulge in risky behaviour compared to males aged 14.	Have tendency to indulge in risky behaviour.	Significantly less tendency to indulge in risky behaviour compared to males aged 16.
5. Privacy issues (revealing password)	Less concerned about privacy issues.	Concerned about privacy issues Slightly less risky.	Less concerned about privacy issues More risky difference.	Less concerned about privacy issues Slightly less risky.
6. Privacy issues (things posted cannot be deleted and not safe to store information online)	Aware of danger.	Aware of danger.	Aware of danger.	Aware of danger.
7. Remaining anonymous online	Not aware that this is not possible.	Lack of awareness is significantly higher than boys.	Not aware that this is not possible.	Lack of awareness is significantly higher than boys.
8. Posting of selfies	Do not view it as risky but significantly less in favour of it.	Do not view it as risky.	Do not view it as risky but significantly less in favour of it.	Do not view it as risky.
9. Harassment & cyberbullying	Aware these are wrong and willing to act if someone is harassed but less likely to act if they themselves are harassed.	More aware of danger of harassment and cyberbullying. Likelihood to act is higher than boys.	Aware these are wrong and willing to act if someone is harassed but less likely to act if they themselves are harassed.	More aware of danger of harassment and cyberbullying. Likelihood to act is higher than boys.
10. Sexting (engage in online sexual activities or sexual talk)	Less aware of danger and more exposed to this.	Significantly more aware of danger and less expose to this.	Less aware of danger and more exposed to this.	Significantly more aware of danger and less exposed to this.
11. Exposure to indecent materials	Less aware of danger.	Significantly more aware of danger.	Less aware of danger.	Significantly more aware of danger.

Table 3: Summary of the findings for students age 14 & 16 across school types

School	Age 14 & 16 students			
	Urban	Suburban	Rural	Elite
1. Pattern of usage of SN sites above 5 hours	Age 14 - 42.7% Age 16 - 30.4% Age 14 > age 16 students	Age 14 - 44.2% Age 16 - 34.2% Age 14 > age 16 students	Age 14 - 30.4% Age 16 - 33.3% Age 14 < age 16 students	Age 14 - 35.8% Age 16 - 35.3% Age 14 > age 16 students

Table 3: Summary of the findings for students age 14 & 16 across school types

School	Age 14 & 16 students			
	Urban	**Suburban**	**Rural**	**Elite**
2. Most popular SN sites Facebook *(F)* *WhatsApps (W)* *WeChat (We)* *Instagram (I)* *Twitter (T)*	Age 14 - F, W, We, I Age 16 – F, W, We, I	Age 14 - W, I, F, We Age 16 - W, I, We, F	Age 14 - F, We, W, I Age 16 - W, F. We, I	Age 14 - F, I, W, Twitter Age 16 - F, T, W, I
3. Using SN sites for learning purposes	Age 14 - For 3 out of 14 learning items. Age 16 - For 6 out of 14 learning items.	Age 14 - For 9 out of 14 learning items. Age 16 - For 11 out of 14 learning items.	Age 14 - For 8 out of 14 learning items. Age 16 - For 10 out of 14 learning items.	Age 14 - For 13 out of 14 learning items. Age 16 - For 12 out of 14 learning items.
4. Befriending and meeting strangers	Age 14 - aware of risks. Age 16 - aware of risks.	Age 14 - aware of risks. Age 16 - aware of risk.	Age 14 - aware of risks. Age 16 - Significantly less aware of risks.	Age 14 - Significantly more aware of risks. Age 16 - Aware of risks.
5. Privacy issues *(like revealing password)*	Age 14 - More awareness. Age 16 - Lack of awareness.	Age 14 - Lack of awareness. Age 16 - Lack of awareness.	Age 14 - Lack of awareness. Age 16 - Lack of awareness.	Age 14 - Lack of awareness. Age 16 - Lack of awareness.
6. Privacy issues *(things posted cannot be deleted & not safe to store information online)*	Age 14 - Aware of danger. Age 16 - Aware of danger.	Age 14 - Aware of danger. Age 16 - Aware of danger.	Age 14 - Aware of danger. Age 16 - Aware of danger.	Age 14 - Aware of danger. Age 16 - Significantly lower awareness than other groups.
7. Remaining anonymous online not possible	Age 14 - lack of awareness. Age 16 - Lack of awareness.	Age 14 - lack of awareness. Age 16 - Lack of awareness.	Age 14 - lack of awareness (1.63) Age 16 - Lack of awareness (1.92)	Age 14 - Lack of awareness. Age 16 - Significantly the least aware.
8. Posting of selfies	Age 14 - More aware of risk & indulge less. Age 16 - More aware of risk.	Age 14 - Significantly less aware of risks. Age 16 - More aware of risk.	Age 14 - Aware of risks. Age 16 - Significantly less aware of risk.	Age 14 - Aware of risk. Age 16 - Less aware of risk.
9. Harassment & cyberbullying	Age 14 - Aware they are wrong and indicate willingness to act if they witness them. Age 16 - Aware they are wrong and indicate willingness to act if they witness them.	Age 14 - Aware they are wrong and indicate willingness to act if they are witness them. Significantly more willing to act.	Age 14 - Aware they are wrong and indicate willingness to act if they are witness them. Age 16 - Aware they are wrong and indicate willingness to act if they witness them.	Age 14 - Significantly more aware than other school-types. Age 16 - Aware they are wrong and indicate willingness to act if they witness them.
10. Sexting *(engage in online sexual activities or sexual talk)*	Age 14 - Aware of danger. Age 16 - Aware of such dangers.	Age 14 - Aware of danger. Age 16 - Aware of such dangers.	Age 14 - Aware of danger. Age 16 - Aware of such dangers.	Age 14 - Aware of danger. Age 16 - Significantly most aware.
11. Exposure to indecent materials	Age 14 - Aware of danger. Age 16 - Aware of such dangers.	Age 14 - Aware of danger. Age 16 - Aware of such dangers.	Age 14 - Aware of danger. Age 16 - Aware of such dangers.	Age 14 - Aware of danger. Age 16 - Significantly most aware of such dangers.

Findings - Qualitative component

i.   Sample population

To offer some insights into the qualitative data, the analysis was undertaken on four groups of Form 4 female students from the four different types of schools and three groups of Form 4 male students from the three different types of schools. The male students were drawn from only three of these schools as the elite school has only female students. Table 4 provides a summary of findings of the qualitative component of the female students and the male students.

Table 4: Summary of the findings of the qualitative component of the female and male student

Sce-nario	The urban school	The suburban school	The rural school	The elite school (has no male students)
1	F: Believed nothing wrong in loading selfies. Not worried about self-exposure. M: Felt that posting selfies was a waste of time and Lily's behaviour not healthy.	F: Two viewed it positively and two pointed out the negative effects. M: All agreed that Lily was exposing herself to harm and might get hurtful comments.	F: Believed nothing wrong in loading selfies. Not worried about self-exposure unless uploading very sexy photos. M: Three boys felt posting selfies was not wrong in moderation and not for vanity.	F: Aware of the danger of online predation so they did not upload selfies of themselves in the SN sites.
2	F: All aware of the danger of exposing passwords online and would click exit. M: All aware it might be a scam and felt strongly that the girl should not give her password to the unidentified account.	F: All aware of the danger of exposing passwords online and would ignore the message. M: Three were aware of the dangers of hacking & would not enter password. One seemed oblivious.	F: All aware of the danger of exposing passwords online and ignore message. M: Three were aware that this might lead to them being hacked. One seemed unaware of this.	F: Protected their own privacy by not responding to messages asking them for their IDs and passwords.
3	F: All did not condone the boy's action of hacking into someone's account. M: Three students knew the boy was hacking and said they would advise him to stop. But one student felt that he was merely playing a computer game.	F: All aware that the boy's action was wrong and even suggested he asked for forgiveness from the person he hacked. M: Three agreed that hacking was wrong & suggest advising the boy to stop doing that.	F: All aware the action was an invasion of privacy. They gave some real life examples of serious hacking that involved cheating and criminal acts. M: Three were against the act. One said it was okay if for revenge.	F: All aware of the unethical use of SN sites and condemned the boy for hacking into someone's account.

Table 4: **Summary of the findings of the qualitative component of the female and male student**

Sce-nario	The urban school	The suburban school	The rural school	The elite school (has no male students)
4	F: All said they would not meet up with the boy and doubted the photo was genuine. Two said they were not interested but believed he was out to cheat money. M: All agreed it was not safe and would not do it and would not allow their sisters to do so too.	F: Two said they would find out whether the photo was genuine. Two said they were not interested but were willing to meet him if accompanied. M: Said not so dangerous for them but dangerous for their sisters.	F: Three said they would meet the boy but said they would choose a public place or/and go with friends. M: They didn't think it would be dangerous for them but would be so for girls and would accompany their sisters to do so.	F: All said they would not meet up with people they met online.
5	F: All aware that the girl was upset but felt she took it too seriously and should move on. M: All realised the girl was upset but felt it was not a big deal and should take that as a lesson to improve her dressing style.	F: All sympathised with the girl and feared it might lead to truancy or suicide. They advised her to consult a psychologist/report to MCMC. M: All sympathised and felt the act was wrong However, they felt she should not take it too seriously and move on.	F: All reacted strongly and felt she should demand an explanation from the perpetrator. However, they felt it was unnecessary to be so upset. M: Generally sympathised. Three felt she should not take it too seriously whereas one felt she should take revenge.	F: They empathised vehemently with the girl as they had similar nasty experiences
6	F: All had experienced such images popping up and immediately closed them. They worried about such materials polluting children' minds. M: Three said they had seen such materials and were curious initially but did not indulge. One did not bother to view.	F: All had seen such images and quickly closed them. They believed that watching such materials could lead to addiction and attempts to follow the actions. M: All had seen such materials online and viewed out of curiosity but they were not disturbed by them.	F: All had seen such images and quickly closed them. They felt the images were bad influence on children but not on themselves. M: Only one boy was against watching such materials whereas the rest felt it was a process of growing up.	F: They avoided pornographic websites and websites showing violence and one even installed ad-block to protect herself.
7	F: All sympathised with Ahmad and offered sensible advice like declaring his sexuality and reporting the bullies to the police. M: All felt the perpetrators behaved badly and advised Ahmad to ignore them. One student even admitted to being in this position before.	F: They felt sorry for Ahmad and would try to help but some of their advice seemed impractical. M: All sympathised with Ahmad but had no experience so did not offer any helpful suggestion	F: They felt the best thing to do was to confront the perpetrator but felt it was not a big issue compared to worse incidents like being chased by an "Ah Long". M: All sympathised with Ahmad. Three felt he should not take it too seriously and one felt he should revenge.	F: They were very angry with Ahmad being bullied online. However, their suggestions on how to help him seemed to be unrealistic.

Note: Female = F; Male = M.

DISCUSSION

The discussion was undertaken in accordance to the research questions. Findings from the quantitative data was used to answer research questions 1 and 2, whereas findings from the qualitative data was used to answer research questions 3, 4 and 5. The conceptual framework of the study was also be taken into consideration in this discussion.

Research Question 1: What are the patterns of use of SN among Malaysian Secondary School students of different age groups, genders and school types?
The quantitative findings indicated that overall only about 30 percent students of different age groups, genders and school types use the SN sites for more than five hours. This figure can be considered high if they use the sites for only social or entertaining purposes but it is found that majority of the students use the sites for learning purposes too. The pattern seemed to suggest that female students used the sites for learning purposes more than male students. The elite students used them most for studying purposes while the urban students seem to use the sites least for learning purposes.

Research Question 2: To what extent are they aware of the risks, abuse and dangers related to SN?
Generally, students across all school types are aware of the risks associated with SN, with girls being more aware of risks of meeting and befriending and meeting strangers. This general awareness is encouraging as it indicates that there is no rural-urban divide about awareness of such risks.

Likewise, there was no clear rural-urban divide regarding awareness of privacy issues. Students of different age groups, genders and school types all lacked awareness regarding privacy issues such as danger of revealing password to strangers. They were also not aware that it is not possible to stay anonymous online.

Regarding the risk of posting selfies, it was generally viewed positively (not wrong to do) regardless of students' age groups, genders and school types. An interesting pattern wasthat girls in general view it more positively than boys. Thus, it appeared that there was a pattern of gender-divide but not urban-rural divide in this case.

As for harassment and cyberbullying, male and female students are aware that these activities are wrong, and they indicate willingness to act if they witness such incidents. However, they appear reluctant to act if they themselves are harassed and this likelihood is significantly higher in boys. Most of these cases often go unnoticed because these students might be afraid, embarrassed or unsure if they were being bullied. The encouraging thing is that girls seem to be more aware of the danger of harassment and cyberbullying than boys.

Regarding school types, there is also a general awareness among students aged 14 that harassment and cyberbullying are wrong, and the students seem willing to act. This phenomenon is more pronounced among elite students and least pronounced among suburban students. Likewise for students aged 16 except that in this case both suburban and elite students are more willing to act than the other groups.

This pattern was repeated in the case of dangers arising from sexting and exposure to indecent materials. Boys were generally less aware of dangers associated to these activities than girls. On top of that, the elite girls were most aware of such dangers especially the students in the age 16 group.

Research Question 3: How important is SN to these students?

The qualitative findings revealed that male and female students from the various schools found SN beneficial and useful for entertainment, to keep in touch with friends online and also for learning purposes; for example, discussing homework with classmates and looking up materials for assignments.

The findings further reveal that the female students from all four schools in this study use SN sites frequently and the degree of usage varies from school to school. The students in the elite school are the most avid users of SN sites. Generally, all of them are aware of the danger of SN and they know how to prevent

themselves from being hacked and also know how to handle cases of cyberbullying and not expose themselves to pornographic materials.

A point to note was that the students in the urban, suburban and rural schools seemed less stressed and less emotional regarding their SN experiences than the elite students. A possible explanation to this is that the urban, suburban and rural students live at home; hence they were more exposed to the realities of daily life and happenings in society unlike students in the elite school who were living in the protected environment of a residential college. However, more in-depth research needs to be undertaken to find out to what extent this postulation is true. On the other hand, the male students from the three schools also often use SN sites but generally less than that of the female students.

In general, the male students were also aware of the danger of SN and they know how to prevent themselves from being hacked and also know how to handle cases of cyberbullying but they were more tolerant towards pornographic materials, especially the rural students. On the whole they have a more relaxed attitude in handling the problems related to SN and did not believe in being too upset or worked up over harassment and cyberbullying.

Referring to the gratifications theory, it can be concluded that on the whole the students do see the advantages of SN for diversion and entertainment and for establishing relationship and friendship but there is no evidence of the use of SN for identity construction. In addition to that there is no evidence of gratifications from using SN sites leading to diminishing concerns over privacy and personal matters among the female students; even among the active students from the elite school. There is also no evidence of urban-rural divide affecting perceptions of importance of SN but rather differences due to male-female divide. However, there is some evidence of self-gratification leading to diminishing concern over privacy and personal matters in the case of the boys. This will be discussed in Research Question 5.

Research Question 4: How different is the role of SN in the social lives of these students?

Female students in the urban school were as active users of SN sites as students in the elite school. However, female students in the urban school were less passionate about SN than students in the elite schools. Female students in the suburban and rural school do undertake SN activities actively but to them SN is less of a ritual as they were more involved in outside social activities. Hence it can be deduced that urban students were more active users of SN sites compared to rural students and SN was more of a ritual to the former than the latter.

In the case of the male students, the findings revealed that the boys were less active in SN than girls and it was less of a ritual to them and that was a pattern found across the three schools. However, on the whole for all male and female students, there was no evidence in the findings that indicate SN was causing them to neglect their studies and other aspects of their lives.

Research Question 5: How do they handle the risks and dangers involved in SN?

The findings showed that the male and female students in this study were aware of viruses and identity theft and other security issues on SN systems and will stay clear of risky behaviours when they use SN. Another positive point to note was that the female students were against posting sexy photos. The male students from all three schools were willing to tolerate posting of selfies but saw it more of a "girl thing". They think it was fine if performed in moderation but view excessive posting especially those involving sexy photos as dangerous.

The female students from the elite school took the consequences of texting and cyberbullying most seriously compared to the female students in the other schools. The female students in the suburban school and the rural school appeared willing to meet strangers they meet online. This was particularly evident among students in the rural school who think it is part of the norm of society and will participate after taking some precautionary measures. Out of the four schools, the rural school students can be described as the group that was least worried of the risks of SN. It was postulated here that

this may be due to the fact that they were the least active users of SN sites. In addition to that, they lead a less sheltered life compared to students in the other three schools. They had more practical experiences or knowledge regarding negative effects of the society; therefore, they were more streetwise and saw things in a less personal way compared to students from the other schools.

The boys from all three schools are aware of risks and dangers of SN in general but are less concerned and worried. There is some evidence of self-gratification leading to diminishing concern over privacy and personal matters in the case of the boys. They do not think it is wrong to watch pornographic materials in moderation. They are against their female friends and sisters meeting strangers they meet online but have fewer qualms of doing it themselves. The fact that they do not see it as being dangerous for themselves show a lack of awareness that paedophiles can target boys as well. Their attitude towards handling of risks and consequences of such risks is more relaxed and most of them believe that they should not take harassment and cyberbullying too seriously. Generally, they seem to adopt the attitude that the victims should be brave and learn to move on.

CONCLUSION

This study aimed to provide deeper insights in the school students' patterns of usage, behaviours and knowledge in dealing with risks associated with SN applications. SN plays an important role in the lives of these young people as evidenced in this study with around 30 percent of the students online for more than five hours per day. It is good to know that not all of those hours were spent for entertainment or social pleasures as the students also indicated frequent use of SN for learning purposes. Although the students have general awareness of online safety practices, the results also showed lack of knowledge and awareness in specific issues such as privacy and being anonymous online. It is envisioned that the findings of this study will enlighten relevant stakeholders including parents, teachers, care takers, NGOs as well as government bodies in dealing with online safety issues among teenagers. The additional knowledge, it is hoped, will aid in developing better monitoring and protective measures to safeguard and protect them from the risks and dangers posed by SN.

RECOMMENDATION

The recommendations of the study are as follows:

- Targeted online safety campaigns or initiatives – by understanding the issues or concerns of online safety among teenagers across gender, age groups and school types, the initiatives or campaigns launched by the government agencies or NGOs could address specific groups and issues relevant to them for a more effective and impactful campaign.

- Online safety education and awareness for parents, caretakers or teachers – to consider incorporating online resources or guidelines for this group in the current or future initiatives to equip them with the necessary skills and knowledge in dealing with online safety issues. This could be coupled with engagement, training or workshop sessions with the experts or media advocators.

- User empowerment and self-regulatory mechanisms – balancing empowerment and protection is crucial since young people in both rural and urban will confront increased use of SN media in the coming years. In this regard, self-regulatory mechanisms need to be developed and supported.

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NMRCP
Networked Media Research Collaboration Programme

An Intervention Programme for Excessive Internet Users:

A Practical Manual for Adolescents

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ABSTRACT

Problematic internet use (PIU) brings adverse effects ranging from feelings of distress to functional impairment. In fact, PIU shares similarities with substance-related addictions, which further raises concerns over its negative impact. Research has shown that cognitive behavioural therapy (CBT) approaches bring behavioural improvement to those with PIU. This study developed a manual-based CBT programme called the Psychological Intervention Programme – Internet Use for Youth (PIP-IU-Y) – that aimed to tackle PUI by reducing social anxiety and increasing social interaction. The study also intended to train the first batch of school counsellors and apply the programme in secondary schools in Malaysia. Multi-site testing at secondary schools in Malaysia was conducted to validate the effectiveness of the programme. The programme was delivered by registered school counsellors in a group format, with a 90-minute session per week for a total of eight weeks. Two validations of this study were obtained, and both supported the reliability and validity of the programme.

Keywords: Intervention programme, Problematic Internet Usage, Cognitive Behavioural Therapy

INTRODUCTION

The exponential growth in technological change and innovation in recent decades has revolutionised the way we lead our daily lives, especially the way we interact. The widespread use of digital technology in various activities has resulted in a tremendous rise in the number of users worldwide. The surge in 'smart' innovations and applications to our everyday lives have introduced a new meaning to 'convenience' and 'smart living'. While it has had a huge positive impact on society, studies on its impact on society and the individual are only now becoming known and better understood.

It is widely acknowledged that the use of digital technology is accompanied by challenges as well as risks for users. This study looked at the consequences on its users' psychological and behavioural well-being. The recent decade has seen increasing attention on the looming problems of internet addiction. The inability to control one's internet use has adverse effects ranging from feelings of distress to functional impairment (Young & Rodgers, 1998). Research has shown that problematic internet use (PIU) shares similarities with substance-related addictions, particularly in the areas of preoccupation, tolerance, and withdrawal (Griffiths, 2005). Although the physical impact of PIU is relatively less severe, it is evident in the long-term.

Individuals with internet addiction have been shown to have behavioural improvements when they undergo cognitive behavioural therapy (CBT) approaches (Davis, 2001). This study aimed to develop a manual-based cognitive behavioural therapy (CBT) programme called the Psychological Intervention Programme – Internet Use for Youth (PIP-IU-Y). This programme would act as an intervention guide to reduce social anxiety and increase social interaction in an effort to reduce PIU.

The second objective was to train the first batch of school counsellors and apply the programme in secondary schools in Malaysia. Multi-site testing at secondary schools in Malaysia was conducted to further validate the effectiveness of the programme. The programme was delivered by registered school counsellors in a group format, with a 90-minute session per week for a total of eight weeks. Two validations of this study were obtained.

LITERATURE REVIEW

Excessive internet use frequently causes circadian rhythm disturbances, leading to fluctuations in sleep phases and episodes of insomnia (Chen & Gau, 2016; Li, O'Brien, Synder, & Howard, 2015). If these disruptions persist in the long run, the lack of sleep impairs cognitive functioning and psychological well-being (Do, Shin, Bautista, & Foo, 2013; Eickhoff et al., 2015). A number of other

bodily processes, such as dietary behaviours and lifestyle patterns, as well as physiological symptoms such as weakened immunity and a lack of physical energy, may also be affected as a result of internet addiction (Cao, Sun, Wan, Hao, & Tao, 2011; Kim et al., 2010).

Besides that, problematic adolescent behaviours, namely, social anxiety, depression, and hostility, have been found to be significantly associated with PIU (Ke et al., 2014; Ko et al., 2014; Liu, Desai, Krishnan-Sarin, Cavallo, & Potenza, 2011; Ostovar et al., 2016; Wong et al., 2014).

Internet addiction was found to be prevalent among adolescents (Young, 2011; Bruno et al., 2014; Tang et al., 2014), and this has reinforced the belief that intervention is needed particularly among youngsters to prevent psychological issues due to PIU. Incidences related to PIU are also reportedly higher in South East Asian countries. In fact, an epidemiological study indicated that Filipino and Japanese adolescents had the highest occurrences of internet addiction, 51% and 48% respectively (Mak et al., 2014), whereas only 44% of European adolescents were considered pathological internet users (Durkee et al., 2012).

In Malaysia, there have been a number of programmes conducted which target online users such as the Online Safety awareness programme known as 'Klik dengan Bijak' launched by communications and multimedia regulatory body, the Malaysian Communications and Multimedia Commission (MCMC), and programmes addressing online security by CyberSecurity Malaysia (an agency under MOSTI). However, prior to the studies by Ke et al. (2014) and Wong et al. (2014) there were no existing studies or programmes that focused on addressing psychological and behavioural issues of PIU.

Prior to the current study, researchers Ke and Wong had completed two research studies under the Networked Media Research Collaboration Programme, a research collaboration programme initiative of MCMC with universities in Malaysia. The first study, "My Online Friends Understand Me Better": The Impact of Social Networking Site Usage on Adolescent Social Tie and Mental Health (2010-2012), provided insight into the extent of the link between social networking site (SNS) usage and its impact on the user's mental health. The study found evidence of PIU among the youth and that it was affecting them negatively (Ke et al., 2014; Wong et al., 2014).

Subsequently, a pilot study was conducted to design and test an intervention programme to deal with PIU, An Intervention for Problematic Internet Use among Young Adults: A Pilot Study (2013). The results were promising as they showed a reduction in mean from before to after the intervention, indicating the intervention was effective. The findings of this study prompted the researchers to carry out a study on the intervention of high-risk category users, namely adolescents. This study was intended to further refine the intervention programme and carry out a full-scale intervention programme in selected secondary schools across the nation to examine its reliability and validity.

METHODOLOGY

In this study, multi-site testing was carried out in secondary schools. Recruitment of participants in multiple government secondary schools was conducted by requesting voluntary participation in a programme to reduce PIU and social anxiety, while increasing social interactions in real life. Four schools in Selangor participated in the first validation with 45 participants. In the second validation, 22 schools from 12 states and one federal territory participated in the multi-site tests, of which 157 participants completed the programme.

Both validations of the project were carried out in three phases: pre-intervention (T_0), post-intervention (T_1), and follow-up (T_2). Figure 1. illustrates the three phases. In Phase I, three self-report questionnaires were administered to secondary school students and candidates were selected for intervention. In Phase II - the intervention phase, trained registered counsellors in the respective schools delivered the manual-based CBT programme in a group format. The CBT programme was designed by psychologists and registered counsellors and had been validated in a pilot study (Ke, Wong & Marsh, 2013).

The group intervention programme was conducted for eight weeks, consisting of weekly 90-minute sessions. The participants were tested again using similar measures following the completion of the 8-week intervention. After approximately one month, the follow-up session in Phase III was carried out. The participants completed the same three self-report questionnaires to assess if improvements brought by the intervention were maintained.

T_0										T_1			T_2
Pre-intervention	Intervention									Post-intervention			
W1	W2	W3	W4	W5	W6	W7	W8	W9		W10	W11	W12	W13
Pre-study Briefing	Attend a 90-minute weekly CBT intervention session									Follow-up Period			
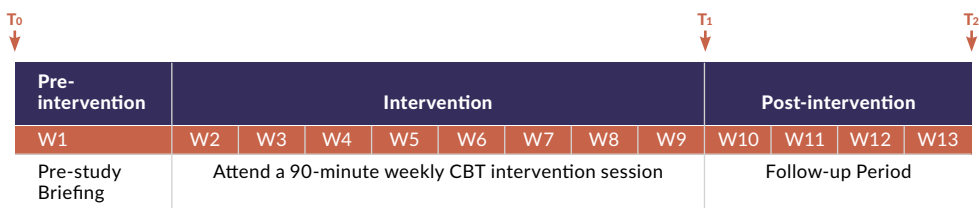
Note: T_0 (Pre-intervention), T_1 (Post-intervention), and T_2 (One month follow-up)

Figure 1 illustrates the three phases. In Phase I, three self-report questionnaires were administered to the secondary school students and candidates were selected for intervention.

The three questionnaires used were the Problematic Internet Use Questionnaire (PIUQ; Koronczai et al., 2011), the Depression, Anxiety, Stress Scales (DASS; Lovibond & Lovibond, 1995), and the Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998). All measures were translated into Bahasa Malaysia, which government secondary school students are more likely to be proficient in.

(a) ***Problematic Internet Use Questionnaire (PIUQ).*** The PIUQ is a validated instrument that measures three dimensions of Problematic Internet Use, which are obsession, neglect, and control disorder (Koronczai et al., 2011). All items are rated on a 5-point Likert scale from 1 (Never) to 5 (Always). The obsession dimension measures psychological fixation with the internet, and the symptoms of worry, anxiety, and depression due to inability to access the internet. Neglect examines the negligence of typical daily activities such as working and eating while control disorder examines one's incompetence in decreasing the amount of time spent on the internet. Overall, participants who scored above 41 were rated as having Problematic Internet Use.

(b) ***Depression Anxiety Stress Scale (DASS).*** The full 42-item scale measures one's current emotional symptoms of depression, anxiety, and stress (Lovibond & Lovibond, 1995). The items are rated on a 4-point Likert scale from 0 (Did not apply to me at all) to 3 (Applied to me very much, or most of the time). Participants were categorised into one of the five groups: normal, mild, moderate, severe and extremely severe for each subscale. Depression subscale scores 0-9 (Normal), 10-13 (Mild), 14-20 (Moderate), 21-27 (Severe), and 28+ (Extremely severe). Anxiety subscale categorises with 0-7 (Normal), 8-9 (Mild), 10-14 (Moderate), 15-19 (Severe), and 20+ (Extremely severe). Similarly, stress subscale groups participant by 0-14 (Normal), 15-18 (Mild), 19-25 (Moderate), 26-33 (Severe), and 34+ (Extremely severe). Overall, a higher score implies severity of one's mental health.

(c) ***Social Interaction Anxiety Scale (SIAS).*** The SIAS is a 20-item instrument that measures the distress level when interacting with other people (Mattick & Clarke, 1998). The instrument is useful in assessing whether social phobia or any other anxiety related disorders are present, as well as in tracking the symptoms over time.

FINDINGS

First Validation

Table 1 shows the summary statistics of the participants' progress in all five groups. The participants' progress was presented using the number of participants who had improved or who had deteriorated in their symptoms for each variable; PIUQ, DASS, and SIAS at Time 1 (T_1) and Time 2 (T_2) in comparison to Time 0 (T_0).

The results showed that more than 50 percent of participants exhibited improvement in symptoms for all variables. At Time 1 (T_1), 68.89 percent of participants improved in PIUQ symptoms, 48.89 percent improved in DASS depression, 48.89 percent had improved anxiety and stress, while 62.22 percent improved in SIAS symptoms. At T_2, more participants showed better improvement with the highest percentage in improved anxiety symptoms (62.22% for SIAS and 68.89% for anxiety). A total of 60.00 percent improved in PIUQ symptoms, 53.33 percent in depression, and 60% in stress.

Table 1: Summary of participants' progress (*n*=45)

Variable	T_1			T_2		
	Improve (Participant %)	Deteriorate (Participant %)	No change (Participant %)	Improve (Participant %)	Deteriorate (Participant %)	No change (Participant %)
PIUQ	31 (68.89)	12 (26.67)	2 (4.44)	27 (60.00)	16 (35.56)	2 (4.44)
DASS Depression	21 (46.67)	21 (46.67)	3 (6.67)	24 (53.33)	21 (46.37)	0 (.00)
DASS Anxiety	22 (48.89)	19 (42.22)	4 (8.89)	31 (68.89)	14 (31.11)	0 (.00)
DASS Stress	22 (48.89)	20 (44.44)	3 (6.67)	27 (60.00)	17 (37.78)	1 (2.22)
SIAS	28 (62.22)	16 (35.56)	1 (2.22)	28 (62.22)	17 (37.78)	0 (.00)

Note. T_0 = Pre-Intervention; T_1 = Post-Intervention; T_2 = Follow-up; Number of participants tabled are based upon score differences of T_1 and T_2 in comparison to T_0.

First Validation
The second instalment of the study further validated the effectiveness of the intervention programme. Table 2 shows the means of the PIUQ, DASS subscales, and SIAS across the three phases of the programme.

Table 2: Comparisons of Means of PIUQ, DASS, and SIAS at three measurement points (*n*=157)

	T_0 (Pre-intervention)	T_1 (Post-intervention)	T_2 (Follow-up)
PIUQ	55.81	45.38	37.22
DASS - D	18.68	13.25	10.53
DASS - A	15.95	11.83	8.84
DASS - S	13.75	10.62	7.59
SIAS	35.99	29.28	23.83

By the end of the intervention, the mean scores for the participant's level of PIU were lower than the baseline (*M* = 45.38), and at the one-month follow-up (*M* = 37.22). There were significant decrements in the mean scores for the DASS subscales of depression (*M* = 13.25), anxiety (*M* = 11.83), and stress (*M* = 10.62) at the end of the programme. At the one-month follow-

up, there was a further reduction observed for the depression (*M* = 10.53), anxiety (*M* = 8.84), and stress (*M* = 7.59) subscales. A significant reduction in mean scores was also observed for the SIAS (*M* = 29.28) at the end of the intervention programme, and a further reduction occurred at the one-month follow up (*M* = 23.83).

A National Counsellors Workshop entitled 'An Intervention Program for Excessive Internet Users' was held on the 14 to 15 April 2016. Organised by the research team, this workshop was funded by MCMC and supported by the Ministry of Education (MOE). The participants of this workshop comprised of school counsellors who were selected by the Jabatan Pendidikan Negeri (JPN), and Counselling Department. Overall, a total of 34 school counsellors across 14 states in Malaysia took part in the workshop.

Counsellors attending the workshop commended the practical value and effectiveness of the program in achieving desired goals. Some notable suggestions from the counsellors were to implement the programme in stages, such as allowing student leaders and Pembimbing Rakan Sebaya (PRS) in schools to be the pioneers of the programme.

DISCUSSION

In the first validation, participant scores from T_1 and T_2 were on average reduced as compared to the first baseline measurement (T_0). This is evident especially in measurements of the PIUQ, SIAS, and DASS-anxiety and stress. Based on observations, over 48-69 percent and 53-69 percent of participants had improved in symptoms at T_1 and T_2 respectively. Similar findings were observed in the second validation, as the majority of the participants showed improvements after intervention and maintained these improvements at follow-up.

Notably, further improvement observed during the follow-up assessment indicated that the participants were able to differentiate between healthy and unhealthy or excessive internet use. These results support the efficacy of the formulated intervention programme in aiding the prevention of problematic behaviour in relation to internet use, and its beneficial effects were still present after 1 month.

Based on the findings, it is evident that some participants still had excessive internet use symptoms after the intervention. The counsellors commented that even though some participants still had excessive internet use, they showed motivation in wanting to improve and control their behaviour. In fact, the counsellors who had implemented the programme observed a noticeable improvement in PIU. They further commented that the participants had begun to think and ask about their future and goals in life.

This suggested that communication skills had improved and the associated positive behavioural change had occurred. Some participants also showed more confidence and assertiveness after the programme, and exhibited a stronger resistance to negative influence by peers.

The current study provided evidence for the effectiveness of the PIP-IU-Y, an internet prevention programme formulated for adolescents. The programme identified PIU as a negative coping style and introduced positive psychological techniques to counter it. Unlike preceding research, the PIP-IU-Y targets prevention rather than treatment. Curbing the rise of internet addiction, particularly in today's younger generation, is paramount as studies have implied that the co-occurring symptoms of PIU are expected to deteriorate with age, negatively affecting quality of life and interpersonal relations (Cheng & Li, 2014; Odaci & Melek, 2010).

RECOMMENDATION

Based on the evidence supporting efficacy of the PIP-IU-Y, the researchers recommend that MCMC establishes an internet addiction prevention programme and set up an internet addiction prevention centre that would not only assist users experiencing negative repercussions of PIU but also assist them to increase face-to-face social skills. For future research, the researchers suggest exploring the impact of new media use on adolescents in relation to problematic behaviours associated with internet use, particularly online gaming and sex/pornography viewing, as well as the role of the family support system. Ultimately, the goal of the current and future research in the area would be to guide adolescents towards a balanced and healthy digital lifestyle and culture.

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Digital Accessibility For All:

Implication towards Digital Inclusion Policy

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ABSTRACT

The study was conducted to investigate the challenges and issues of digital accessibility, facing all users regardless of their abilities and competencies in this new era of Information and Communication Technology (ICT). It was conducted throughout Malaysia to evaluate the challenges of people with disability, who total more than 500,000 people, in using the internet. Most of them have learning and physical disabilities, some are visually and hearing impaired, while others have mental health issues or/and have speech difficulties. A total of 1,200 respondents registered with the Department of Social Welfare participated in the study after a stratified random sampling procedure was used to determine the number of children with disabilities (n=395) and adults with disabilities (n=805). Identified respondents were interviewed using separate survey questionnaires for children and adults. To complement the survey, a Small Group Discussion was conducted to explore in depth any issues that were raised in the quantitative findings. The participants include children and adults with disabilities, parents of disabled children, teachers of disabled students, doctors with disabled patients, caretakers, web developers, and representatives from Non-government Organisations (NGOs). Overall, it can be said that the internet is widely used among people with disabilities regardless of their types of disability and age groups. Even though they faced several challenges, these digitally challenged users have found that the internet can be both useful and beneficial to their wellbeing in many ways. In education, the internet has become a means of learning and knowledge sharing popularised by platforms such as YouTube. The internet is also a great tool for education especially for research purposes or for seeking new things to learn. Other benefits also include ease of keeping updated with current issues and being socially connected with a wider range of people through the use of social media's apps such as Facebook or WhatsApp. In spite of being digitally challenged, these users hardly face any form of bullying, whether by being verbally harassed or cyberbullied by strangers. Despite the educational benefits of the internet to the children, the parents did express their concerns about the excessive use of the internet that may impact their children's social development as these children tend to spend a lot of time alone on the internet, possibly leading to isolation and withdrawal from society.

Keywords: Digital inclusion, people with disability, digital accessibility

INTRODUCTION

In the past four decades, major developments in Information Technologies have led to the rise of digital devices being used for a wide range of functions. These developments have created some of the most promising possibilities but they are not universally designed and made user-friendly for the digitally challenged.

The internet offers an opportunity for inclusivity – to view the global community of its users as one while catering to its user's diversity. Internet technologies have the potential to give users with disabilities the means to live on a more equitable basis within the global community in a manner that previously was not possible.

Significance of Research

This research offers guidance to policymakers on why and how to increase usage of the internet by users with disabilities. While digital accessibility is a key aspect of usage, the scope of the research goes a bit further to consider a broader range of digital products and services. It outlines issues surrounding accessibility, availability, affordability, its challenges and the limitations involved. Policymaker can use findings of this study as a starting point and through the list of references could further investigate mechanisms to increase internet usage among users with disabilities.

This research is in line with USP Regulations 2002 & (Amendment) 2008 objective which is to provide communication accessibility targeting underserved areas or localities, and underserved groups within a community. Underserved groups include people with disabilities, children under protection, women under rehabilitation, and people living in low-cost housing areas.

Through this research, we are hopeful of expanding our work with everyone in the digital community to improve accessibility to the internet for the digitally challenged. If the appropriate digital tools are available, users with disabilities can equally participate in society and make substantial contributions to our economic and social development.

Research Objectives

Prior to this research, there appears to be no detailed research done in Malaysia regarding disabled peoples' actual experiences of getting or being online including any difficulties they encountered, whether they are getting the required assistance, or their views of the benefits of carrying out activities online. The research aimed to fulfil the following objectives:

i.   To find out the degree of internet usage among people with disabilities in Malaysia.
ii. To study their motives of internet usage.
iii. To explore the benefits of internet usage in facilitating their daily lives.
iv. To identify the challenges and barriers of internet usage that they face.
v.   To quantify the user experiences satisfaction among the digitally challenged.
vi. To advocate competency development for the digitally challenged.
vii. To provide empirical evidence for digital inclusion policy formulation for users with disabilities in Malaysia.

LITERATURE REVIEW

Persons with Disabilities (PWD) Act 2008

The Centre for Disease Control of USA identifies four types of disabilities (visual, auditory, cognitive, and motor) that are especially relevant to digital accessibility. Visual disabilities include blindness, colour blindness and low vision (i.e. peripheral constriction or retinal detachment). The latter two vision disabilities make it harder to read information on certain websites with dark backgrounds. Also, reading unusual or small fonts and unclear images are known to be problematic for people with both vision disabilities. People with auditory disabilities such as deafness or the hearing impaired find it challenging when using websites that have audio files or low-quality recordings. Users with cognitive impairments (also called learning disabilities) such as autism, attention deficit disorder, hyperactivity disorder and dyslexia can have difficulties reading text or lack the ability to identify links within a website. Users with physical impairments such as those that suffer from cerebral palsy, multiple sclerosis, muscular dystrophy, rheumatoid arthritis, carpal tunnel, broken bones, or other conditions causing tremors or loss of fine muscle control, often have difficulty using their hands to navigate through online websites. Disabilities may also be caused by age-related diseases (Peters & Bradbard, 2010).

According to Malaysian Persons with Disabilities Act of 2008 (Act 685), disabilities hinder peoples' full and effective participation in society. Any individual who is unable to perform crucial daily life activities that include caring for oneself, difficulties in walking, vision or hearing, speech, breathing or learning, more than the average person is considered an individual with disability (Junaidah & Saodah, 2014).

Based on Department of Social Welfare (DSW) Statistics Report in 2014, there are 531,962 people registered as people with disability. However, it is estimated there are about 4.2 million disabled people not registered under the Department. DSW Malaysia categorise disabilities into six categories, namely hearing, vision, speech, physical, learning difficulties, mental and multiple disabilities.

Digital Inclusion

Digital inclusion is about creating digital solutions as well as digital design and content that can be accessed by all users regardless of cognitive or motor skills. As more services become digital, web accessibility has been increasingly challenging for the digitally challenged. Web accessibility implies that all people – including those with disabilities – can perceive, understand, navigate and interact with the web and that they can also contribute just like any other users (WAI, 2005). Accessibility is about inclusiveness, to ensure that no one is excluded. In some cases, this is not possible and assistive technologies may be called upon to fill the gap. If so, mainstream technologies should enable the software and hardware of assistive device to work seamlessly, in terms of both interoperability and data portability.

Internet Usage among Persons with Disabilities

People with disabilities use the internet as a place for learning. Florian (2004) claims that the internet can be an exhilarating and helpful tool for educational purposes (as cited in Williams, Jamali & Nicolas, 2006). They further suggested that there are multiple websites and software that can stimulate a better learning environment more than traditional learning does. Learning about basic computer operations, how to explore the internet and playing online games provide new knowledge as well as entertainment for them. The act of learning still takes place even with all the fun that they experienced (Moisey & Keere, 2007). Moisey and Keere (2007) further argue that this knowledge will help them to fit into places that they are not able to before such as internet cafés, online fairs and even game competition events.

Johnson and Hegarty (2003) highlight that websites can be used as educational motivators for people with disabilities since they offer fast access, interesting graphics and can be altered to suit the students' interest (as cited in Williams, Jamali & Nicolas, 2006). Virtual Learning Environment (VLE) is a useful learning tool for persons with autism and Asperger. VLE trains one's social skills by allowing them to experience real life situations without leaving the house. This enables them to manipulate the situation to suit their interests and avoid embarrassment if they are unable to react properly (Williams, Jamali & Nicolas, 2006). These aspects are important because one might be discouraged when they feel humiliated. VLE provides simple scenarios such as asking for a table in a café and finding a seat in a bus (Williams, Jamali & Nicolas, 2006). These might seem like simple social skills, nevertheless these will aid them to participate more in the virtual and real world (Moisey & Keere, 2007).

METHODOLOGY

Research Design

The study employed a mixed-method approach where both the quantitative research design and the qualitative research design were done in sequence, respectively.

For the quantitative research design, a survey method was used to collect data from both groups of people with disabilities. The children' category was done first, followed by the adults' category. For the qualitative research design, a group discussion method of data collection was used to ascertain the findings from the survey method for both.

Research Instrument

Two sets of specially constructed questionnaires (Children and Adults) were used to achieve the research objectives.

The survey first determined users and non-users of the internet. Non-users were asked the reasons for not using the internet and then directed to complete the survey by filling in their demographic characteristics, which was also collected for internet users. The survey obtained details of gender, age, race, level of education and language proficiency among the children and the adults as well as types of disabilities.

The internet users had additional questions to answer pertaining to their internet usage: frequency of usage, time spent, and the importance of usage. They were also asked about the motives of the internet usage. The survey also sought to understand the benefits obtained from their internet usage in facilitating their daily lives. The questions on that subject elicited responses from areas such as educational/intellectual, business, entertainment, religious, political, personal, social and information/news. The challenges and barriers they face were also explored, and the questions were specific to the types of the disabilities as well as other challenges that affect all types of disabilities. Users' satisfaction is also included in the study and it sought information regarding service quality, product information, customer service, billing, charges, and service satisfaction. In addition, the types of competencies with respect to digital skills are also included in the questionnaire (Appendices) and such competencies cover technical competency, cognitive competency, and personal competency.

The questionnaires comprised of several parts, which include close-ended and open-ended questions. Suggestions and comments from the respondents were also tapped.

Sampling

This study used the stratified sampling procedure where the respondents were grouped into two categories: children with disabilities and adults with disabilities. Children above the age of 10 years were included as this is the age where the computer and the internet usage are used in schools. The adult category included those 18 years of age and above.

In order to get 99 percent confidence level, the sample size required 1,200 respondents. The study managed to identify 395 children with disabilities and 805 adults with disabilities.

Data Collection

The questionnaires were subjected to validity and reliability through a pilot study conducted in June 2017. A total of 43 respondents (20 children and 23 adults) participated in the study. The questionnaires were improved; and the scales reduced to a yes (1) and a no (0), i.e., in dummy nominal measurement except for satisfaction where the items scale was reduced from 5- to a 4-point Likert scale of 1=not satisfied at all, 2=not satisfied, 3=satisfied, and 4=very satisfied. The questionnaires were made much simpler as recommended by MCMC. Only the satisfaction items were subjected to a reliability test as they were measured using a scale measurement. The reliability results for the overall 32-item (n denotes the number of items) satisfaction is Cronbach alpha (α) of .974. Specifically, each dimension is also reliable where service quality (n=8, α=.930), product information (n=6, α=.957), customer service (n=8, α=.973), billing (n=5,

α=.969), charges (*n*=2, α=.912), and delighting consumers (*n*=3, α=.937). Therefore, no item was deleted from the satisfaction construct.

Validity was also obtained by obtaining expert opinion from MCMC and from a Director of the Unit for the Disabled Persons at a higher learning institution.

Child participants for the survey were obtained with the permission and cooperation of the Ministry of Education, which supplied lists of schools having children with disabilities for all states. Similarly, for the adults, the Ministry of Social Welfare was contacted, and permission was granted to carry out the research. Appointments were made with the respective schools and companies which have hired adults with disabilities throughout the nation (Peninsular Malaysia, Sabah and Sarawak). The data collection for the children was completed first even though the data collection for adults started almost at the same time. The data collection for the children was carried out between August and October 2017 while for the adults, it was between September and December 2017.

The Focus Group Discussion (FGD), which was the second phase of the study, involved persons with disabilities (children [6] and adults [5]), parents [3], teachers [5], caretaker [1], medical doctors [2] and web/apps developers [3]). A total of 22 FGD participants attended a half-day gathering on 12th December 2017. In addition, 11 members from the organising committee were involved, making a total of 33 persons.

Data Analysis

A software data analysis of Statistical Package for Social Sciences (SPSS) Version 20.0 was used to analyse the quantitative data while the ATLAS.ti version 10 for qualitative data.

In qualitative data, the answers were recorded and compiled into a verbatim transcription for both groups: Children (n=10) and Adults (n=12). Similar questions were directed to the two groups. However, each group's facilitators asked only questions relevant to the respective target group. Once the transcription for each group was completed, themes for each objective were identified and the ATLAS.ti program was used to further develop the mapping derived from the themes.

FINDINGS

1. Most respondents, 84.1 percent use the internet, but there was a sizeable proportion who have not gained access (15.6 percent).

2. People with disabilities belonging to the youngest age category were consistently more likely to use internet than persons belonging to older age categories. According to the research findings, internet usage was higher among children with disabilities (95.4 percent) as compared to the adults with disabilities (78.5 percent).

3. The internet usage pattern is very similar to that in the general population. The MCMC Internet Users Survey 2017 (IUS2017) shows that the use of internet for communication and socialisation were the highest, with texting via over the-top (OTT) at 96.3 percent and visiting social networking at 89.3 percent. These were followed by information gathering activities (86.9 percent) and leisure activities (72.7 percent). For persons with disabilities, the three of the most frequent reason for internet use are shown in Table 1.0.

Table 1: The Internet Usage Pattern

Frequent reason	Children with disabilities (percent)	Adults with Disabilities (percent)
For communications and socialisation	31.4	30.0
For getting information and news	29.8	43.5
For relaxation-games, songs, drama (Entertainment)	21.0	13.5

single answer

4. People with disabilities who were able to access and use the internet reported notably larger benefits from the internet in some areas than was the general population. Adults with disabilities were more likely to believe that the internet increased their general knowledge (81.0 percent), improved their knowledge on personal well-being (76.1 percent), helped them to improve their relationship with friends and family members (82.3 percent), and expanded their social networking (73.4 percent) than the general population. Meanwhile, children with disabilities also experienced the same benefits.

5. Other than the clear potential socialisation and communication benefits, the internet also offered an enormous array of new ways to pursue education and employment. 78.5 percent of adults with disabilities said that the internet had facilitated them in searching for reference for their life-long study/education and 55.9 percent claimed that the internet had increased their opportunity to find a better job.

6. Despite all these benefits, people with disabilities face significant challenges and barriers to access the internet. According to the research findings, they face different challenges in accessing the internet as below:

Table 2: Challenges to Access the Internet by disabled people

Type of disability	Challenges
Visually impaired	Lack of compatibility of Web content with screen readers such as magnifier.
Hearing impaired	Lack of textual equivalents of audio content, interactive Web chats and other conferencing features, subtitle, sign language.
Speech Difficulty	Lack of speech recognition applications.
Learning difficulties and Mental Disabilities	Difficulty to understand certain terms on the internet as well as functions to use the internet.
Physical Disability	Cannot type properly on the keyboard and mobility limited (difficulties in paying bills, attending ICT classes and so on).
All type of disabilities	Internet too expensive for them. Some applications not user friendly. Too many inappropriate materials available.

7. Respondents also gave feedback on their overall broadband experience provided by their service providers based on six (6) criteria namely Service Quality, Product Information, Customer Service, Billing, Charges and Delighting Customer. Based on the research findings, they are more satisfied with service quality, product information and billing.

8. People with disabilities were mainly positive and confident about their own digital skills and competences especially on Technical Competency, such as downloading Videos/Photos/Images/Songs, using search engine and so on.

9. Overall, for adults with disabilities, most of the respondents (68.5 percent) were from low income category (Less than RM1,000), with an average income of RM739.66 per month. Meanwhile, nearly half of them (54.1 percent) had received secondary education.

RECOMMENDATION

Persons with disabilities can equally participate in society and make substantial contribution to the economy if the appropriate internet tools are available. Furthermore, people's attitudes towards disability need to change in order to achieve greater accessibility. Finally, the government should pursue a robust legal program to promote equal access through the National Welfare Policy, National Social Policy 2003, Person with Disability Act 2008 and Article 8 of the Federal Constitution of Malaysia. These laws create the most comprehensive legislative approach to accessibility in Malaysia by focusing on the civil rights aspects of disability, which emphasise the ways in which society can better allow individuals with disabilities to function.

CONCLUSION

This study provides answers to several important questions regarding the internet and persons with disabilities. It revealed the extent of internet usage among persons with disabilities, the motives of internet usage, the benefits, the challenges, and satisfaction of the internet usage among persons with disabilities.

The internet is widely used by people with disabilities regardless of their age and type of disabilities. Although they face several challenges, the users obtain a lot of benefits from using the internet. The internet has caused a transformation in the areas of knowledge, work, life, and social communication. In the area of education, the internet has become a means of learning and knowledge sharing, as well as easy communication between academics. In the area of work, the skills required to use the internet have become part of the basic criteria to compete in the labour market. Also, the internet contributes the facilitation of social communication (Osman, 2007). ICTs offer great potential to support lifelong learning for all groups of students, including those who have special educational needs. The application of the internet must enhance independence, integration, and equal opportunities for such people and in this way will facilitate their inclusion in the society as valued, respected, and contributing members.

The parents of disabled children are concerned about the excessive use of the internet among their children, although they acknowledge its educational benefits . They are concerned about social development of their children being delayed as the children spend a lot of time on the internet. At the same time, parents agreed that the internet helps their children to learn through various platforms on the internet such as YouTube.

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A Survey of Internet Centres and their Role in the

Digital Inclusion of Marginalised Communities, including Senior Citizens

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ABSTRACT

Considering the potential of internet use in everyday life, it is vital to examine the means to empower all Malaysian communities, including rural community, women, and older adults or senior citizens, to embrace the information age. The government, through MCMC and other agencies, introduced a number of initiatives to ensure the digital inclusion of the various marginalised Malaysian communities, irrespective of age or gender, so that no group is left behind. Despite these initiatives and specific policy implementation, not everyone has come on board. Unfortunately, while internet usage on the whole is rising in Malaysia, its use among the rural communities and ageing population is still relatively low. Senior citizens, especially among the marginalised and lower income groups appear to have certain fears in adopting digitalisation as part of their lives. Several rural communities also appear to be lagging behind in the adoption of the internet and ICTs. One key government initiative to digitalise the nation by reaching out to the marginalised communities has been through the establishment of the Internet Centres or Pusat Internet (or formerly Pusat Internet 1Malaysia (Pi1M) or 1Malaysia Internet Centres), where free training and cheap access to internet facilities are offered.

Thus, this study was conducted first, to examine the motivations and obstacles faced by senior citizens that may determine their intentions to go online actively, or to reject or limit their use of the new media technologies; and second, to evaluate the roles and functions of the Internet Centres, and the challenges they faced as well as the perceptions held by the users about the impact and effectiveness of the centres.

Four different research tools were used for this study. The first and second stages of this study comprised an exploratory study, which employed two methods - Focus Group and Questionnaire Survey - to collect data from senior citizens to answer the research questions. Participants for this exploratory study were selected through convenient and purposive sampling to ensure a better response rate as well as diversity and representation in the sample (males and females; Malay, Chinese and Indians; age group of 60-69 years and 70 years and above). The third and fourth stages of this study involved a survey to get perceptions about the Internet Centres from the users and managers of selected centres. Participants were selected through convenient and purposive sampling to ensure a better response rate as well as diversity and representation in the sample (males and females; age groups of 12-24 years, 25-59 years, and 60 years and above). Qualitative interviews, using a guided questionnaire, were also conducted with the manager, assistant manager and one influencer (or Centre partners) from each selected centre to get their opinions about the Internet Centre and its services.

The survey showed that the establishment of the Internet Centres is beneficial on many fronts. It is clearly a learning centre for the community, and in many cases also acts as a social and economic change agent for the community. The Internet Centre has helped to transform the ICT illiterate to become ICT savvy and to provide high speed internet to some extent. This has had an impact on incomes of local entrepreneurs as well as educational achievements of community children.

It also appeared that a number of the centres are providing "space" for social engagement among the community members in efforts to encourage their use of the internet and Wi-Fi facilities at the internet centres. If it becomes the intention of the relevant authorities to add to the objective of the Internet Centre to also serve as a local social community centre, then they will have to re-focus their priorities and communication strategies.

New challenges in terms of the technological advancements in devices for access (for example from laptops to mobile phones) and the evolution of its usage as well as the increasing pervasiveness of ubiquitous wireless internet connections suggest new considerations for the way forward of the Internet Centres. Until such time as when there is equitable access to digital technology, the Internet Centre continues to perform an important function in bridging the digital divide between the internet savvy and the computer illiterate or technologically challenged. While internet access through the mobile phone is growing and mobile broadband is providing internet access to all, there is still a need to access the internet on the laptop or computer for fuller participation in the digital economy and related functions requiring more sophisticated technology. Not many in marginalised groups can afford multiple devices and the Internet Centre can be viewed as part of a "workaround ecosystem," in lieu of the lack of other public facilities like a public library or a community centre offering such facilities.

Every community and every group contributes to national aspirations as a part of the whole ensuring a well-oiled cog in the wheel. At the heart of the commitment of any state, as clearly stated in the Sustainable Development Goals agenda, is to "Leave no one behind."

INTRODUCTION

"If the world is to eradicate poverty, address climate change and build peaceful, inclusive societies for all by 2030, key stakeholders, including governments, must drive implementation of the Sustainable Development Goals (SDGs) at a faster rate."[1] Of the 17 SDGs, Goal 10 on "Reduce inequality within and among countries" is probably reflected in the collaborative effort to bridge the digital divide, and promote digital inclusion of marginalised rural communities through the establishment of the Internet Centres. As stated in the Sustainable Development Goals Report 2017, "empowering vulnerable groups is critical to ending poverty and promoting prosperity for everyone, everywhere." [2]

1 Sustainable Development Goals Report 2017, UN Secretary General Antonio Guterres.
2 Sustainable Development Goals Report 2017, UN Under-Secretary-General for Economic and Social Affairs, Wu Hongbo.

Digital inclusion refers to empowering people through information and communication technologies (ICTs) to ensure equal and fair opportunity for all sectors of society, especially marginalised groups, to democratically participate in the political, economic and social spheres toward holistically achieving a sustainable and healthy society. Considering the potential of internet use in everyday life, it is vital to examine the means to empower all Malaysian communities, including rural and indigenous groups, women and older adults or senior citizens, to embrace the digital information age.

The government, through the Malaysian Communications and Multimedia Commission (MCMC) and other agencies, introduced a number of initiatives to ensure the digital inclusion of the various marginalised Malaysian communities, irrespective of age or gender, so that no group is left behind. Despite these initiatives and specific policy implementation, not everyone has come on board. Unfortunately, while internet usage on the whole is rising in Malaysia, its use among the rural communities and ageing population is still relatively low. Senior citizens, especially among the marginalised and lower income groups, appear to have certain fears in adopting digitalisation as part of their lives. Several rural communities also appear to be lagging behind in the adoption of the internet and ICTs.

Adopting all facets of the Fourth Industrial Revolution, or IR 4.0, poses a challenge for the country when almost 25 percent of its citizens are still lacking access to broadband. MCMC has established more than 840 Internet Centres in rural areas throughout the country in efforts to bridge the gap between the ICT buta (illiterate/challenged) and the ICT celik (savvy). Some centres are also established in the urban poor areas to serve the marginalised communities in the city. MCMC collaborates with key telecommunication service providers to finance and manage operation of the centres based on pre-set standard operating procedures.

This study explored four key objectives:

1. To evaluate the perceptions of the effectiveness of the Internet Centre,
2. To investigate gaps in expected role and functions of Internet Centres and challenges faced by all communities served by these centres in their use of them,
3. To investigate the digital inclusion of senior citizens and the challenges faced by them, and
4. To assess and provide recommendations on policy implications for enhancing effectiveness of the Internet Centres.

METHODOLOGY

Data was collected through three (3) research stages over a period of ten (10) months to investigate the above objectives.

First Stage
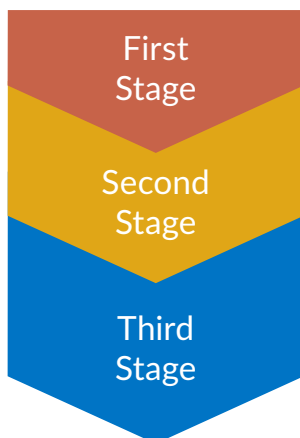
Focus Group Discussion
Two focus group interviews with **20 senior citizens**, one each in an urban and a semi-rural area

Second Stage

Survey (Senior Citizens)
A self-administered survey using a close-ended questionnaire among **100 urban senior citizens**

Third Stage

Survey (Internet Centres' Users) and Interview
A questionnaire survey of **3,547 members, users and selected individuals living nearby from 61 Internet Centres nationwide**, as well as **183 qualitative interview**s with the centre manager, assistant manager and an influencer or champion of the selected centres.

The data from the surveys was analysed using SPSS while the interviews were analysed thematically and through a SWOT analysis.

FINDINGS

Objective 1: Perceptions of the effectiveness of the Internet Centre

According to Table 1, almost all respondents, 1,737 (99.3 percent) males and 1,783 (99.2 percent) females, had heard about Internet Centres.

Generally, the findings showed that both male and female users of all ages regarded the Internet Centres in their communities as being very useful for their educational, social and economic development. Several local entrepreneurs have the centres to thank for the expansion in their business and an increase in their income. The entrepreneurs learned how to use internet and digital technology to brand and promote their products and services to a wider customer base. Future generations from the rural poor are also being given the opportunity to compete with their peers globally through early exposure and guidance on how to use internet for educational purpose. The centres provide communities with free and affordable access to internet; thus enabling their full participation in all transactions necessary for a productive life.

Table 1: Usage of Internet Centre according to gender (frequency and percent)

	Gender		Total
	Male **N (percent)**	**Female** **N (percent)**	**N (percent)**
Have you heard about Internet Centre?			
Yes	1737(99.3)	1783(99.2)	3520 (99.3))
No	12(0.7)	14(0.8)	26(0.7)
How did you hear about Internet Centre?			
Community talks/events	444(25.6)	548(30.7)	992(28.2)
Through friends and family	1060(61.0)	1073(60.2)	2133(60.6)
Through media (newspapers, radio, TV, internet)	504(29.0)	631(35.4)	1135(32.2)
I have passed one	1031(59.4)	1163(65.2)	2194(62.3)
Through residents of the community	601(34.6)	734(41.2)	1335(37.9)
Have you visited Internet Centre?			
Yes	1712(97.9)	1760(97.9)	3472(97.9)
No	25(1.4)	23(1.3)	48(1.4)
Not applicable (Those who have not heard about MIC)	12(0.7)	14(0.8)	26(0.7)
Top three reasons for visiting Internet Centre			
To communicate with friends and family	812(47.4)	717(40.7)	1529(44.0)
To browse the internet for news/research (education/health information)	820(47.9)	931(52.9)	1751(50.4)
To attend the ICT training programmes	428(25.0)	520(29.5)	948(27.3)
To attend the entrepreneurial/e-marketing programmes	218(12.7)	325(18.5)	543(15.6)
To do online banking/pay bills	187(10.9)	246(14.0)	433(12.5)
To shop online	140(8.2)	164(9.3)	304(8.8)
To play online games	343(20.0)	142(8.1)	485(14.0)
To watch movies/for entertainment videos	590(34.5)	395(22.4)	985(28.4)
To apply for jobs online	186(10.9)	215(12.2)	401(11.5)
To do e-marketing for my business	78(4.6)	115(6.5)	193(5.6)
To do printing/faxing/photocopying/laminating	584(34.1)	748(42.5)	1332(38.4)
To apply for government benefits (BRIM, etc.)	389(22.7)	460(26.1)	849(24.5)
To use for e-government services (Income tax, university/college application, etc.)	169(9.9)	197(11.2)	366(1.0)
To check examination results	300(17.5)	373(21.2)	673(19.4)

Besides that, a test analysis of One-Way Anova was conducted to test differences in the level of agreement on information regarding the centres among the three age groups. The initial analysis regarding the mean scores for all factors showed that the scores were highly skewed. In addition, the assumption of homogeneity of the variances was not met. Hence, the non-parametric Kruskal Wallis test was conducted and the results are summarised in Table 2:

Table 2: Testing for differences in the level of agreement on information regarding the Internet Centres among the three age groups

	Age	N	Mean ranks	p-value
1. INFRASTRUCTURE				
A. How accessible and secure is MIC?	12 – 24	1,500	1548.69	0.000
	25 – 59	1,375	1801.52	
	≥ 60	536	1901.20	
B. How do you rate the physical facilities in MIC?	12 – 24	1,502	1618.63	0.000
	25 – 59	1,374	1769.42	
	≥ 60	534	1791.45	
C. How do you rate the ICT facilities in MIC?	12 – 24	1,501	1592.49	0.000
	25 – 59	1,371	1763.42	
	≥ 60	523	1829.32	
2. MANAGEMENT/ADMINISTRATION				
A. How reliable is MIC in providing services?	12 – 24	1,500	1546.63	0.000
	25 – 59	1,369	1781.36	
	≥ 60	535	1937.74	
B. How knowledgeable and helpful is the staff at MIC?	12 – 24	1,502	1589.71	0.000
	25 – 59	1,372	1770.32	
	≥ 60	535	1861.16	
C. What feedback mechanism is available in the management of MIC?	12 – 24	1,449	1576.39	0.000
	25 – 59	1,344	1713.86	
	≥ 60	487	1628.80	
3. PROGRAMMES/SERVICES				
A. How satisfied are you with the services provided at MIC?	12 – 24	1,478	1571.49	0.000
	25 – 59	1,361	1759.59	
	≥ 60	514	1761.71	
B. How satisfied are you with the training programmes run by MIC?	12 – 24	1,482	1583.86	0.000
	25 – 59	1,345	1720.41	
	≥ 60	485	1701.24	
4. HOTSPOTS (SPOKES OR FREE WI-FI)				
A. What is the satisfaction level of MIC hotspots?	12 – 24	1384	1505.83	0.311
	25 – 59	1208	1468.03	
	≥ 60	372	1442.72	
B. Do you know the location of MIC Wi-Fi areas?	12 – 24	1360	1437.22	0.026
	25 – 59	1201	1523.54	
	≥ 60	389	1461.01	
5. OVERALL USER SATISFACTION				
	12 – 24	1,486	1589.84	0.001
	25 – 59	1,342	1720.61	
	≥ 60	476	1656.11	

p-value of <0.05 indicates significance in perceptions or level of agreement among groups

- The results showed that there were significant differences in the level of agreement for all factors among respondents from the three age groups for all factors except for their satisfaction level regarding hotspots. In order to determine which age groups differed for each factor, the Dunnett T3 multiple comparison test was done.
- For the factor on the accessibility and security of Internet Centres, the level of agreement of those aged between 25 and 59 years and those aged 60 years and above were significantly higher than that of the younger age group. In other words, the level of agreement of the middle and older group was higher than that indicated by the younger age group.
- The Kruskal Wallis test showed that there were significant differences in the level of agreement regarding the physical facilities at the centres among the age groups. However, the Dunnett T_3 results showed there was no significant difference. If the mean ranks for this factor was examined, it can be seen that there was not much difference in the mean ranks. Hence, the level of agreement regarding this factor was the same among all age groups.
- Both the middle group and the older group had significantly higher level of agreement regarding the ICT facilities at the centres. Respondents from these two age groups rated the ICT facilities higher than the younger group. There was no difference in the ratings among the middle and older groups.
- The same two groups also agreed that the centres were reliable in providing the services more so than the younger age group. In addition, the level of agreement for this factor was similar for the middle and older groups.
- The results were also similar for perceptions on how knowledgeable and helpful the staff were at the centres. Both the middle and older groups had a significant higher level of agreement regarding this compared to the younger group.
- Respondents aged between 25 to 59 years had a significantly higher level of agreement regarding the feedback mechanism available in the management of Internet Centres compared to the younger (12-24) and older aged groups (60 and above).
- Both the middle and older aged groups were more satisfied with the services provided at Internet Centres than the younger group.
- Those in the middle group were more satisfied with the training programmes than the younger and older aged groups.
- The respondents' satisfaction level of Internet Centres is the same for all age groups. Still the middle group were more satisfied with the location and free Wi-Fi areas compared to the other two age groups.
- The same results were recorded for overall user satisfaction. Those aged 25 to 59 years were more satisfied than the younger and older aged groups.

SWOT Analysis of Perceptions of Internet Centres

A SWOT analysis suggested the following perceptions held by a sample of the various stakeholders regarding the strengths, weaknesses, opportunities and weaknesses of the internet centres. Only the top three responses are listed for each aspect.

Strengths (Internal Factors)

√ Intern fees at a lower cost
√ Basic ICT skills training
√ Good ICT facilities (Computer, Printer, Photocopy Machine) in a safe and conducive environment

Weaknesses (Internal Factors)

√ Excessive work obligations and KPIs for the managers
√ Inadequate advanced training to upskill the staff
√ Insufficient budget to run activities related to the community (awareness programme)

Opportunities (External Factors)

√ Possession of digital device
√ Affordable cost offered to access the Internet
√ Availability of ICTs facilities

Threat (External Factors)

√ Exploitation of the Internet Centres
√ Inadequate support from service providers
√ Interference by local political influencers in the community

Objective 2: The gaps in expected role and functions of the Internet Centres and challenges faced by all communities served by these centres

A number of centres encountered varied challenges that hampered optimum use of their services. These included under utilisation of services in the centre through a lack of continuous attendance for courses, slow internet speed during high traffic use, low literacy and education levels, disinterest in new technology, a lack of awareness of the inherent benefits of the centre as a change agent or as an entrepreneurial hub, inexperienced or untrained managers and assistant managers, and sometimes interference from local political leaders.

Internet Centres can contribute towards digitalising the community they serve. Generally, while the Internet Centres have contributed to increased internet usage, there remains a need for more aggressive publicity and promotion regarding the benefits to all age groups,

especially to senior citizens. In addition, problems like low literacy levels as well as language problems among the Indian, Chinese and indigenous communities in the lower economic group (who cannot read and write in English or Malay) hinder their use of the internet. This was found among both young and adult users in centres in rural Peninsular Malaysia as well as in Sabah and Sarawak. Some of these communities also had limited access to high speed internet or free Wi-Fi.

While the Internet Centre may have had a different initial objective to serve mostly adult users, in some cases it was observed that children as young as three to five years old were using internet in the centres - building their skills in educational games, digital art lessons, and the alphabet programmes. Some centres collaborated with kindergartens and schools to hold weekly ICT related classes, which were popular. The interest shown by these young ones can be taken to be an unintended benefit to the community - of a future generation growing up to compete on an equal platform with their peers in the bigger cities, with the possibility to contribute to future economic and social development. The Internet Centre managers were also assisting primary and lower secondary school children with school assignments requiring power point presentations and multimedia applications.

Additionally, managers without the necessary skills and qualifications were required to "build" local entrepreneurs. While they could assist in developing basic digital promotional techniques, most actually lacked the knowledge and training for professional digital marketing or entrepreneurial development, and hence could not deliver as required. However, occasionally the centres assisted other business development agencies in such endeavours.

Objective 3: The challenges and motivations to digital inclusion among senior citizens

Digital inclusion of the ageing population is and should also be a priority of the centres with specific attention given to increasing support and resources to ensure a higher take-up of ICT from this marginalised section of the population in the digital world. The study found that most of the senior citizens were not concerned about using internet, social media apps, or adopting new media technologies as they thought them to be irrelevant with no important impact on their lives. Low literacy and education levels were also some of the barriers for their use of the internet. Physical handicaps like poor eyesight, poor memory, and the inability to digest new technical information were also some of the reasons given by them for their rejection to hop onto the digital bandwagon. Very few senior citizens were members of or visited the Internet Centres to use internet. Of those who visited, more went for photocopy services or to get assistance for e-government services and official letters.

Table 3: Internet usage among urban senior citizens by age and sex

Do you use the internet? N=91 (9 respondents did not have any digital device)	Frequency							
	60 – 69 years				70 years and above			
	Yes		No		Yes		No	
	45		16		13		17	
	Male	Female	Male	Female	Male	Female	Male	Female
	21	24	11	5	7	6	9	8

Table 4: How urban senior citizens are connected to internet

If yes, how are you connected? (N=58)	Frequency	
	Yes	No
a) Mobile	39	19
b) Wi-Fi hotspot areas	23	35
c) Home Broadband	22	36

Both the focus group discussions and the exploratory questionnaire survey among urban senior citizens provided almost similar results to the survey at the Internet Centres.

i. Whether the senior citizens see the relevance and perceived usefulness to go online or improve their internet skills very much determined their level of participation in the adoption of the new media and ICT skills.
    • Focus group participants, in particular, cited a decreased necessity to keep up with information for necessary 'work purpose' (due to changing expectations and retirement factors).
    • About a third of the respondents in the urban senior citizen survey also did not perceive usefulness of the internet and believed it to be irrelevant to their lives.

Table 5: Reasons for urban senior citizens not using the internet

If you do not use the internet, explain why? (N=35)	Frequency	
	Yes	No
a) I do not have the skills or confidence to use internet on my own	26	16
b) I do not have internet at home as I think it is too expensive	5	37
c) It is hard to find locations with internet in my community	1	41
d) I am not interested to use the internet	21	21
e) It is not relevant to me	16	26

- Generally, the urban senior citizens who used internet did so for similar key motivations – to keep themselves updated on information, seek information, and stay in touch with family and friends. None actually used it for business or commercial reasons, nor was it used much for entertainment.
- WhatsApp was the most frequently used OTT app, while use of social networking sites was minimal, with Facebook being the most popular.

Table 6: Social media applications used by urban senior citizens

Which of the following social media apps have you used before? (N=58)	Frequency	
	Yes	No
a) WhatsApp	56	2
b) Twitter	5	53
c) Instagram	9	49
d) Telegram	3	55
e) Facebook	30	28
f) YouTube	11	47
g) Skype	6	52
h) Snapchat	18	40
i) WeChat	5	53

ii. Key obstacles to the use of internet and social networking sites by senior citizens were:
- Lack of familiarity with internet and use of SNS;
- Fear of difficulty in adopting and adapting to new technology and learning everything from A-Z;
- Fear of cybercrimes, distrust concerning online transactions, and apprehension about downloading new apps or using apps.
- The Focus Group participants also stressed lack of affordability and of access to training and affordable quality technical support as factors for not keeping abreast with the advances in the ICTs or being active on the SNS.
- They also cited physical handicap as a reason, including eye strain and poor eyesight to read online and on mobile digital devices.

Table 7: Reasons urban senior citizens use the internet and social media applications

What do you use the internet and/or social media apps for? (N=58)	Frequency	
	Yes	No
a) To communicate with friends and family	53	5
b) To get information I need (for education, health, work related)	43	15
c) To get news on what's going on in the country	34	24

Table 7: Reasons urban senior citizens use the internet and social media applications

What do you use the internet and/or social media apps for? (N=58)	Frequency	
	Yes	No
d) To do banking online/pay bills	14	44
e) To use the e-government services	10	48
f) To shop online	8	50
g) To play games	2	56
h) To watch movies, and/for other entertainment	12	46

iii. Possible future use of internet by urban senior citizens
When asked if they saw any change in their future use of the internet, the response was unenthusiastic towards any considerable increased use. Most of the senior citizen participants in the research were not convinced about the usefulness of the internet. They thought that they were too old for new technologies. They also said they were not interested in learning how to access the internet as it meant learning something new which they perceived to be difficult.

Perhaps there is a need to review existing strategies and ICT teaching modules to ensure the inclusivity for all groups, including senior citizens.

RECOMMENDATION

Based on the findings, below are the suggestions for enhancing the effectiveness of the Internet Centres:

- Ensure a conducive environment for independent decision making by the Internet Centre, without any political interference;
- Ensure inclusivity of all marginalised communities through dedicated actions such as targeted outreach programmes, aggressive publicity and promotion regarding the benefits of the Centres to all communities, especially to senior citizens and the indigenous community;
- Increase training opportunities to upskill the managers and assistant managers on the latest ICT software and apps and provide the latest modules and guides in relevant areas;
- Ensure regular strategic engagement and consultation with the community and its leaders whilst being mindful of their culture and beliefs;
- Ensure disabled-friendly access and facilities;
- Maintain a focus on the manager's role and responsibilities for quality delivery; and
- Increase the support from participating service providers to the Internet Centres for a more robust community engagement.

CONCLUSION

The centres have positively impacted the communities that they serve. These include their roles as learning centres and social and economic change agents for the communities concerned. The centres have also provided training and access to relatively higher speed internet with positive outcomes on building ICT literacy, facilitating entrepreneurial participation through the use of ICT and the internet as well as contributing to educational achievements of community children. The centres have an impact on their social mobility by building their digital skills within a safe environment whilst exposing them to opportunities beyond the confines of their community and allowing them to compete with peers in the cities.

In addition, the positive outcomes outweigh the negative at the majority of the centres. However, some goals have not quite been achieved for a number of reasons (these include the KPI for measuring the outcomes of ICT training). Therefore, more needs to be done to better understand local culture and needs of the community through regular strategic engagement and consultation with the community to ensure increased impact of the centres upon the community.

Some centres are playing a role beyond providing internet access and ICT and Entrepreneurial training, in that they have inadvertently become the centre for the community's social activities. This provides an opportunity to rethink and expand the role of the centres to position them as an integral fabric of the community.

The continued relevance of the centres in light of recent technology trends and different forms of digital divide impacting society today is also noted. Malaysia is increasingly a mobile-first country insofar as internet connectivity is concerned. The majority of less affluent users may not necessarily have the means to purchase personal computers or laptops and the mode of accessing the internet is primarily via their smartphones. The centres have shown that community access through PCs has been a boon in assisting them to conduct their entrepreneurial, technical or educational activities.

The centres continue to play a role in addressing the digital inclusion agenda. However, the success of the centres does not lie solely through ensuring infrastructure and homogeneous assessment of community requirements. Targeted measures must be tailored to specific groups and the role of the centres must involve community participation and their leaders and serve the community in ways beyond ICT access and training. Every community and every group contribute to national aspirations as a part of the whole, each becoming a well-oiled cog in the wheel. At the heart of the commitment of any state, as clearly stated in the Sustainable Development Goals agenda, is to "Leave no one behind."

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Touch it and Feel it:

Modelling of 3D Haptic Objects to Counter Internet Browsing Limitations for the Visually Impaired Persons

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ABSTRACT

This study explored potential intervention to improve the accessibility of internet browsing among the visually impaired (VI) people in five states in Malaysia through the adoption of the Assistive Technology (AT) in the form of haptic and audio feedback system, and the development of a VI-friendly website known as JomJe (jomeje.homeislab. com). As such, the first part of the study was exploratory and investigated the awareness, knowledge, use, barriers of adoption of ATs and internet among VI individuals. We also analysed the perception and usability experience of the implementation of the haptic-audio based interactive virtual environment. Specifically, we investigated how visually impaired individuals access spatial orientation/layout, mobility of the shape, weight, and features of 3D virtual objects for a website. A field test with 200 participants and structured questionnaires to 80 individuals were deployed. The findings showed that the internet and AT were used mostly for communication (32.5%), recreation (28%), and finding information (27.5%) while the use of internet for online shopping (4.5%) and banking (4.5%) purposes was severely lacking. Hence, we focused on the applicability and accessibility of haptic and audio feedback on online shopping with 3D virtual objects through JomJe. A majority (73.6%) of VI testers reported positive impressions. A trial and error approach was deployed and additional feedback from the participants was considered when working on improvements to the website. After taking into consideration participants' opinion, a multi-point haptic glove, instead of a single-point touch, was designed to maximise the use of the VI's sense of touch. In the final stage of the project, survey results demonstrated that 69.6 percent of the users found the website was convenient and 79.1 percent are willing to use it for a long term. This project provided a foundation for further research work on the use of audio-haptic system in education (e.g., Mathematics and Science). Additionally, the project team also developed a multi-point haptic glove to let the VI feel objects using their sense of touch. A majority of VI testers gave positive impressions towards the direction of development.

INTRODUCTION

Background

Visual impaired (hereafter VI) or visual disability is defined as deficits in a person's ability to perform vision-related activities of daily living. It includes blindness and low vision, specific vision dysfunctions involving functional deficits in the higher cerebral centers, and complex vision-related dysfunctions involving interactions with sensory and motor systems such as dysfunctions of visual reading ability, orientation or mobility (World Health Organisation, 2018). Various types of assistive technology have been developed to support the visually impaired for their daily tasks. Electronic devices integrated with Braille technology, navigational assistance modules, text-to-speech applications, tactile display, haptic and audio feedback etc. have become increasingly accessible and provide more opportunities to achieve better social interactions as well as quality of life for the visually impaired. Our study focused on the modelling of 3D haptic-audio virtual objects to improve the internet browsing experience of visually impaired individuals using multisensory feedback. Haptic assistive system was used to convert visual information into mechano-tactile signals, while audio-feedback was mainly for supporting non-visual navigation on the screen.

The literature review covers the usage of haptics in web browsing for VI, the use of IT and haptic technology among the VI population and how to help the community by improving web accessibility. It surveys the current gaps in haptic technology and challenges in introducing haptic tech to the VI community, which is related to the closing of the technology gap between sighted and VI people. The review also covered studies of VI using e-commerce websites.

Significance of Research

While people with fully functional abilities are able to adapt to the rapid change in technology, VI individuals often stumble in this area. In recent years, with the introduction of Assistive Technology (AT), the VI community has been able to engage more in the digital world. Recent statistics demonstrated that while awareness and use of information communication technologies (ICTs) are increasing among people with disabilities, including visually impaired individuals, the rate of adoption of ICTs among people with vision impairment is still lagging behind normally-sighted individuals (Foley & Ferri, 2012; Vicente & Lopez, 2010). This could be attributed to the lack of development in the AT field, as Castells (2001) argues that development of assistive devices lags behind mainstream computing.

On average, there will be a new development in mainstream computing every 18 months while AT rarely has any changes over few years. Thus, it is not surprising for an AT to be priced higher due to lack of development in the AT field. This study looked at internet accessibility, usability and the experience on the internet among the VI community. This is important as to the best of our knowledge, there are not many statistics on the use of internet among the VI community.

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As such, the first part of our study was exploratory and we aimed to gather sufficient data to support our latter study. In the second part of the study, we looked into the possibility of integrating haptic and audio technology into the internet. Even though VIs restricted visual abilities and heavy reliance on tactile perception is somewhat minimised with the introduction of touchscreens, VI individuals still reported having trouble in maximising the benefits of technology. Furthermore, it is also a challenge for VI individuals to navigate through websites: especially for the purpose of online shopping. There is a big technology gap between VI and sighted people and this research work aims to bridge that gap, especially for online shopping.

Research Objectives
1) to investigate whether haptic-audio 3D objects based product information using audio and haptic stimuli such as weight and texture will provide meaningful product knowledge and usability to the visually impaired.
2) to investigate whether a haptic-audio based interactive virtual environment will enable them to access information to navigate and locate products effectively.
3) to analyse the social impact of the implementation of a haptic-audio based interactive virtual environment in terms of self-efficacy and online social support.

LITERATURE REVIEW

Care of the Patient with Visual Impairment
Visual impairment can be characterised based on one's visual acuity and degree of central visual field. Visual acuity (clarity and sharpness) is measured using the Snellen chart, and a perfect vision is known as 20/20 vision. A 20/200 measurement is an example of a VI. It means that what one can see in 200 feet can only be identified by the VI individual at 20 feet. Legal blindness is defined as having vision that is 20/400 and a central visual field that is between 5 and 10 degrees (Dandona L, & Dandona R, 2006).

A visual impairment can cause disabilities by significantly interfering with one's ability to function independently, to perform daily living activities, and to travel safely through the environment (Freeman et.al., 1997). Problems that arise include loss of the ability to read standard-size print, difficulty in performing work-related tasks, and inability to recognise faces of familiar people. It is proven that when these disabilities limit personal or socioeconomic independence, a visual handicap exists (Freeman et.al., 1997). Not to mention, congenital blindness is one of the leading causes of visual impairment. Some babies have congenital blindness, which means that they are visually impaired at birth (Salvin, 2016).

Many things can cause congenital blindness, such as inheritance, infection and so on. However, there are effective interventions available to prevent and treat eye diseases. For instance,

vision rehabilitation is effective in improving functioning for people with irreversible vision impairment (World Health Organisation, 2018).

The International Classification of Diseases 11 (ICD-11) (World Health Organisation, 2018) categorises vision impairment according to its severity, which is summarised in Table 1.

Table 1: Category of vision impairment based on presenting distance visual acuity according to ICD-11.

Category	Presenting distance visual acuity
0 No vision impairment	Equal or better than 6/12
1 Mild vision impairment	Worse than 6/12
2 Moderate vision impairment	Worse than 6/8
3 Severe vision impairment	Worse than 6/60
4 Blindness	Worse than 3/60
5 Blindness	Worse than 1/60
6 Blindness	No light perception
9	Undetermined or unspecified

It is estimated that nearly 441.5 million of the world's population are visually impaired. This include 188.5 million with mild vision impairment, 217 million with moderate to severe vision impairment, and 36 million with blindness (Bourne et al., 2017). The leading causes of vision impairment are uncorrected refractive errors, cataract, age-related macular degeneration, glaucoma, diabetic retinopathy, corneal opacity, and trachoma caused by bacterial infection (Ackland, Resnikoff, & Bourne, 2017; Flaxman et al., 2017). Ackland et al. (2017) reported that 89% of visually impaired people were living in low- and middle-income countries, with Asia being the most prevalent region, having more than 62% of the people in the world with visual impairment.

The recent National Eye Survey in Malaysia (NESII) estimated the age and gender-adjusted prevalence of blindness, severe visual impairment and moderate visual impairment in the country to be 1.2 percent, 1.0 percent and 5.9 percent respectively (Chew et al., 2018). The figures have increased compared to an earlier Malaysian National Eye Survey (NES I) in 1996 which reported 0.29 percent prevalence of blindness and 2.44 percent of low vision among Malaysian population of all ages (Zainal et al., 2002). Both the surveys found that untreated cataract and retinal diseases (mainly due to diabetic retinopathy) as the leading causes of blindness, while untreated cataract and uncorrected refractive error the commonest causes of severe and moderate vision impairment in the country.

Haptic Technologies, Interfaces and Devices
Since the revolution of computer technologies a few decades ago, the interaction between human and computer has been developed with multiple interface devices. The typical computer interface devices are monitor, keyboard and mouse. This has further been enhanced with the inclusion of speaker,

joystick, webcam, touch screen, microphone, stereo headset, gaming console etc. These entire interface devices create Human Computer Interface (HCI) technologies and make use of mainly two human senses, which are auditory and visual senses. The introduction of haptic devices provides a new type of interaction that allows users to touch and manipulate virtual objects when rendering in a virtual environment.

A haptic device is defined as a bidirectional-actuated human-machine interface, in which humans interact with a device, and the interaction is displayed in a virtual environment. It has been used in areas such as medicine, research, training, education, industry, aeronautics etc. (Haptic Devices, n.d.). The device acts as a medium that provides tactile and/or force feedback when interaction between people and computer occurs. It allows people to touch, feel and manipulate 3D objects in a virtual environment and tele-operated systems. Currently, there is a haptic device, Falcon 3D joystick, ("Falcon", 2017), designed by Novint Technologies Inc, available to the public. The device can tolerate a force up to 10N, allowing a good illusion of the tactile rendering.

Access to the Internet by Visually Impaired Individuals

Over the years, technology has advanced and changed the way people live. These include software or hardware that allow people with disabilities to perform some functions which others may take for granted. For instance, there are assistive technology products that are designed to provide additional accessibility to individuals who have physical or cognitive difficulties, impairments and disabilities (Kimundu, 2019).

The most common way for the vision-impaired user to access the internet is with a traditional browser and text-to-speech software (Spratt, 2010). An example of this is Microsoft Narrator. Research says that completely blind persons mostly use screen reader software that converts the text on the computer screen into speech (Kimundu, 2019). In addition to this, assistive technology products also include refreshable braille displays that are hardware devices containing a strip of retractable braille pins, allowing braille characters to be generated on the fly (Preece, Rogers, Sharp, n.d.). However, both assistive technology products provide a linear information stream, which means that the user can only focus on one element at a time.

The internet benefits the visual impairment individuals in many ways, especially in allowing them to do numerous things on their own. Modern technology allows people with low vision to do things like write documents, browse the internet and send or receive emails (Sandy, 2015). Screen Reading software, special talking devices and Braille devices allow those of us with no vision to use computers, cell phones and other electronic devices independently (Sandy, 2015). This enables people with visual impairments to be more independent. Furthermore, another widely acknowledged benefit of the internet for people with visual impairments is the access to information to people with disabilities (Williamson, Wright, Schauder, Bow, 2001).

This emphasis reflects the broader goal of providing an "independent life". In addition to the above benefits, the internet can be particularly helpful for visually impaired people who need to use at work. For instance, there is a built-in programming language called JAWS Scripting that allows the users to program the screen reader to fit their needs (Weiner, n.d.). This can be particularly helpful for visually impaired people who need to customise the computers they use at work.

Haptic Assistive Technologies for Audition and Vision Sensory Disabilities

Haptic rendering in computer haptics calculates the force or tactile feedback to enable tangible interactions of the users with the virtual objects (Xia, 2018). Haptic assistive technology has emerged as a popular subject since the last decade, particularly in the research and development of assistive tools for the visually impaired. It has been proven to improve functional capacity of the visually impaired (Sorgini, Caliò, Carrozza, & Oddo, 2018).

One of the few ways the human brain notices the presence of physical objects in one's surroundings is by utilising the sense of touch (e.g., bumping into a table). Two primary types of haptic sensations that the human somatosensory system can detect are tactile and kinesthetic sensations. Tactile sensations are the feelings of direct contact from the skin to the physical object, whereas kinesthetic sensation is the awareness of the position and movements of the body part through the stimulation of muscles and joints (Metcalf, Merrett, Zheng & Cunningham, 2013).

In the real physical world, tactile sensations can be easily initiated when human skin encounters the physical asset; while in the virtual environment, collision between virtual assets has to be detected and simulated with a haptic device, through the inclusion of friction. Furthermore, these virtual assets would have to have deformable surfaces in order to simulate kinesthetic sensations for non-rigid physical objects, providing further information on their material in a natural manner.

The Current Gap in Haptic Technology and Challenges to the VI Community

Given the findings of these studies, the proposed study aims to implement the use of haptic-audio based product information as well as haptic-audio based interactive virtual environment in attempts to help individuals with visual impairments access information and navigate or locate products more effectively. It might also be able to improve the psychological wellbeing of the visually impaired through the improvement of their self-efficacy. This is because with the implementation of this technology, the visually impaired would be less reliant on others in accessing online information.

Similar to self-efficacy, autonomy provides individuals with the sense of self-empowerment that they are capable of doing things on their own. This has been found to be associated with

better wellbeing (Schuler, Sheldon, Prentice, & Halusic, 2016). It is highly possible then that the implementation of the proposed technology will improve the self-management of the visually impaired as they are able to use online sites with more independence, with less reliance on others (Karlsson, Arman, & Wikblad, 2008).

We also hope to translate the findings from this research into a broader context; presumably social networking system (SNS) in the future. In two recent studies conducted in Canada and UK by Gold et al. (2010) and Keil et al. (2001), it was found that 75 percent of young people with VI used internet regularly to build their social network and improve their social connections skills. The internet provides an ideal platform for people with VI to freely interact with others due to its anonymity as well as lack of face-to-face communication and real-world contact. On hindsight, this nature of online communication may provide people with VI a virtual social support in their life as the lack of physical presence promotes reduction in social inhibition, anxiety and

self-consciousness. They will thus have better confidence in initiating social interactions with online friends (Morahan-Martin and Schumacher, 2003).

They also found that lonely individuals are distinctly different from non-lonely individuals in their pattern of internet use. They often used the internet as an online social support. If applicable, we hope to explore whether the improvement in the internet user experiences using haptic technology will help individuals with VI in reconfiguring their social relationships and online identities in online spaces and subsequently provide better online social support for lonely individuals with VI.

Hence, to summarise, the implementation of haptic technology would be able to increase the self-efficacy of individuals who are visually impaired, and thus improve the psychological wellbeing of the visually impaired. Therefore, this research is essential in improving the mental health of the visually impaired.

METHODOLOGY

Research Design

The inclusion criteria for the psychology tests are as follows: (i) at least 16 year-old (ii) has visual impairment (iii) the primary home is in Malaysia, as in core family members are permanently residing in Malaysia.

The research design used in this study is website creation, prototype building, and survey method. As a result of this project, we successfully created and performed on-site testing with the visually impaired (VI) on a haptics-enabled and W3C Web Accessibility compliant e-commerce website named JomJe (link: http://jomje.homeislab.com/). The haptic technology of choice for the website was the 3D Systems Touch Stylus in conjunction with the open-source H3D API. It utilised single point haptic force feedback as its mode of operation.
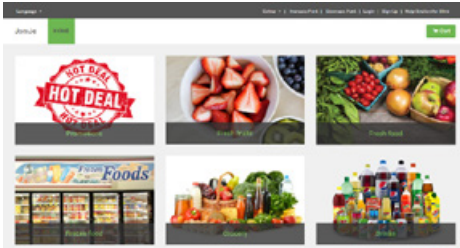
Figure 1: E-commerce website, JomJe

The Laravel PHP framework was chosen to build the website. It is faster for a developer to perform bug fixes and build feature requests if the coding of the web application is appropriately separated at the early stage of the development. Laravel has MVC software design framework that does the separation. This means Laravel enables changes to the frontend of a webpage easily without the need to interact with the backend code. In addition, Laravel helps to secure the web application by protecting it against most serious security risks such as SQL injection, cross-site request forgery, and cross-site scripting. Also, Laravel is built with testing in mind. It provides easy ways for simulating basic behaviour of users (making requests to the application and examining the output, for example, clicking links, filling out forms).

Research Instrument

The main instrument used for research was survey. This was done using online surveys (Google Forms). The 3D Touch Stylus device was used in conjunction with the JomJe website to touch and feel objects via the H3D program. Ethical clearance for the research was provided by Sunway University (Ethical Approval Number: 2018/046).

Sampling

As the population of visually impaired in Malaysia is small and scattered around in Malaysia, this field study adopted snowball sampling for recruitment of participants. We aimed for equal distribution in gender, ethnicity, age, religious affiliation, and other socio-economic variables that could otherwise potentially jeopardise the methodology and statistical power of the study. We collaborated with Sekolah Menengah Pendidikan Khas (Cacat Penglihatan) Setapak, Sekolah Menengah Pendidikan Khas Vokasional (SMPKV) Indahpura Kulai, Sabah Society for the Blind Kota Kinabalu, Sarawak Society for the Blind (Sibu Branch), Malaysia Association of the Blind (MAB), NCBM, SBM, and St. Nicholas House (Penang), to reach out to our targeted group.

The blind associations and schools helped us to identify potential participants who meet the criteria for inclusion in the study. We also asked participants who have completed the study to recommend potential visually impaired participants to us. In addition, recruitment flyers were circulated through the associations' social media platform (e.g.: Facebook) and messaging app (e.g.: WhatsApp and WeChat). The sample size of 210 individuals was pre-determined by the Principal Investigator based on the G-power analysis.

Data Collection

The data was collected using an online questionnaire. Participants were asked to complete a demographic form and a battery of questionnaires regarding their internet behaviours and online social support. Participants were allowed to pass on questions that they would rather not answer.

The whole procedure took approximately 60 minutes. All the information obtained as well as user identities were kept confidential and anonymised.

Data Analysis

The following measures were used to understand the VI individuals better: Demographics Questionnaire, Reasons for internet use, Internet Attitude Scale (Zhang, 2007), The General Self-Efficacy Scale (Jerusalem, & Schwarzer, 1992). Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet & Farley, 1988) and Loneliness Scale (Russell, 1996). The pre-testing results and post-testing results were analysed using qualitative analysis.

KEY FINDINGS

All the participants reported having minor to total impairment. None of the participants reported major medical psychiatric symptoms, major head injuries, and neurological diseases. No participants were taking neurological and psychotropic medication at the time of testing.

The final sample size of participants was 200. Figure 2 below describes the demographics of the participants that were interviewed:
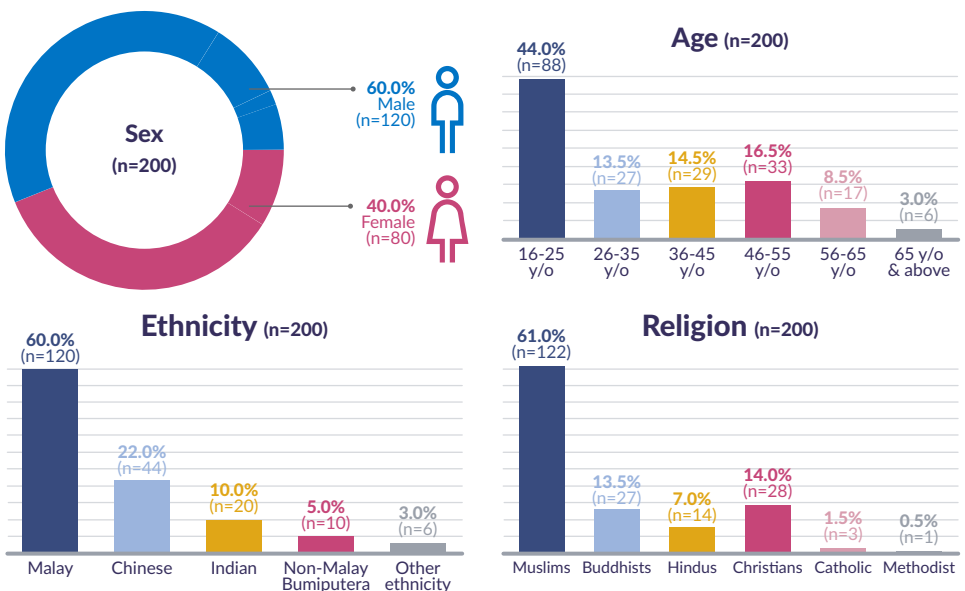
Figure 2: Demographics of the participants
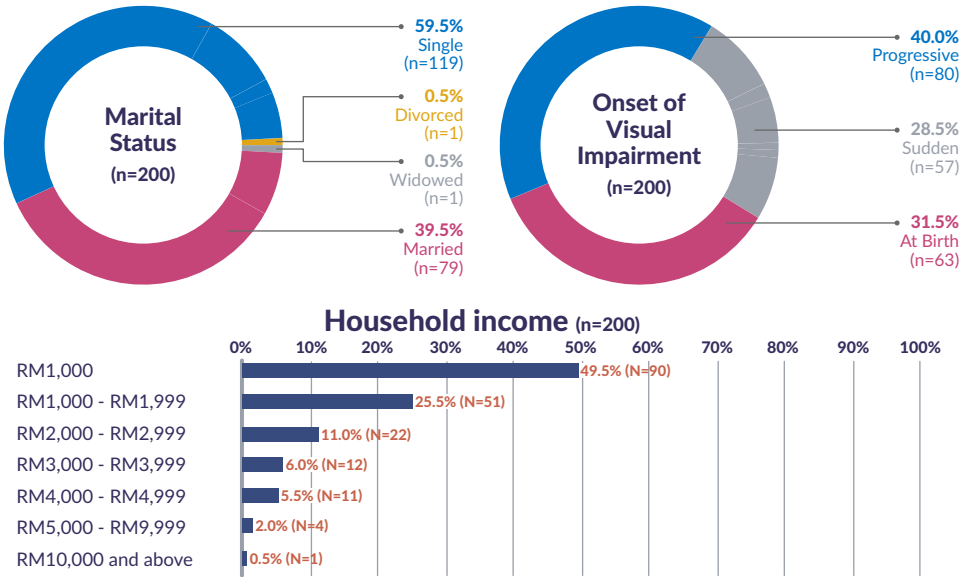
Figure 2: Demographics of the participants

Internet Usage Behaviour Among VI

From the results of our study, it is found that the participants that were surveyed in this study used the internet mostly for meeting new people (8.5%), emotional support (8.5%), talking to others who share similar interests (13%), recreation and relaxation (28%) communication with friends and family (32.5%), finding information for own use (27.5%).

| 8.5% | 8.5% | 13% | 28% | 32.5% | 27.5% |
| Meeting new people | Emotional support | Talking to others who share similar interests | Recreation & relaxation | Communication with friends and family | Finding information for own use |

Two areas that are evidently lacking in their internet usage are online shopping (60.5% never) and banking (67% never). When asked why they did not use the internet for shopping, participants cited that they prefer going to the shopping mall to touch the object instead of buying the object online, especially if the exact specifications of the object are not given. Pictures are not too useful for them as they are unable to see clearly.

60.5% NEVER DO online shopping

67% NEVER DO online banking
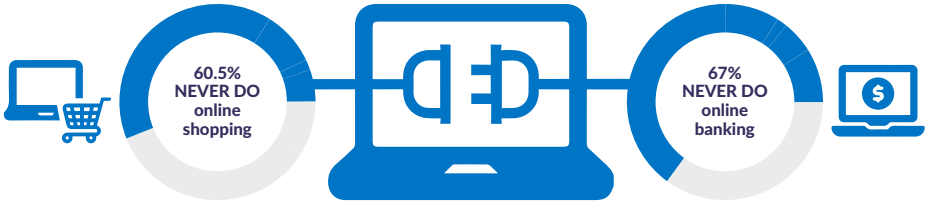
Hence, the proposed haptic device in this study would be able to contribute a positive social impact to the VI community, as it is able to counter the limitations of shopping online where one is not able to feel the object. This can increase convenience among the VI individuals as well as they would not need to deliberately navigate their way to a shopping centre just to purchase a small item. They would be able do it at home through the ease and convenience of the internet.

Relationship between Self-efficacy and Social Support

A Pearson's Correlation was used to analyse the relationship between self-efficacy and social support among the participants recruited. Contrary to expectations, there was significant relationship found, r = .244, p = .001. The results indicate that self-efficacy is related to social support provided by others, further indicating that the lack of self-efficacy as perceived by the individual is an internal issue rather than an external one. This means that the individual feels they are lacking in a particular area, even though there may be others willingly offering them help and aid all the time.

Bearing this in mind, the proposed haptic device is able to empower VI individuals in this area, by using it to assist in online shopping and internet browsing. The VI community would be able to browse the internet more independently, as well as perform more task on their own such as online shopping, without the need for help from others. This would help to promote their self-efficacy.

Post-Testing Results from the Website with Haptic Technology

Our data collection for gauging the opinions on this website is based on a questionnaire with three answers for each statement, those being AGREE, UNDECIDED, and DISAGREE. For the purpose of this report, we included statements where one of these responses obtained a simple majority (above a 50% cut-off point) over the other answers.

Tables providing statements categorised according to the dominant answer, with the strongest sentiment placed first.

Table 2: Statistics of the participants who agree

	Agree (% of total respondents)	%
1	I enjoy the time I spend using this "website with haptic technology".	79.1
2	The instructions and prompts are helpful.	75.0
3	I would recommend this "website with haptic technology" to my colleagues.	73.6
4	The organisation of the menus seems quite logical.	72.3
5	The "website with haptic technology" presents itself in a very attractive way.	69.6
6	The way that system information is presented is clear and understandable.	68.2
7	It is easy to see at a glance what the options are at each stage.	66.9
8	The speed of this "website with haptic technology" is fast enough.	66.2
9	It is relatively easy to move from one part of a task to another.	66.2
10	I can understand and act on the information provided by this "website with haptic technology".	65.5
11	It is obvious that user needs have been fully taken into consideration.	65.5
12	Working with this "website with haptic technology" is satisfying.	64.2
13	The "website with haptic technology" documentation is very informative.	63.5
14	Tasks can be performed in a straightforward manner using this "website with haptic technology".	62.8
15	I prefer to stick to the functions that I know best.	61.5
16	I feel safer if I use only a few familiar functions.	60.1
17	It is easy to make the "website with haptic technology" do exactly what you want.	59.5
18	Working with this "website with haptic technology" is mentally stimulating.	57.4
19	I sometimes wonder if I am using the right function.	54.7
20	The "website with haptic technology" has helped me overcome any problems I have had in using it.	52.0
21	I sometimes don't know what to do next with this "website with haptic technology".	50.7
22	The "website with haptic technology" allows the user to be economic with keystrokes.	50.7

Table 3: Statistics of the participants who undecided

	Agree (% of total respondents)	%
23	Error messages are not adequate.	62.2
24	Either the amount or quality of the help information varies across the system.	50.0

Table 4: Statistics of the participants who disagree

	Agree (% of total respondents)	%
25	Using this "website with haptic technology" is frustrating.	63.5
26	I think this "website with haptic technology" has sometimes given me a headache.	62.2
27	This "website with haptic technology" is really very awkward.	60.1
28	It takes too long to learn the "website with haptic technology" functions.	55.4
29	Learning how to use new functions is difficult.	54.7
30	I will never learn to use all that is offered in this "website with haptic technology".	53.4
31	It is easy to forget how to do things with this "website with haptic technology".	53.4

The major focus of JomJe is to become a template haptics-enabled website for accessibility, with e-commerce acting as the theme. As such, a broad number of statements above highlight the degree of accessibility felt by the VI participants in using the website along with its haptic features. Many of the top 16 statements which were agreed upon by the users of the website (2, 4, 6, 7, 9, 10, 11, 13, 14, 17, 20 and 22) showed that the majority of users found that the website was convenient for VI usage. This includes availability of information for website usage, systematic organisation of web page functions, and general ease of use. In addition, statements 26, 27, 28, 29 and 30 which were generally disagreed upon by most users further stressed upon the simplicity and straightforwardness of usage, with easy-to-learn and memorable functions providing direct access to the desired function within the website.

However, a large number of users also found the website to be mentally stimulating (18), were unsure whether they were using the right function (19), and found themselves at a loss as to how to proceed (21). This proves that optimal accessibility has not been achieved by JomJe, with the ideal scenario being one that provides no challenge or confusion whatsoever to the user in accomplishing their intentions. One explanation would be the fact that the VI community at present has had little to no experience in engaging with e-commerce, with some mentioning distrust of e-commerce due to fear of manipulation leading to said aversion.

Aside from accessibility, the website was also trialed for its ability to engage its users and encourage repeated usage. To this end, statements 1, 3, 5, and 12 elicited a positive response by most users, rating it as "enjoyable", "attractive" and "satisfying". They also would recommend it to their colleagues. More telling is the fact that the most disagreed upon statements (24 and 25) ensure a painless experience when using the website, despite the aforementioned confusion. It would be cautiously optimistic to say that JomJe is a reliable template website for engagement purposes using haptic technology, especially with respect to the VI community.

As for the rest of the statements that are yet to be mentioned, it would appear that many users find comfort in using a few familiar functions (15 and 16). This suggest that future extensions of VI-friendly websites should incorporate as few functions as possible to improve VI user experience. Statement 8 affirms that the website functions smoothly in terms of speed, while statement 23 was mostly inconclusive as there was a lack of instances where errors occurred in the website operations. Statements outside the questionnaire show that many users find haptics an interesting novelty for a VI-adapted website, suggesting that haptics is a good technology in engaging the VI for repeat usage. There was feedback given for improvement of said haptic technology quality for website design. Many also reaffirm the importance of developing a multilingual interface given the multiracial makeup of Malaysia.

RECOMMENDATIONS

Given this information, the recommendation for future applications of haptics technology in online usage would be to develop a website that focuses on communication between friends and family for maximised impact within the VI community. When attempting to improve online accessibility to the Malaysian VI community, the lessons learned from the largely young and up-and-coming generation are as follows:

- JomJe provides a template for use of haptics for improving VI accessibility and engagement.
- Haptic technology implementation in websites attracts the VI to use online applications.
- Educating the VI on the concept of how e-commerce – or websites, in general – functions, as well as online safety instructions will provide more clarity and confidence in online usage.
- It is recommended that future haptics-enabled websites implement multilingual interfaces with a minimal number of functions and with further improvement of haptic display quality.
- Direct interviews with the VI community reveal the importance accorded by them for the development of websites with haptic technology.
- The next recommended aspect of the internet that could improve accessibility for the VI community through the application of haptic technology appears to be social communication applications between friends and family.

CONCLUSION

It is undeniable that based on the current survey of internet knowledge and usage, the implementation of haptic technology for internet browsing and online shopping would be more effective in Peninsula Malaysia rather than Sabah and Sarawak due to the former being more technology savvy. In relation to this point, it was also observed that VI participants were sometimes reluctant to participate in the study, citing reasons like, "It won't make a difference", "We've been like that for so long, but nothing has been done to help us", etc. This could reflect a lack of trust between the VI community and potential organisations that might want to offer help to them. This is an important issue to address by future researchers, organisations, as well as funding bodies.

Following the findings of this study, we recommend a new method to design websites for VI people. Websites with 3D objects have the potential to improve the VI users' access to online shopping. In addition, new types of interface and device have been developed to enhance the

browsing experience for VI in online shopping. The haptic glove requires more improvement before it becomes suitable for commercial usage. Initial usage of the glove has shown that although it is able to form the shape of the object, there is room for improvement in terms of the software.

The study has indicated that there is an improvement in the interaction from the IT and psychology aspects. After further iterations are built using the findings of this study as well as the feedback obtained, we recommend that a deployment-ready improved version of JomJe be made available so that the VI benefit in the transactions segment of the internet.

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ICT Adoption and Its Impact on Cultural Preservation
Amongst the Native People
of Sabah

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ABSTRACT

This paper is about Information and Communication Technology (ICT) Adoption and its impact on cultural preservation amongst the native people of Sabah. Culture represents the beliefs, practices and artifacts of a group. In many instances, studies had indicated that ICT development had influenced or undermine the culture of the society. However, culture and development have to interact with one another in order to ensure the survival of humans. The objectives of this study were (i) to determine the level of ICT adoption (ii) to determine the factors that encourage and hinder ICT adoption and (iii) to determine the impact of ICT on cultural preservation among the native communities in Sabah. A quantitative approach was employed in this study. A survey was conducted among 1,300 natives of Sabah from the Kadazandusun, Bajau, Murut, Kedayan, Lundayeh, Melayu Brunei, Rungus, and Suluk. The data was analysed using descriptive and regression analysis. The findings showed that the native communities adopted well to modern ICT tools and are willing to try out new technologies. Majority of the respondents possess moderate ICT skills with 3-6 hours of time spent. Among the four factors that were measured, all the factors showed p-value of <0.05 which indicated all the factors are significantly contributing to the impacts on cultural preservation. In terms of strength of influence, effort expectancy with the beta value of 0.295 showed the strongest influence among the other factors. On the other hand, facilitating conditions showed the weakest influence. The percentage mean score of all cultural elements showed that the respondents were agreeable to the impacts of ICT cultural preservation.

INTRODUCTION

The Geneva Declaration of the Global Forum of Indigenous Peoples and Information Society states that:

"Information and Communication Technology (ICT) should be used to support and encourage cultural diversity and to preserve and promote the language, distinct identities and traditional knowledge of indigenous people, nations and tribes in manner which they determine best advances these goals."

Culture represents the beliefs, practices and artifacts of a group. Often studies have labeled Information and Communication Technology (ICT) as a cultural erosion catalyst. As mentioned by Mustafa (2006), the world is facing an identity crisis as we live in the globalisation era in which identity construction has become increasingly complicated due to rapid innovations of ICT. However, the fact remains that with ICT advancement, the community can benefit in terms of learning about different cultures while at the same time, promoting and preserving their own culture.

The determination of the government in developing digital community can be seen clearly as ICT development programmes are significantly highlighted in each Malaysia Plan. To date, MCMC has set up 364 Community Wi-Fi and 111 Internet Centers in Sabah (MyComms Website).

However, how effective is the implementation of ICT development in Sabah? Are the native people of Sabah accepting the ICT development programmes that have been implemented by the government? What are the factors that promote or inhibit the development and provision of ICT to the native communities in Sabah? To what extent does the adoption of ICT affect the sustainability of native cultures in Sabah? All of these are very important issues to be discussed in the context of the government's efforts to build digital communities in Malaysia.

This study aimed (i) to determine the level of ICT adoption (ii) to determine the factors that encourage and hinders the ICT adoption and (iii) to determine the impact of ICT on the cultural preservation among the native communities in Sabah.

LITERATURE REVIEW

Native Communities in Sabah

Malaysia is a developing country that has adopted a parliamentary democracy system in concurrence with goals of integration among the diversified ethnic groups in the country. This diversified nation is built up of the Malays, Chinese, Indians, Orang Asli (the native communities), Sikh, Siamese and other ethnic groups in Peninsular Malaysia while the Iban, Bidayuh, Kadazan, Dusun, Sama-Bajau and other Bumiputera tribal communities reside in small numbers in Sarawak and Sabah (Abdul Rahman, 2003).

According to the 2015 census, the total population of Sabah is 3,543,500. The natives of Sabah made up 1,781,112 of the state's total population. These native communities included KadazanDusun, Bajau, Murut, Rungus, Kedayan, Lundayeh, Melayu Brunei, Suluk and so forth.

Table 1: Sabah's Population Ethnicity

Ethnicity	Total ('000)	%
KadazanDusun	568.7	17.5
Bajau	450.2	13.8
Murut	102.5	3.1
Other Natives	655.1	20.1
Chinese	295.7	9.1
Malay	224.0	6.9
Indian	9.5	0.2
Others	100.7	3.1
Non-Malaysian Citizens	853.6	26.2
Total	3,260.0	100.0

Source: Department of Statistics Malaysia (2010)

Conceptual Framework

There is a lack of expansion and integration of Unified Theory of Acceptance and Use of Technology (UTAUT) model in other contexts especially in the cultural context. Similarly, there have been several models introduced in studies related to information system, technology and also psychological behaviours of the users, but none of the studies have taken cultural perspectives into consideration. For example, Theory Acceptance Model (TAM) is focused on information system context and the Theory of Planned Behaviour is a general model to study about human behaviour. Following the existence of various models, Vankatesh et al. (2003) introduced UTAUT which provides a refined view of how determinants of intention and behaviour evolve over time. This model is a definitive model which serves as a foundation to guide research related to technology.

In this study, the UTAUT model has been studied, adopted and modified by the researcher to suit the cultural preservation context of this study. The theory identifies four key factors, namely performance expectancy, effort expectancy, social influence, and facilitating conditions; as well as four moderators (i.e. age, gender, experience, and voluntariness) related to predicting behavioural intention to use a technology and actual technology use (Venkatesh et al., 2003). This theory had been adopted in numerous studies to illustrate the factors influencing the adoption process of a system or innovation.

Figure 1: Modified, Unified Theory of Acceptance and Use of Technology (UTAUT)
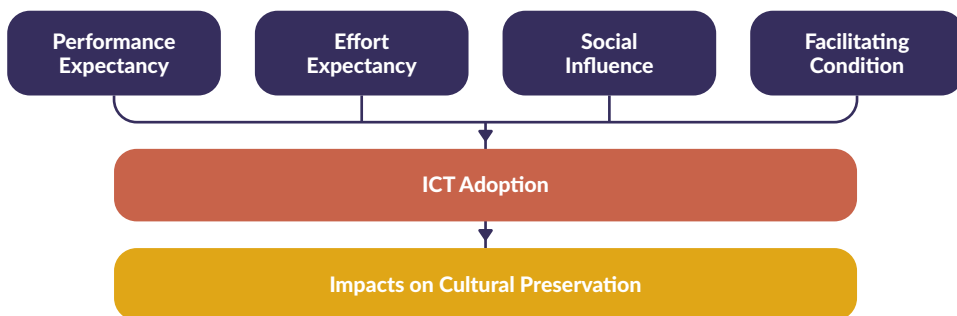
(Source: Adopted from Vankatesh et al., 2003)

The conceptual framework of the present research was developed and modified based on elements discussed in UTAUT. The theory emphasises the internal and external factors that influence adoption of innovation to achieve a desired outcome.

Performance expectancy construct is defined as the degree to which an individual believes that using the system will help him or her to attain gains in job performance. In this study, performance expectancy was measured for the native community in Sabah in its adoption of ICT towards cultural preservation. Key words like enhances, facilitates, saves times, and useful in finding information, learning about culture were used to construct the five items of the construct.

Effort expectancy construct is defined as the degree of ease associated with the use of the system. This measured the adoption of ICT by the native community on learning, promoting, sharing and preserving their culture. Social influence construct is defined as the degree to which an individual perceives how important others believe he or she should use a new system. In this study, social system of an individual such as family, relatives, friends, community, government and religion are used to construct the items of the construct which influence the individual to adopt ICT for cultural preservation.

The last construct, facilitating conditions are defined as the degree to which an individual believes that an organisational and technical infrastructure exists to support use of the system. Financial resource, accessibility to ICT tools, time allocation, skills and facilities are the elements used to construct the items.

As shown in Figure 1, ICT adoption is the independent variable while the impacts on cultural preservation is the dependent variable of the present research. Meanwhile, the researcher also considered it essential to determine the relationship of other components which might influence ICT adoption as proposed by UTAUT theory.

ICT and Cultural Preservation

The process of development always correlates not only with the modernisation of a state, but also involves and influences the cultures of the society. A society describes a group of people who share a common territory and culture. Culture can be defined as the beliefs, practices and artifacts of a group. King (1993) perceives that so-called traditional culture was not necessarily an obstacle to change, nor would it simply succumb to modernity. These changes could be performed in such a manner as to facilitate the modernisation process and to accommodate other values and practices. The older generations perhaps still preserve and practice traditional culture, but this is not reflected among the younger generations, especially the millennium generation. With the advancement of technology, culture no longer remains as traditional as earlier years; it has experienced radical changes.

During the olden days, cultural values and norms used to be taught through verbal education and through specific practices between the elder and the younger generation. Today, people regardless of their social background and age groups can easily access the internet and learn about cultures of their own community and that of others as well. Cultural information sharing is made available by the community themselves, as they proudly share about their own culture, and thus indirectly promote their community culture.

A research by Khan, Zainab, Rizvi, and Khan (2015) claimed that digitisation assistance can help in preserving precious materials and cultural artifacts. Furthermore, a research conducted by Sarjit et al. (2012) which focused on six ethnic minorities in Peninsular Malaysia, found that ethnic minorities view ICT as an important tool in sustaining their cultural identity. In tandem with this research, it is also important to pursue follow-up studies on how ICT impacts the cultural preservation of native communities in Sabah. A research conducted by Ott & Pozzi (2011) suggested that the introduction of ICT as cultural heritage learning tools has not only provided a multidisciplinary approach on learning culture, but also a cultural sharing far beyond national and regional boundaries, providing a significant added value to civics.

Recently, a research by Machidon, Duguleana & Carrozzino (2018) on cultural heritage show that Virtual Reality applications technically improve human interaction and engagement by giving new breath to learning about cultural heritage. It evidently supports the view that technology has brought about a new paradigm in learning about one's cultural heritage. The impact is not only in the virtual world. Human interaction in the real world are also enhanced through such technology.

Sabah, one of the states in Malaysia which is rich in natural and human resources, with its diverse multi-ethnic communities, is facing the threat of language extinction due to migration, attitudinal, educational, social and economic factors (Ali, 2010). However, to date no research has focused on the impacts of ICT towards cultural preservation.

METHODOLOGY

This study employed a quantitative approach. A self-administered questionnaire based on the research objectives was developed. A set of questions was also prepared for the Focus Group Discussion (FGD) in order to get more information on current issues from community leaders as well, which can then be used to enrich the analysis in the later stages.

This research, which focuses on ICT adoption among native communities, was conducted in Sabah. A total of 1,300 respondents were selected. The population of this research are from eight selected native communities namely, KadazanDusun, Bajau, Murut, Rungus, Kedayan, Lundayeh, Melayu Brunei and Suluk in Sabah who have already had experience in using the selected ICT such as computers, laptops, tablets or smartphones.

Three different analysis tests were carried out. , We started by carrying out the FGDs on the impact of ICT adoption on cultural preservation. This was followed by first, descriptive analysis used to describe data on demographic background, quantifying the mean and percentage of the factors of ICT adoption and its impacts on cultural preservation. Second, factor analysis was carried out to reduce a large number of variables into fewer number of factors, by extracting maximum common variance from all variables and putting them into a common score. All the items in the four constructs (Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions) were analysed and similar variables were grouped into dimension. Third, the regression analysis was used to identify the factors that encourage and hinder the adoption of ICT.

FINDINGS

i. Demographics of Respondents

Table 2: Frequency Distributions of Demographics of Respondents

Variables			Frequency (n=1,300)	Percentage (%)
Gender	Male		654	50.3
	Female		646	49.7
Age Group	Youth	18-40	650	50.0
	Late Adulthood	41-60	390	30.0
	Elderly	>60	260	20.0
Ethnic	Bajau		270	20.8
	Kadazandusun		350	26.9
	Kedayan		100	7.7
	Lundayeh		90	6.9

Variables		Frequency (n=1,300)	Percentage (%)
Ethnic	Melayu Brunei	120	9.2
	Murut	150	11.5
	Rungus	120	9.2
	Suluk	100	7.7
Religion	Bahaism	1	0.1
	Buddhism	4	0.3
	Hinduism	2	0.2
	Islam	816	62.8
	Christianity	469	36.1
	Paganism	7	0.5
	Sikhism	1	0.1
Marital Status	Single	430	33.1
	Married	781	60.1
	Widower/Divorced	89	6.8
Highest Education Level	No formal education	171	13.2
	Primary school	173	13.3
	Secondary school	545	41.9
	Certificate	129	9.9
	Diploma	123	9.5
	Bachelor Degree	145	11.2
	Masters/PhD	14	1.1
Occupation	Government Sector	144	11.1
	Private Sector	259	19.9
	Self-employed	441	33.9
	Unemployed	306	23.5
	Retired	33	2.5
	Student	117	9.0
Average Monthly Income (RM)	0-1000	667	51.3
	1001-2000	147	11.3
	2001-3000	61	4.7
	3001-4000	16	1.2
	4001-5000	23	1.8
	5001-6000	12	0.9
	6001-7000	5	0.4
	7001-8000	2	0.2
	Not revealed	367	28.2

The number of male and female respondents were almost equivalent. The respondents were categorised into three age groups, namely youth, late adulthood and elderly, comprising 50 percent, 30 percent and 20 percent respectively. The following findings were discussed based on these categories of youth, women and elderly groups.

The researchers had fixed the number of respondents from each ethnic groups according to the populations in Sabah where the majority of them are Kadazandusun, followed by Bajau, Murut, Melayu Brunei, Rungus, Kedayan, Suluk, and Lundayeh. The majority of respondents were Muslim (62.8%), followed by Christians (36.1%).

The majority of respondents were married (60.1%). Only a small percentage (6.8%) are widowed or divorced. 41.9 percent of respondents completed their secondary school education, followed by 13.3 percent at primary school level, while 13.2 percent of them had not attended school. Only a small number of the respondents (21.8%) managed to pursue their education to tertiary level.

Based on the level of education, 33.9 percent of respondents are self-employed, with a large segment of them being farmers and fishermen. 51.3 percent of respondents earn an average monthly income below RM1000 while 28.2 percent of respondents did not reveal their income, probably because they prefer not to disclose it, while some of the respondents were students.

ii. ICT Adoption

The adoption of ICT tools among the respondents was positive in terms of conventional ICT tools, especially in usage of handphones. The majority of respondents owned and used handphones (95.5% and 96.7% respectively), indicating that the native people are well adoptive and receptive towards ICT. From this large percentage of handphone ownership, most of the respondents who owned smartphones are from the youth groups, while the elderly groups only prefer to use feature phones. Other modern gadgets like computers, laptops and tablets are not very much favoured by the respondents.

Television still remains a favourable conventional ICT tool for respondents, with 94.8 percent ownership and 93.5 percent of the respondents using it. Television would still be considered one of the most convenient tools especially for elderly citizens.

In terms of average duration of daily ICT usage, handphone usage scores the longest usage duration, followed by internet usage and television. The average daily use of handphone was about three hours but less than six hours. Another research by Go-globe (2015) also showed that Malaysians spend an average of 3.3 hours on social media each day and it is third highest in the region. This confirms that the daily usage of ICT of the native people in Sabah is in line with the mainstream community in Malaysia. Besides, the skill of respondents in operating ICT tools was moderate especially for handphone and television.

The number of respondents using the internet was rather high (78.4%), which indicates that the internet penetration in Sabah is good and accessible. Though 78.4 percent of respondents claimed to have access to internet, the efficiency of the internet is still questionable. Based on the findings from the FGD, the community claimed that they often experience interruption in not only internet connection, but also on fixed line communications.

"Di bahagian sepulut, kampung Lontong dekat dengan sekolah. Kampung tanpa wayar ada satu. Kalau ada hujan kuat, tidak bagus sudah, dan satu dua bulan baru dia ok. Dia ok dalam dua tiga minggu tu ok, lepas tu tidak ok, tiga empat bulan."
(Murut informant, female, 27 years old)

Translation:
"Over at Sepulut, Kampung Lontong, near the school, there is a village without wired (connection). When there is heavy rain, it doesn't work, and only after one or two months, it's OK. It's OK for about two or three weeks, after that it's not OK, then for about 3 or 4 months, it's not OK."

"Kalau area pekan rasanya ok, kalau di pedalaman, internet memang tidak dapat. Macam kampung penampang, kampung lompati... sana memang ada sekolah Cuma sekolah rendah, tapi kalau line telefon, kalau guna telefon canggih, memang tiada line. Macam family saya, guna telefon lama2 tu."
(Rungus youth informant, female, 24 years old)

Translation:
"If it's town area, I feel it's OK, if in the interior, then of course we can't get it. Like Kampung Penampang, Kampung Lompati... there are schools, only primary schools, but as for telephone lines, if you use latest phones, there is definitely no line. As for my family, we use the olden phones."

On top of that, there was also feedback from the elderly informants who received 1Malaysia netbooks from the government, but were not given any training to use the gadgets. In the end, many sold the laptops to get some money as they did not know how to utilise it.

> *"Hari itu kerajaan ada bagi computer 1 Malaysia...setiap kampung-kampung
> itu dapat...tetapi di dalam pembahagian computer yang dapat tu orang tua...
> kenapa bagi pada orang tua kenapa bukan bagi orang muda...kalau bagi saja
> begitu, ada yang simpan ada yang jual balik kerana tidak faham kan...itu sangat
> mengecewakan...tiada tindakan susulan...hantarlah tenaga pengajar...bagi latihan..."*
> **(Murut elderly informat, male, 58 years old)**

Translation:
"The government provided us with 1 Malaysia computers ... each village gets them .... but in
terms of allocation, those who get it are the elderly ones ... why is it that it is given to older
people and not given to younger ones ...If it is given just like that, there are those who keep them,
there are some who sell them off as they don't understand about it ...this is very disappointing
... there is no follow-up action ... please send teaching personnel ...to give training..."

Additionally, the native community were also most receptive to learning new technologies.

Among the social media platforms, WhatsApp was the most popular platform used by the
respondents, with 79.5 percent and 79.9 percent respectively. Facebook was the second most
popular among the respondents, with 73.5 percent using it, followed by 69.3 percent and 58.6
percent of the respondents using YouTube and email respectively. The average daily use of
WhatsApp was about three hours but less than six hours. Additionally, the skills for operating
WhatsApp, Facebook, YouTube and email were above basic skills level. In contrast, social media
apps like Twitter, Line and Snapchat were least in favour by the respondents. Respondents
reporting the use of other social media platforms amounted to 10.3 percent. These include
social media platforms like Telegram, Samsung apps and other gaming apps (Mobile Legends,
Candy Crush).

The results were in parallel with a research released by MCMC (2017) in an internet users
survey. It was reported that there were about 21.9 million social media users as of 2016.
Majority of the users (97.3%) claimed to own a Facebook account. On top of that, most of the
internet users prefer to use internet for texting via over-the-top (OTT) messaging platform, as
these platforms connect them to their friends and acquaintances without restrictions of any
geographical boundaries, besides the obvious convenience of using it.

From this research, the researchers also discovered that the native communities also utilise
social media platforms to promote their ethnic cultural festival by uploading videos of their
celebrations.

"Contohnya perayaan magahau rungus diadakan, jadi untuk memudahkan cara, kita just upload bila pesta tu diadakan, apa pertandingan dipertandingkan...setiap zon ada pesta ini, jadi dengan ICT ini, dia senang diviralkan, WhatsApp ke telegram ke, jadi kita tahu informasi di situ. Tapi datang tu tidak berapa, sebab tidak secara lisan kan bercakap..." **(Rungus informant, female, 22 years old)**

Translation:
"For instance, the Rungus Mahagau festival is held, so to make it easier, we just upload when this festival is held, what competitions are held... every zone has this festival, so with ICT, it's easy to viral, either with WhatsApp or Telegram, so we know the information is there. But those who actually attend are not that many, because it's not informed verbally..."

From the profile of ICT adoption above, we accumulated the score of the ownership, time spent and skills of the respondents to determine their level of ICT adoption. Most of the native communities are early adopters (49.1%) and intermediates (47.2%). The early adopters were ranked accordingly in respective to the ethnic groups, from descending manner: Rungus, Lundayeh, Suluk, Kedayan, Bajau, Murut, Melayu Brunei and Kadazandusun. Refer to Figure 2 below.

Level of ICT Adoption by Ethnic Groups

Variables	Early Adopter	Intermediate	Advance
■ Bajau	46.3	49.3	4.4
■ Kadazan Dusun	41.4	53.4	5.1
■ Kedayan	59.0	41.0	0
■ Lundayeh	62.2	34.4	3.3
■ Melayu Brunei	42.5	50.8	6.7
■ Murut	43.3	54.0	2.7
■ Rungus	64.2	34.2	1.7
■ Suluk	60.0	38.0	2.0
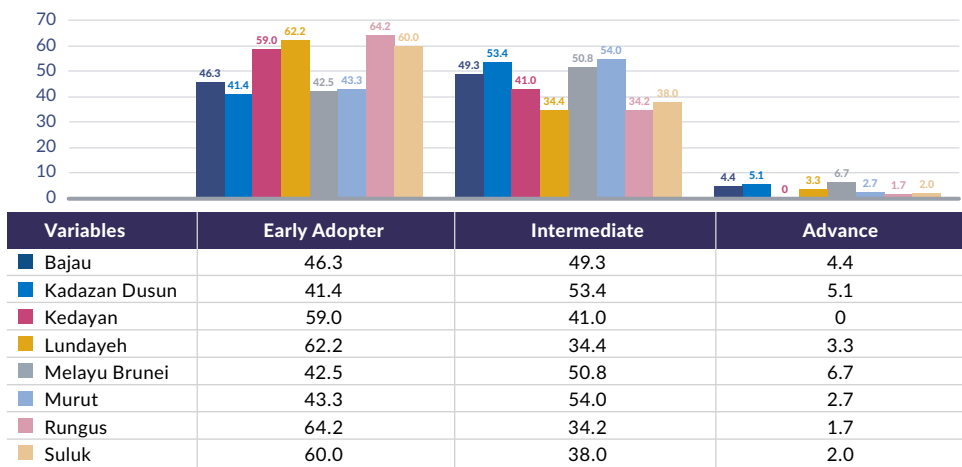
Figure 2: Level of ICT Adoption by Ethnic Groups

iii. The Impacts of ICT Adoption Towards Cultural Preservation

There were seven elements of cultural identity used to measure the impacts of ICT adoption on cultural preservation namely: language, beliefs and rituals, traditional dress, ethnic festival, traditional food, arts, and traditional medicine. In this section, the researchers compared the total mean, and the mean across each of the items. Likert scale of 1 to 5 was used to measure the level of agreeability of the respondents towards the impacts of ICT on the seven elements of cultural identity.

The following ranks the percentage mean score for the seven elements used to measure the impact of ICT on cultural preservation.

Table 4: Mean Scores of Impact Elements

Elements	Mean Score (%)
Impacts on Arts	75.8
Impacts on Ethnic Festival	74.6
Impacts on Traditional Dress	74.4
Impacts on Language Preservation	74.0
Impacts on Traditional Food	73.6
Impacts on Traditional Medicine	71.8
Impacts on Beliefs and Rituals	70.2

Among the seven elements measured, the impacts on arts showed the highest percentage mean score (75.8%) while the impacts on beliefs and rituals showed the lowest percentage mean score (70.2%). However, the impacts on beliefs and rituals scored the lowest mean; this could possibly be because the respondents were very protective of their own native knowledge and were reluctant to share with others. Nevertheless, the percentage mean score across the elements did not show much significant difference. The percentage mean score of all the elements showed that the respondents were agreeable to the impacts on ICT cultural preservation.

Below are some FGD data which supports the finding that native communities adopt ICT in promoting, learning, sharing and preserving their culture.

Based on the FGD data, one of the Rungus informants claimed that social media which promotes features of their ethnic community indeed teaches and promotes the native language among the younger generation, and encourages the participation of the elderly groups.

"Ada satu page momogun rungus komuniti, mereka tanya istilah haiwan dalam tu dalam bahasa rungus tu apa...contoh...sebab sana generasi muda dengan generasi yang tua bolehlah berkomunikasi melalui komen-komen di situ. Jadi yang muda dapat menimba ilmu dari situ."
(Rungus informant, female, 22 years old)

Translation:
"There's a Momogun Rungus community page where they ask for names of animals in the Rungus language ... for example ... there the young and older generations can communicate by means of comments there. And the younger ones can obtain knowledge from there."

Also, the adoption of ICT with social media platforms provide the community with the medium to share about their own culture including traditional clothes, rituals and other cultural aspects. The sharing of the cultural knowledge not only promotes their own culture, but also gives an impressive realistic experience through Live mode in Facebook. The dissemination of cultural information can be circulated very quickly and conveniently.

"Kalau terlupa...kita juga refer balik internet...di Facebook juga boleh tengok Persatuan Bajau ada pasal budaya, pakaian semua...ada yang berbincang menggunakan medium bahasa Bajau...tanya tentang aktiviti...ada yang hantar Facebook live saya boleh la menikmati pengalaman budaya...seolah-olah di depan..."
(Bajau informant, male, 53 years old)

Translation:
"If we forget … we can refer back to the Internet … the Bajau society can be seen in Facebook talking about cultural matters, clothes … there are those who discuss using the medium of Bajau language … asking about activities … some have sent me Facebook live feeds so I can enjoy cultural experiences … almost as if it's right in front of you …"

"Saya pergi siaran Orang Kidat...perkahwinan Tinauk...itu budaya Murut... daripada sana saya promosi...saya hantar gambar, mudah dan laju..."
(Murut informant, male, 58 years old)

Translation:
"I visited the Kidat people … Tinauk wedding … that's Murut culture … from there I promote … I send pictures, it's convenient and fast …"

"Promosi sekarang banyak...YouTube...kita kasi upload tarian kita...cerita-cerita pendek kebudayaan, cara hidup...juga nyanyian...itu semua kami sudahmembuat promosi melalui CD, internet, YouTube, dan sebagainya...dari segi pakaian... Facebook, website...persatuan juga mempromosikan juga...maklumat itu dapat disebarkan kepada semua orang...selain itu tentang bahasa...daripada internet... yang tak faham istilah-istilah tertentu boleh tanya di Facebook dan Whataaps... kalau dulu terpaksalah balik kampung tanya orang tua apa ertinya... ada kawan yang upload tentang pakaian..."
(Rungus informant, male, 57 years old).

Translation:
'There are lots of promotions now ... Youtube ... we upload our dances ...short accounts of our culture ... our ways of life ... our singing too ... all of these we have promoted through CDs, Internet, Youtube etc ... in terms of clothing ...Facebook, websites... there are organizations promoting as well ... this information can be spread to everone ... besides that, regarding language ...from Internet ...that which we don't understand, we can find out from Facebook and Whatsapp ... in those days, you have to return to your hometown and ask the elders for the meaning ... there are friends who upload things about clothes ..."

The advantage of social media platforms is that they help to educate other ethnic groups on the native community's culture. This platform will intrigue the younger generations to be more interested in learning about their own culture through visual and audio gateways, besides learning from the elderly generations.

"Ada juga. Contoh, melalui facebook, gambar perempuan memakai full attire pakaian rungus, dia Nampak 'oh, macam ini pakai ya, ada ini pula'. Itu bangsa-bangsa saya, kalau kawan-kawan saya di semenanjung pun tanya, 'begini ka pakaian kamu' . jadi melalui facebook caption tu, automatic orang lain pun boleh tahu, dapat belajar juga."
(Rungus informant, female, 22 years old)

Translation:
"Yes, there is. For example through Facebook, when people see pictures of ladies wearing full Rungus attire, they will see, 'Oh, this is how you wear it, and there is this thing too!' These are people from my race, while my friends from Peninsular Malaysia would ask, 'So this is how your dressing is.' So through Facebook captions, automatically others can know, and can learn too."

"Selalunya ada juga, anak saya. Macam anak perempuan saya, saya bawa baju pengantin perempuan, saya tunjukkan, jadi dia pun selalu search pakaian-pakaian tu, apa jenis aksesori itu.. jadi pembelajaran tu ada dua la, melalui live dan juga ICT."
(Melayu Brunei informant, female, 53 years old)

Translation:
" Usually happens, for my child. For example, for my daughter, I bring her bridal attire, I show her, and she searches for these costumes, what type of accessories ... so there are two forms of learning, that is through live learning and through ICT."

Nevertheless, there were certain groups within the community especially the elderly groups who still practice giving out wedding invitations personally from house to house. By this action, they feel they are upholding the value system of the community, and believe it is more appropriate and sincere when inviting guests to celebrate a joyous occasion of the family.

"Kalau komuniti bajau kan, kad jemputan masih ada untuk tiga pupu atau empat pupu. Kalau dalam keluarga sendiri, kad jemputan tidak dipakai. Ibu bapa sendiri yang akan pergi setiap rumah bagitau. Kalau dibagitau melalui WhatsApp ke, dia orang tidak akan datang, dianggap tu satu penghinaan."
(Bajau informant, female, 27 years old)

Translation:
"If it's the Bajau community, invitation cards are still there for third or fourth cousins. If within own family, invitation cards are not used. The parents themselves would go to each house and inform. If informed through Whatsapp for example, they will not attend, it's considered a humiliation."

Furthermore, one of the informants also expressed a reaction towards any wrong articulation and interpretation of their culture. This showed that native communities are still very protective of their own culture.

"Saya akan komen…pernah berlaku dalam satu article tentang adat Murut… tapi tidak benar…kami akan cari sampai siapa penulis…lepas tu sogit…"
(Murut informant, male, 58 years old)

Translation:
"I will comment … it has happened in one article about Murut customs … but it was incorrect … we would find the writer … and then impose a fine on them".

Overall, ICT adoption brings about positive impact on the cultural preservation among the native people in Sabah. They had benefitted by promoting, educating, learning and sharing their indigenous knowledge not only among their own ethnic group but also to others. ICT has provided a different learning and sharing platform for cultural preservation. Nevertheless, the elderly groups are still practising and prefer the conventional ways of inviting friends and relatives to wedding ceremonies. Although ICT platforms widely promote their own cultures, the native groups were aware and concerned about any wrong articulation and interpretation of their culture.

iv. ICT Adoption Factors and Impacts on Cultural Preservation

The purpose of this section is to indicate the strength of influence of ICT adoption factors towards the impact on cultural preservation. Descriptive analysis was used to determine each level of influencing factors, followed then by regression analysis to test the strength of relationship between ICT adoption factors and impact on cultural preservation.

The factors of ICT adoption consist of four variables, namely the performance expectancy, effort expectancy, social influence and facilitating conditions. Likert scale of 1 to 5 was used to measure the level of agreement of the respondents towards the factors. Mean score between 1 to 2 is considered as low, while 3 is considered as moderate, and 4 to 5 is considered high level of influence on adoption of ICT. Among the four factors measured, the highest mean score of influencing factor is performance expectancy, followed by effort expectancy, social influence and then, facilitating conditions.

In conclusion, among the factors influencing the adoption of ICT, facilitating conditions scored the lowest mean score. Thus, to improve ICT adoption, facilitating conditions such as finance, ICT tools, skills, time and facilities provided need to be improved.

Table 4: Mean Scores of Factors Influencing ICT Adoption

Factors	Mean Score
Performance Expectancy	3.93
Effort Expectancy	3.87
Social Influence	3.46
Facilitating Conditions	3.11

v. Analysis of Influencing Factors and Cultural Preservation

The strength of relationship between the influencing factors and impact on culture preservation is shown below by the regression analysis.

Table 5: Relationship of factors and Cultural Preservation

Model	Unstandardised Coefficients		Unstandardised Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	41.447	4.931		8.405	.000		
total_performance	1.672	.295	.176	5.665	.000	.391	2.557
total_effort	3.567	.399	.295	8.931	.000	.346	2.894
total_SI	2.347	.207	.267	11.343	.000	.679	1.472
total_FC	1.666	.239	.152	6.966	.000	.795	1.258

a. Dependent Variable: total_kesan

From the four independent variables measured, all the factors showed p-value < 0.05, which indicates all the factors are significantly contributing to the impacts on cultural preservation. In terms of strength of influence; effort expectancy with beta value of 0.295 showed the strongest influence among the factors. Nevertheless, the difference in strength of influence among the four factors does not show much significant difference.

Table 6: Strength of Relationship between Factors and ICT

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.715[a]	.511	.510	28.330

a. Predictors: (Constant), total_FC, total_SI, total_performance, total_effort

R denotes the correlation between the four factors (independent variables) and impact on cultural preservation (dependent variables). In our case, Adjusted R Square = 0.510, which indicates that the independent variables predict the dependent variable at only 51 percent. The regression analysis suggests that although the government has provided all the facilities, the effort from the community itself is important in adopting ICT for cultural preservation.

CONCLUSION

The first objective was to identify the level of ICT adoption including ownership, time spent on ICT, and ICT skills among the native communities in Sabah. Overall, the native community in Sabah adopted well to modern ICT tools, particularly handphone. The increasing trend of using smartphone was more prevalent among the youths as compared to the elderly groups. The elderly groups still prefer to use conventional ways of communication, mostly with an old model feature phone. The time spent on ICT usage among the native community, on average, corresponds with the mainstream community, which is three to six hours daily. The native community also possessed above basic skill levels in operating ICT tools especially handphones and internet among the elderly groups, who can be considered as novice users.

The second objective was to identify the factors that encourage the adoption of ICT among native communities in Sabah. Among the four factors measured, all the factors showed p-value < 0.05, which indicates all the factors are significantly impacting cultural preservation. In terms of strength of correlation, effort expectancy with a beta value of 0.295 showed the strongest influence among the factors.

The final objective of this research was to identify the impacts of ICT adoption on cultural preservation of native communities in Sabah. Among the seven elements measured, the impacts on arts showed the highest percentage mean score (75.8%) while the impacts on beliefs and rituals showed the lowest percentage mean score at 70.2 percent. However, the low score for impacts on beliefs and rituals could possibly be because the respondents were very protective of their own native knowledge and would not like to share much with others. Nevertheless, the percentage mean score across the elements did not show much significant differences. The percentage mean score of all the elements showed that the respondents were agreeable to the impacts on ICT cultural preservation.

RECOMMENDATION

- There are a few areas of recommendations which include education and training, internet outreach, implementation of digital inclusion policy, promoting internet and digital communication as human rights, adopting ICT for nation-building and promoting digital economy.

- Internet centres have been significantly important to improve the communities accessibility to internet, enhance ICT skill and literacy. Thus, there needs to be proper rebranding and restructuring of the training content to have more quality and to be comprehensive and relevant to the community. Quality digital capability programmes focused on the vulnerable elderly groups need to be more sensitive to their needs by seeing them as first-time users.

- It is important for the government to improve the internet outreach. Community WiFi and internet centres must be made available to communities and schools. On top of that, repositioning the role of library as a digital library can be implemented to enhance digital inclusion.

- Ministry of Communications and Multimedia has emphasised that making internet access wider and extensive is a basic right for the people. Hence, a comprehensive digital inclusion policy should be established and adhered for inclusivity of the community especially the indigenous, youth, women and elderly. A functional policy must be accompanied with a check and balance mechanism.

- The government should adopt the five approaches, "Specific, Measurable, Achievable, Realistic, Timely, Evaluation and Re-evaluation" (SMARTER) in its developmental action plan towards provisioning internet and Digital Communication as Human Rights. In working towards the plan, reference to the guideline from the Indigenous and Tribal People in Independent Countries Convention, 1989 (No. 169) should be put in place and adopted to protect the culture of the indigenous.

- That ICT should not only impact human activities but must also be imperative platforms for promoting different cultures and in doing so, further contribute towards building a united and harmonious nation.

- As the world is experiencing tremendous development in ICT and technological development, the community can utilise ICT as a digital economy platform to promote their cultural products, handicrafts and cultural tourism.

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Digital Media Literacy:

Developing a Measurement Framework for Malaysian Secondary School Students

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ABSTRACT

Young people spend a large portion of the awake hours on digital technologies; but being digital natives does not mean that they are digital literates. With increasing urgency, media scholars, regulators and policy-makers have pointed to the need to create national standards of digital media assessment which would provide empirical bases for evaluating digital media literacy and digital participation of young people in Malaysia. This measure is important to facilitate interventions to ensure that we produce generations of young people who have good ideas, skills and values when approaching data-rich and complex digital media environments. A digital media literacy measurement framework with ten components and specific indicators under each component was created for use in a practical manner for research and policy impact. The components are: Operational, Information Navigation, Social, Mobile, Creative, Critical Understanding, Digital Citizenship, Safety, Regulation and Problem-Solving. The digital media literacy measurement framework was then tested and the findings suggest that on a scale of 1 to 5, the majority of participants in this study were on Level 3 – Fairly Competent, indicating the need for more educational endeavours in digital literacies among young people.

Keywords: Digital media, Media Literacy, Media literacy measurement, young people

INTRODUCTION

The integration of digital media technologies in everyday life of young people is a priority across many parts of the world today as governments devote significant resources on media and digital infrastructure, devices, learning materials and trainings. Digital media technologies permeate the realms of personal lives, school, workplace, leisure, communication and social interaction, health and wellbeing as well as participation in local and global communities (Kamaruzaman Jusoff & Nurul Nadiah Sahimi, 2009; Coiro, J., Knobel, M., Lankshear, C., & Leu, D.J., 2008; Livingstone & Helsper, 2010; Erstad, 2015).

Cognisant of the crucial role of media literacy in today's society, the Malaysian Communications and Multimedia Commission has taken leadership in advancing research on media literacy in Malaysia. Specifically, there is an interest in exploring efficient ways of measuring competences among the Malaysian population and in creating national standards of digital media assessment.

A media literacy measurement framework is important in developing a critical mass of tests that is able to measure competence in productive participation in knowledge producing communities today. Such a framework is advantageous towards understanding appropriate educational and research enterprises that can be taken to empower young people to become active and responsible participants who have critical autonomy in making decisions and choices, as well as proper communication capacity when engaging with people with diverse perspectives.

Therefore, it is important to assert here that Malaysian young people's media lifeworld is unclear as an appropriate measurement instrument to assess media literacy in a holistic way is yet to be developed. This distinct gap means we are unable to provide a reliable and a fair picture of young people's operational, strategic, safety and creative capabilities when navigating media environments.

There are three major challenges in Malaysia. The first is the lack of an appropriate measurement framework to assess digital media skills; specifically, among young people who have grown up in technology immersed milieus. Secondly, any assessment framework has to address diverse geographical and social cultural contexts of young people's lives. Thirdly, it has to be pragmatic, cost-effective and address quantitative and qualitative dimensions of involvement in digital media situations. Work on a digital media literacy measurement framework is essential as it will make a positive contribution to knowledge on young people's personal, social and cultural development and their understanding of digital media participatory cultures.

The present study is interested to develop a digital media literacy measurement framework to identify the different levels of young people's skills, online engagement and activities. A more holistic view of digital media literacy was taken to search for instruments that are capable of measuring novel skills required for productive participation in today's communication and digital media settings.

Research objectives:

- To examine definitions, concepts and approaches to digital media literacy measurements appropriate to the Malaysian context;
- To identify key indicators that would measure digital media literacy;
- To design a digital media literacy measurement framework that can be used in a practical way in the Malaysian context;
- To test the digital media literacy framework among the Malaysian young people; and
- To reveal findings of the application of the measurement framework.

LITERATURE REVIEW

Digital media literacy assessment is becoming a major issue at a time when the use of digital media technologies does not necessarily mean that users are media literate and competent. Often, the digital generation is assumed to be a group of young people who are super-users of digital content and highly competent in their use of digital technologies (Shanthi, Ambigapathy, Prasad & Aaron, 2013). A more critical stance is needed to specify the characteristics of this varied group and their digital media practices.

In this vein, the development of a digital media literacy framework within a national context has attracted the attention of media scholars and policy-makers in many countries including United States of America, United Kingdom, Europe, Canada, Australian, India, China and Sri Lanka. Developing such a national or regional framework, however, has been deemed a daunting task by many, given the challenges in the conceptualisation and methodology of digital and media skills measurement (Bulger, 2012; Livingstone and Wang, 2013; Hobbs, 2010). Many existing

instruments do not capture the full spectrum of skills propounded by digital media literacy scholars and cannot be transferred unproblematically to local contexts.

There are numerous studies on digital media literacy teaching and learning experiences by teachers. However, there is a lack of discussion on instrument design to assess media literacy competences. Despite the challenges, media literacy assessment instruments have been developed in numerous countries to pave a critical direction and to pool data and expertise in enhancing media literacy research efforts at local and global levels.

The quest for a digital media literacy assessment tool in Malaysia is fraught with difficulties. Digital media literacy competences are not assessed because they are not taught in broader contexts in Malaysian schools. As such, there is no awareness of the existing gaps in the area and no measures of monitoring progress of digital media literacy among young people.

The first step taken was a review of literature, definitions and indicators relating to digital competence and media literacy. Among the key works that were instructive in the study include the following: Jenkins et al (2015), Hobbs, (2010), Ala-Mutka (2011); EU's DIGCOMP framework further developed by Ferrari (2013); UNESCO (2013); van Deursen & van Dijk, (2014); Committee on the Rights of the Child Report, (2014) and Hoechsmann & Dewaard (2015). The review showed that there are many contentions on the concept of digital media literacy which delve on questions of skills, attitudes and social and political factors in each country context that impinge on different types of learning.

There are debates on skills for reading, writing and calculating using available tools on paper, images and wiki. Generally, most frameworks comprise of knowledge, skills and competence components. A number of the frameworks were complex while some indicators and measurement of digital competence appeared to be difficult and not well suited in different socio-cultural school settings in Malaysia.

In the literature reviewed on measuring media literacy in the United Kingdom, Livingstone (2011) observed a number of practical problems in such assessment research. She argues that it was difficult to frame a media index that could reveal comparisons among the population given the different research foci, methodologies and samples employed in the studies. She further asserted that most research works are based on small samples and tend to focus on particular aspects of digital media literacy.

This is not helpful in constructing a general picture of media literacy levels among the population in United Kingdom. Most importantly, Livingstone affirmed that much of the media literacy research efforts have rarely attempted estimates of scale when setting out to discover the media literacy levels of young people.

Bulger (2012) deliberates on the digital media literacy assessment design criteria and highlights challenges in measuring criteria to assess media literacy levels in all EU member states. She argues that given the breadth of contexts and behaviours associated with media literacy, a simple 20-minute survey, no matter how well designed, cannot provide the comprehensive measures necessary to inform policy. She recommends that the design include a modular measurement framework, encompassing contexts and competencies like access, critical understanding and communication to be conducted in a rotating survey over a 5-year period. The measurement framework proposed by Bulger, however, has not been utilised by the EU member states, given issues of costing.

The task of developing a media literacy assessment instrument in the United States and Australia is also contentious given the differences in expertise and expectations regarding quality metrics, data collection and potential bias when developing frameworks for measurement. Frameworks for Information Literacy, Media Literacy and Media and Information Literacy, as noted by Renee Hobbs (2010), reveal some of the diverse theoretical lines related to the new literacies that concern different scholarship, practice and intellectual interests. Jenkins

(2006), for example suggested the need for policy and pedagogical interventions which focus on the following:

- *Participation:* access to the opportunities, experiences, skills, and knowledge for full participation in the digital age;
- *Transparency:* learning to see clearly the ways that media shape perceptions of the world; and
- *Ethics:* understanding professional training and socialisation for public roles as media makers and community participants.

In another vein, the American Association of College and Research Libraries (ACRL) proposes an assessment framework (2014) encompassing five elements for understanding Information Literacy as follows:

- Determining the extent of information needed;
- Accessing information in an effective and efficient way;
- Evaluating the information and resources critically and incorporating them into a knowledge base;
- Using information for a specific purpose; and
- Understanding the legal, economic and social context surrounding information in order to be able to use it in an ethical and legal way.

The framework proposed in Australia (National Assessment Programme, 2014) for media literacy development considers skills and competences related to three elements:

- Technological skills;
- Abilities to work with the information; and
- The use of information to communicate.

It is clear that the task of designing a digital media literacy measurement is a difficult one and involves consideration of many factors. Nonetheless, due deliberation must be given to the approach, feasibility, implementation, duration of time and costs so that the needs of addressing media literacy as a positive regulatory measure is available. As the population of young people and their respective digital skills evolve, it is crucial for MCMC to continue initiatives in developing and updating assessments instruments to support critical autonomy in the digital media environments.

METHODOLOGY

The study adopted an exploratory approach where both quantitative and qualitative methods were used. Given the problematic nature of quantifying critical and creative works, this measurement framework also delved into qualitative methods that provided valuable, quality information on young people's media practices. A total of 191 participants from different geographical locations, including Sabah and Sarawak were involved. The research was conducted between June 2015 and December 2017.

Several current digital and media literacy measurement frameworks and initiatives were collected and analysed to arrive at a practical framework that could be used in the Malaysian context. The digital media literacy framework matrix proposed comprises of 10 dimensions based selectively on the structure and works developed by Ala-Mutka (2011), Ferrari (2013) and van Deursen, A.J.A.M., Helsper, E.J. & Eynon, R. (2014). This framework provides a general overview of the needs of young people aged 16 to be competent in a digital society.

The study deliberated on the challenges related to time and cost constraints, specifically in taking time to administer research activities in school settings which are very examination oriented. In addition, it is asserted here that the framework was pitched at a level that will enable young people aged 16 from diverse school settings to participate in the project. It is helpful to state that while computer or ICT classes are conducted in schools, these remained largely as technical dimensions and less attention was given to broader contexts that encompass cognitive and ethical dimensions.

Development of the Digital Media Literacy Measurement Framework

The reviewed literature on design of media literacy assessment instruments revealed that the efforts in this area have three major foci:

1. Conceptualisation of media literacy components;
2. Methods employed to measure media competences; and
3. Assessment of scales and scores used.

1. Conceptualisation of media literacy components

While the readings on framework on media literacy indicators listed many components and competences, we have constructed a framework with 10 components. Working from the efforts of Ala-Mutka (2011), Ferrari (2013) it considers digital competence as a combination of Information skills, Communication skills, Content Creation skills, Safety skills, and Problem Solving skills.

In a similar vein, van Deursen et al (2014) acknowledged that internet skills are a more elaborate concept that encompass several domains. They argue that many existing

internet skill measurements focus merely on the technicalities of internet use. They suggest that skills should be measured beyond the basic technical level and in relation to the ability to work with communication technologies for social purposes and proposed Operational, Navigational, Mobile, Informational, Social, and Creative as categories in the measurement framework.

Given that the domains identified by Ferrari (2013) and van Deursen, A.J.A.M., Helsper, E.J. & Eynon, R. (2014) were rather broad and included many items, we broke down the above domains and added additional categories to make ten components. These components were aligned with the ten themes that were identified in the design of interactive comics in a parallel study of productive practices among young people in secondary schools. The smaller components, we assert, enable a more focused way of thinking about the measurements of internet and media skills.

The digital media literacy measurement framework in this study proposes ten components detailed as below:

Table 1: Proposed ten components of the digital media literacy measurement frameworks

Ser.	Component		Sub-component
1	Operational	1	Adjusting privacy settings
		2	Retrieving information for class assignments
		3	Uploading files & photographs
2	Information Navigation	4	Identifying different types of information (news, advertisement, opinion columns, fiction etc.)
		5	Looking for information from different authors and websites
		6	Deciding on keywords for online search
3	Social	7	Ability to interact with people from diverse communities by respecting multiple perspectives
		8	Finding relevant communities and groups that suit personal interests & needs
		9	Knowing which information should and shouldn't be shared online
4	Mobile	10	Keeping control of the costs of mobile app use
		11	Considering other people's privacy when taking any pictures of those around
		12	Installing apps on a mobile device
5	Creative	13	Designing a webpage/blog/digital poster
		14	Using a variety of media to develop self-expression on social media
		15	Making video, music and images creatively with online apps
6	Critical Understanding	16	Knowing the difference between news and sponsored articles for promotion purposes
		17	Assessing the truthfulness of information before sharing them on social media
		18	Checking who created media content, why it was created and whether it was credible

Ser.	Component	Sub-component	
7	Digital Citizenship	19	Knowing what to do when a social media account has been hacked
		20	Taking appropriate action when a friend is being bullied on social media
		21	Contributing to comments on online discussion (online forum, blog or wiki) on social issues encountered in everyday life
8	Safety	22	Tracking how one's digital footprint can be seen by others
		23	Knowing when to avoid activities that are considered as cybercrimes
		24	Blocking unhealthy content published on the internet
9	Regulation	25	Knowing about Malaysian laws that affect users if they spread lies and dangerous comments on websites
		26	Understanding rules and rights related to content creation
		27	Knowing how and when to acknowledge the source of information in essays and creative work
10	Problem Solving	28	Able to evaluate the problem by gathering appropriate information using digital tools
		29	Working in teams to choose the best answer to solve the problem
		30	Creating thoughtful explanation with the support of digital applications

2. Methods employed to measure digital media competences

The proposed digital media literacy measurement framework in the present study comprises of three major sections: self- assessment (10%), digital media literacy test (40%) and digital activities (50%). Self-assessment takes up only 10 percent given limitations in the self-assessment approach where respondents may underestimate or overestimate his/her competences. The digital media literacy test is made up of two sections: Multiple-choice questions and answers (20%) and True/False answers on knowledge statements (20%). Digital activities involve the designing of a digital poster (20%) as well as a two (2) to four (4) minutes video production (30%). A score sheet was prepared to enable the facilitator to observe and evaluate the competences in the ten components. The details of the proposed digital media literacy measurement framework are presented in the Figure 1.

Table 2: Digital Media Literacy Measurement Framework

Self-Assessment (10%)	Digital Media Literacy Test (40%)	Digital Activities (50%)
Questionnaire	Multiple Choice Questions (20%) False/True Knowledge Statement (20%)	Digital Poster (20%) Video Production (30%)
• Operational • Information Navigation • Social • Mobile • Creative • Critical Understanding • Digital Citizenship • Safety • Regulation • Problem Solving	• Operational • Information Navigation • Social • Mobile • Creative • Critical Understanding • Digital Citizenship • Safety • Regulation • Problem Solving	• Operational • Information Navigation • Social • Mobile • Creative • Critical Understanding • Digital Citizenship • Safety • Regulation • Problem Solving

3. Assessment of scales and scores used

In the current study, the Likert-type format was used in the self-assessment section. Respondents were asked to indicate their competency in the above ten components using the scale 'Don't know', 'Know a little', 'Fair', 'Competent' and 'Very competent'.

For the digital test section, one mark was given for the right answer, while zero was scored for the wrong answer. Sample questions in the test are as follows:
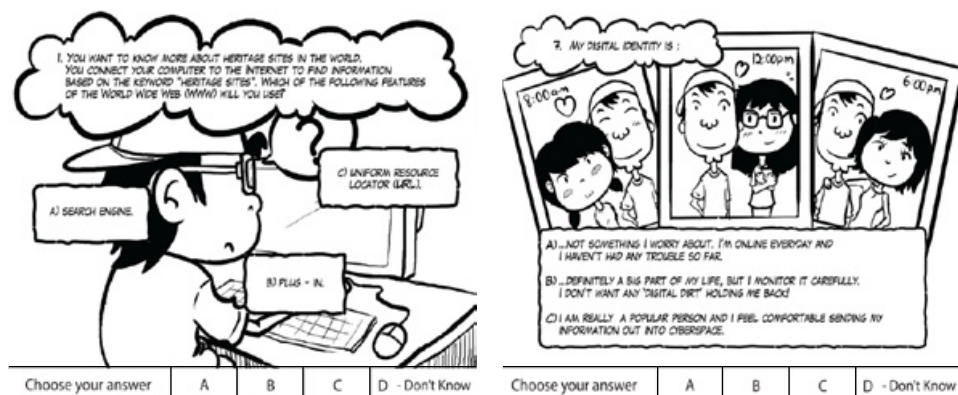

Figure 1: Sample questions in the digital media literacy test

For the digital activities, participants were required to design digital posters and a short video production on media matters confronted by young people. The participants worked in groups over a two-day workshop held in school settings. Workshop facilitators observed participation and production processes in the project activities and rated the work of the participants.

In the activity on poster design and video production, the 191 participants were given topics like cyberbullying, online scam, online safety and privacy, managing online emotions, hurtful words and sexual harassment. These were some of their media and online experiences that they encountered that were raised in their focus group discussion. The participants were shown some of the applications that were available in the tablets that could be used for poster design and video production.

Participants then used tablets and mobile phones to perform numerous tasks like uploading photographs/icons/images, deciding on keywords, gathering appropriate information using digital tools and installing apps on a mobile device. Facilitators were trained and asked to observe the activities of participants to give scores to the different actions. The scores were based on the Media Literacy Measurement Framework components and the specific items listed under each category. The ten components had three items each, totalling to 30 items. The facilitator was asked to indicate competence levels on scale of 1 (Not competent) to 5 (Very competent).

All marks were tabulated according to the levels indicated in the Figure 3 below.

Table 3: Grade of Competence

Grade	Definition	Grade of Competence
Level 1: < 30	Not Competent (NC)	The participant has difficulty orienting him/herself in digital media environments and while he or she may have access to media technologies, the capacity to evaluate and create communications in a variety of contexts is weak. The participant is not competent in digital media literacy.
Level 2: 30 – 49	Less Competent (LC)	The participant is able to access and orient him/herself accordingly to the 10 components within digital media environments with simple capacities to evaluate and create communications in a variety of contexts. The participant is considered as less competent.
Level 3: 50 – 69	Fairly Competent (FC)	The participant is able to orient him/herself accordingly and is fairly able to engage in several interconnected activities in evaluating and creating communication in a fair manner. The participant is fairly competent in media literacy.
Level 4: 70 – 89	Competent (C)	The participant is able to orient him/herself accordingly and is skilful in engaging in several interconnected activities in evaluating and creating communication in a knowledgeable manner. The participant is competent in media literacy.
Level 5: 90 – 100	Very Competent (VC)	The participant is able to orient him/herself accordingly and is highly skilled in engaging in several interconnected activities in evaluating and creating communication in a very efficient manner. The participant is very competent in media literacy.

A strong literacy measurement framework must not only be able to reveal grades but also to offer feedback so that intervention strategies can be planned. As young people complete self-assessment surveys and tests as well as perform production tasks, the scores obtained will offer insights into the strengths and weaknesses of young people's digital media literacy competences in specific areas as outlined in the ten components. The digital risks that confront young people as well as positive experiences that can build resilience can then be addressed in educational and research enterprises.

FINDINGS

The digital media literacy measurement framework was tested in 12 urban and rural secondary schools in Malaysia.

The proposed digital media literacy measurement framework and the findings of scores attained by the 191 young people are presented in Figure 4.

Table 4: Scores of Digital Media Literacy Levels according to the ten components

Component	Percentage						
	Self-Assessment (10%)	False/True Knowledge Statement (20%)	Multiple Choice Question test (20%)	Digital Poster (20%)	Video Production (30%)	TOTAL (100%)	Grade
Operational	7.09	14.55	14.14	15.68	16.13	67.60	L3
Information	7.02	5.86	8.80	10.76	13.12	45.55	L2
Social	7.82	14.14	7.12	10.13	14.23	53.43	L3
Mobile	7.97	18.01	14.14	14.16	15.77	70.05	L4
Creative	5.64	17.07	12.04	11.54	15.55	61.84	L3
Critical Understanding	7.10	15.81	15.71	9.55	10.18	58.35	L3
Digital Citizenship	6.75	18.12	15.08	9.37	13.45	62.76	L3
Safety	6.68	15.18	11.73	9.76	11.81	55.16	L3
Regulation	6.82	9.21	15.29	9.06	9.27	49.65	L3
Problem Solving	7.72	11.10	14.03	14.08	17.70	64.64	L3

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Table 5: The findings of the measurement framework revealed interesting insights as below:

Assessment	Findings
Self-assessment	• The participants were quite confident with their digital media competences.
	• The participants gave themselves quite high scores for Mobile, Social, Problem Solving, Critical Understanding, Operational and Information.
	• They were moderately confident of their competences in Regulation, Digital Citizenship and Safety. The participants appeared to be less confident in the creative component.
Digital Media Literacy Test	• The participants appeared to have difficulty with competences in Information, Social and Regulation as they scored less marks in these domains.
	• The Information component had the lowest score with many participants not sure about looking for information from different authors and websites and in deciding on keywords for online search.
Digital Media Activities (Poster Design and Video Production)	• The participants had lower scores in Critical Understanding, Digital Citizenship, Safety and Regulation aspects.

The results of the Digital Media Activities assessment show that participants had problems in critical understanding, specifically in knowing the difference between news and sponsored articles for promotion purposes; assessing the truthfulness of information before sharing them on social media and in checking who created the media content, why it was created and whether it was credible. In the case of Digital Citizenship, it was found that participants were not competent in contributing to comments on online discussion on social issues encountered in everyday life. In the Safety component, participants were found to be unconcerned with privacy settings. They left their digital footprint, personal details, photographs and their notes in the tablets. There was also a lot of uncertainty in their understanding of rules and rights related to content creation. Several respondents felt that the 'cut and paste' approach was acceptable and did not know much about acknowledging sources of information in assignments and in creative work.

On the whole, many of the participants attained Level 3 – Fairly Competent in many of the components. Information navigation requires serios attention given that the participants achieved low scores in the domain, especially at a time where fake information dominates public discourses on communication. On a brighter note, participants appeared to do well in the Social domain, indicating their capability to interact with diverse people by respecting multiple perspectives and easily finding relevant communities and groups that suit their interests.

The overall final scores of digital media literacy among the participants were put together and the results are as follows:

Table 6: Digital Media Literacy Levels

Grade	Frequency	Percent
L1- NC	0	0.0
L2- LC	12	6.3
L3- FC	171	89.5
L4- C	8	4.2
L5- VC	0	0.0
Total	191	100

The digital media literacy measurement framework found that most participants (89.5%) achieved only Level 3. About 6.3 percent of the participants attained Level 2 while only 4.2 percent of the participants realised Level 4. The findings indicate that more research and educational action plans are needed as any incompetence will become a barrier to their social integration and personal development.

The task of developing a digital media literacy measurement framework was a challenging one given that this was the first attempt to carry out such an exercise in Malaysia. While the conceptualisation of the measurement framework was thought-provoking and note-worthy, executing it in a conventional form in restricted school settings was a major limitation. The complexities of Malaysian school settings (time, resources, access to internet, crowded curriculum, institutional support, etc.) were real, and these emerged as critical issues that need to be deliberated carefully when continuing this important work of digital media literacy assessment in Malaysia.

Rather than undertaking a paper and pen test as done in the present study, it is suggested that a digital media literacy test be constructed on a digital platform to enhance digital media literacy assessment activities in Malaysia. Good internet connection and access to mobile phones/tablets/computers are essential for this to take place. Perhaps the measurement framework can be integrated into school settings to present a more cohesive and cost–effective instrument.

It must be asserted that careful consideration must be given over the physical space, learning environment and ecosystem if the assessment is to take place in school settings. Specific resources and physical hardware that continue to evolve are major challenges that need to be confronted. Our experience in this demanding task raises a few issues that need attention:

- The measurement instrument should address mobility, so that respondents can work on handheld digital devices to complete the media literacy test.

- Digital activities have to be a core element of the assessment instrument.

- Learning terrains such as schools need to be open to encourage infrastructures with high speed Internet and openness in teaching, learning and assessment methods.

- Measurement frameworks and assessment instruments can be become challenges if not structured within clearly established policies and guidelines from the Ministry of Education and MCMC.

At this critical juncture, it is hoped that the comprehensive findings of this study will lay out some of the gaps in digital media competences and provoke policy makers and educationists to engage in an informed debate on the implementation of a national digital media literacy agenda for young people.

Focus group discussions on digital media competences

Apart from developing and testing the digital media literacy measurement framework, focus group discussions were also held with participants to gain understandings of their digital media practices and experiences in relation to the ten competences.

Operational

In retrieving the information to design the posters and developing short video clip as a group, the students relied on inspiration from Google and YouTube. The information obtained not only gave them new ideas but also enhanced existing ideas. YouTube was particularly popular with these participants as it presented various examples on how sound and effects could be integrated in their video clips.

Information Navigation

In addition to using Google or YouTube to search for information, participants also used Google Image search. It enabled participants to search the web for image content. However, there were participants who reported experiencing difficulty in finding the required information for the posters and short video clips. When not able to gather much information on a particular issue such as 'stalking' they concluded that the limited information found online was because it was a trivial issue. As described by one participant,

Well, we did not have much information about stalking so we cannot create many things..... Nobody really cares about stalking so there is nothing on the internet. It is not a very big issue; it is just like... Yes, they care, but it is quite minor overall... and it is very minor. Very less has happened. (R3G1)

The views of respondents depict the obstacles participants confronted in information navigation. Given that the bulk of information was found in the English language, some of them had to grapple with identifying different types of information and resorted to searching for images. There were some issues with deciding on keywords for online search and some of them did not obtain the information that they were looking for. The views of the participants on the complexities of searching for information illuminated the low levels of scores received in information navigation.

Social

The participants of the workshop were also asked whether they would share the posters and video clips they designed and developed to raise awareness of the themes discussed. Several participants had problems in knowing which information can or cannot

be shared with their friends. They believed that sometimes sharing may be construed as intrusive by their friends.

The conversations revealed that the participants generally were able to interact with people from diverse communities and respected the multiple views. Most of them noted they were capable of finding relevant communities that suited their interests, but sometimes were not so sure about sharing information.

Privacy

During the group interview, the participants were asked about their views on privacy with regard to using pictures of themselves and/or their friends when designing the posters and developing short video clips as a group. Some participants were of the opinion that permission was needed not only for uploading a person's photograph online but also in taking a person's photograph. However, there were participants who believed that permission was not necessary if the photos uploaded online involved their close friends. The quality of a photo was also a factor in relation to privacy. According to the participants, permission was not required for photos of themselves and/or their friends that turned out well. These photos could be uploaded publicly online as it did not embarrass anyone. If a photo did not turn out well, they felt that permission was required from those involved before it was posted.

The views of participants revealed that there were mixed awareness and understanding about privacy, especially when it came to sharing pictures of friends online. Some of them could easily install apps that were able to edit photographs and thus share acceptable

pictures. Privacy and asking permission were not seen as serious issues. Some others, however, have had negative experiences and asserted that it was important to seek permission.

Creative

The participants used various devices and applications to complete the given digital activities. While some of them did not have enough knowledge, they used devices such as the tablet, mobile phone, laptop, and screen recorder to complete tasks related to preparing digital posters and short videos. Some participants made efforts to use other apps to be creative in their work.

During the group interview, the participants explained that they used a variety of media to create their posters and videos. The use of various media helped the students to develop digital competence and self-performance. The students were appreciative for the opportunity to learn and utilise digital skills such as downloading photo and using editing software to add text and edit video.

Bagi saya, best buat video ini kerana membuat video ini kadangkala hobi saya juga. Saya suka membuat video dan lihat orang membuat video itu menarik yang kita juga berasa ingin ikut. Jadi, saya juga berniat hendak menjadi seperti dia yang pandai membuat video. Apabila saya membuat video dengan sendiri, baharu saya tahu susah juga membuat video ini. (PMTR1)

> *And also I've learned much things about video editing. My friend taught me. So I'm happy through that. Maybe I could bring up this thing further. (SDMS1)*

Working in groups enhanced their self-performance. The students mentioned development of self-discipline through listening to and respecting every members' views. This enabled them to complete the tasks easily. They also added that these creative skills were useful for their current studies and the future.

Critical Understanding

Critical understanding, as a component of media literacy, is reflected in the way the research participants assessed the truthfulness of information obtained from media before using it in the assignment, their understanding of the assignment, and their reflection on the experience of completing the assignment.

Based on the focus group discussions, it was found that the participants often associated the truthfulness of information with its sources; with Wikipedia perceived as a reliable source.

Apart from Wikipedia, the participants appear to believe that what they see on television is verified information. For instance, a participant explained that Lazada is a trustworthy website, unlike Instagram, because it has appeared on television (SMSR1), while another participant claimed that "news basically shows the reality" (MPR5).

Others reported that they would confirm what they read with parents, teachers, and friends. Their responses seem to suggest that they perceived other people as more knowledgeable and depended on them to assess the reliability of the information in question. In their opinion, other people's feedback could be taken as an indicator since many "likes" means that it was a piece of information that was reliable. Another participant said that his parents would know and verify what is believable.

There was evidence that the participants lacked competence in judging the reliability of information. Many of them admitted to not knowing how to do so, and thus they would accept everything they read as true:

> *Actually, I think, there are ways to confirm if it is fake or if it is true and real. There are ways but we just do not know. We need to learn. (MPR3)*
>
> *Q1: Macam mana kita mahu tahu informasi yang kita dapat dari internet itu betul atau tidak? Informasi yang benar ke tidak ke?*
> *R8: Main agak.*

In general, there was a lack of critical reflection among participants on the purpose of the assignment and the process of completing the tasks. They noted that they were seldom involved in reflective thinking and did not question many things in their daily lives. Questioning the media was deemed a non-issue and they were not trained on thinking about such matters.

Digital Citizenship

Many of the participants had not thought much about their roles in digital citizenship. While many of them had experienced cyberbullying or had friends who encountered these problems, they felt that they had inadequate knowledge to address it. The participants shared their digital posters and video to contribute to online discussion. Apart from getting 'likes' and some comments, they felt that there was not much online discussion on the issues.

The participants observed that they needed more knowledge and practice to improve their competences in this area. The analysis emphasizes the need to expand the competence discussion on digital citizenship such as knowledge of where to seek assistance and supporting others using digital technologies. The importance and potential influence of support mechanisms has not been adequately discussed in many studies in Malaysia. It is clear that there is a need for more attention, reflection and integration of support mechanisms to enhance understanding of digital citizenship.

Safety

Safety is a crucial aspect in using digital devices. During the project, the participants logged into various sites to search for and download information and materials. However, while the majority of the students' responses indicated that they were aware of the need to logout from the devices they had used, some were of the opinion that if they login as guests, it was not necessary for them to logout.

> *For the Chrome Book, I didn't logout because it is in guest mode. (SDMS6)*

Clearing the digital footprint such as history gathered mixed feedback from the participants. Some students lacked knowledge of what was footprint history and the need to take cautionary measures. They asserted that they did not know about footprint, thought that the computer would clear the footprint itself and their use of the sites would not be recorded and could not be tracked.

> *Mungkin komputer ini clear sendiri. Nak block benda tak baik itu...tak pasti (GRSR4)*

> *Hmm, tak clear sebab tak tahu. Ada history yang boleh tengok jugak ah?Pasal nak block bahan-bahan...not clear (SDM, S5)*

Overall, the data indicated there was a major lack of knowledge related to safety, specifically in addressing one's digital footprint, knowing when to avoid activities that are considered cybercrimes and blocking unhealthy content on the Internet.

Regulation

Similar to safety matters, participants generally lacked knowledge about regulations. Many of them were not sure of laws in Malaysia that affect them. While a few students mentioned that they did know about rules and regulations related to plagiarism, they said that they did not have the time to acknowledge the sources. Others were of the view that the persons in charge, like teachers, did not have the time and energy to track the use of copied materials in school assignments. On the other hand, some participants believed that if they did not make money from using the original creation, it was not necessary to request for permission to copy the materials. Also, they believed if the creators shared something on the internet, this meant that they are allowing the public to use their creations. In relation to knowledge of rules and rights related to content creation, the participants did not know how to acknowledge the sources.

The digital activities which enabled participants to work on digital posters and short video triggered their thoughts on media law, rights and rules when working with materials taken from the Internet.

Problem Solving

The participants' competence in problem solving was analysed in terms of their ability to use appropriate technologies and programs to complete the assignment, how they worked in teams to choose the best solution to accomplish the tasks, and the extent to which they created thoughtful explanations with the support of digital applications.

Most of the participants explained that they used specific digital tools and programs to source for materials and information. For example, one group looked for suitable music on Facebook (SSR5), and another group downloaded images to a mobile phone before transferring them to the tablet.

They did not have clear reasons for choosing the software and applications they used in their creative works. This revealed that they had not critically thought through their decisions. Ease of use and familiarity were two common reasons given by the participants:

For some, the experience of using technologies helped them to reflect on their own digital competence. Many of them realised that handling of digital tools and applications was more difficult than they thought.

To manage the assignment, some participants took the initiative to set up chat groups to discuss their tasks after school.

> *Kami buat group di WhatsApp... saya invite mereka semua then kami bincang sudah buat dia punya lakar-lakar, gambar suruh mereka baca faham dulu supaya esok tidak lagi kelam kabut.(TSR2)*

The participants were asked whether there was thoughtful reflection about their work. A participant said he took into consideration other people's views and privacy while taking photographs for the assignment. Another participant explained that the group screened the images that its members had found online and if the members were not sure whether an image was offensive, they would consult the facilitator.

On the other hand, offensive remarks or images were sometimes deemed inevitable or even necessary for the completion of the assignment. A participant asserted that "sometimes if you don't offend others, they don't know their mistake".

In general, with guidance from the facilitators, the participants attempted to make thoughtful posters and short videos. In doing so, many of them were able to gather appropriate information using digital tools and present different perspectives about the topics that were given to them. In some instances, they encountered problems in their projects, but the conversations in focus group discussions opened pathways for reflective thinking and practice about digital media literacy in a broader sense, making this project a huge success.

CONCLUSION

Research findings as seen in this study revealed that quite often, young people grapple with difficulties in areas like information navigation, content creation, safety, regulation and critical understanding. They are likely to see their engagement with digital technologies as simple and straightforward, to be taken at face value rather than being mindful of their consumption and taking responsibility for their participation in digital cultures.

Today, digital media literacy is a core area of knowledge that is essential to empower students to critically evaluate the information they access, to better understand the materials they need and the meanings they convey as well as to respect diverse views and to take responsibility for their online actions. A national digital media literacy programme that advances a measurement framework is an essential step in enhancing young people's capacities in confronting challenges, seizing opportunities as well as exercising rights as active and responsible digital citizens.

The digital media literacy measurement framework proposed here entails ten components composed of three items each to gauge the capacities of young people to deal with the demands of digital environments. It has a strong empirical base and includes both quantitative and qualitative dimensions of digital media engagement. It is essential that the framework includes digital activities that are practical-oriented to offer a more comprehensive knowledge of how young people deal with contemporary social challenges resulting from technological advances.

The digital media literacy measurement framework presented here is a first attempt in delivering a reference framework that can readily be used in secondary schools in Malaysia. The framework can be updated based on new knowledge and advances in technologies and work must continue in this area so that education, research, training and assessment activities can contribute towards the empowerment and critical autonomy of young people.

RECOMMENDATION

In accordance with the findings of this study, it is recommended that:

- MCMC takes the lead in a large scale action to address the media literacy agenda by pressing forward a policy that gives this Digital Media Literacy Measurement Framework a more structured place in the Malaysian education landscape. MCMC will fuel the policy debate and bring stakeholders together to improve the framework conditions for literacy through the Commission's Recommendation on Digital Media Literacy.

- The Ministry of Education has an important role. It is important for MCMC to apprise decision makers to the strengths of the measurement framework and its currency in the present digital environments.

- MCMC adopts the conceptual framework proposed in the digital media literacy measurement framework in this study to conduct assessments in different population groups in Malaysia. While the 10 components offer a sound base to the structure, it is essential that specific target groups are identified and the measurement instrument be tailored to suit the local setting and context. The instrument should include digital and practical oriented activities.

- MCMC sets up a high-level experts Group to provide expertise and guidance on media literacy policies that focus on learning, assessments and research. The experts representing academia, government ministries, industry and civil society will deliberate on media literacy objectives, assessment rankings among different groups, new digital and media trends and promote the best practices at the national level and propose actions to follow in advancing media literacy standards.

- A lead institute of higher learning will become responsible for testing and refining digital media literacy components and the development of items according to different groups. Available forms of assessment and diagnosis of the impact and consequences of certain cultural settings, knowledge, skills and values aligned to the national education philosophy need to be investigated. It is important that emergent paradigms of research on media literacy assessments are shared with different stakeholders and advocates of media literacy.

- Opportunities to establish media literacy and assessment efforts with international collaboration be created. This is helpful to gain a global focus for the assessment frameworks that have been developed as well as to understand common ecological and social challenges among the world's media literacy practices.

- MCMC continues to fund and support the updating of the measurement framework based on new knowledge and new development with technologies so that education, research, training and assessment activities can contribute towards the empowerment and critical autonomy of young people.

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Impact of MCMC's

Smart Community Initiatives

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ABSTRACT

This study investigated the impact of initiatives taken by MCMC in its effort to develop smart communities. By looking at the communities' ICT adoption and usage at district levels in Kemaman, Putrajaya, Lundu and Kota Belud, this research intends to uncover its impact on empowerment of the communities. The objectives of this project are firstly, to examine the factors that drive the usage/participation, satisfaction and continuance intention in MCMC's smart community initiatives, followed by uncovering the impact of MCMC's initiatives on the community itself, and finally to develop an index that captures the essence of a smart community so that the involved stakeholders can be informed about the necessary criteria which enables citizens to be deemed as smart. Various initiatives have been carried out under the Smart Community projects such as enhancement of infrastructure, provision of ICT-related and entrepreneurship training, development of digital applications and others. Overall, the residents in all four locations scored an average level of digital savviness based on the calculated smart community index. It is pertinent for the districts to be assessed from time to time to track their development towards becoming smart communities. The research framework for this study drew basis from two main theories namely UTAUT 2 and the Use-Diffusion Theory. These are established information systems theories which possess strong explanatory ability in explaining behavioural intention and technology usage using a parsimonious set of variables. Factors such as performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value and habit were posited to decide whether the community uses the smart community initiatives. This, in turn, affects satisfaction which then leads to the continued intention to use the initiatives.

Keywords: Smart community, UTAUT 2, Use-Diffusion Theory, Smart Community Index, ICT adoption and usage

INTRODUCTION

Everywhere, communities are seeking lifestyle changes through the use of ICT applications. For the same reasons, the astonishing diffusion of digital technologies due to the expansion of the internet is the main basis of the rollout of smart community facilities in Malaysia. Access to the internet was previously limited due to very complicated information systems. This restricted opportunities to explore the use of new technologies and new media to give shape to new urban spaces. However, the inception of mobile phones and the transition to other "smart" devices has opened up opportunities to create direct relationships between individuals and communities and between communities and decision-makers. Among the impetus to improve the quality of life of the community were the National Policy Objectives introduced

by the government via Communications and Multimedia Act 1998 (CMA) . Some of the major aspects that were emphasised in the Act urges the industry to establish a civil society equipped with high level of consumer confidence and skilled labour that would make Malaysia become a major centre and hub for communications and multimedia information and content services.

The Universal Services Provision (USP) programme has been a key effort in supporting the National Policy Objectives through the provision of various communication infrastructures such as broadband services and smart devices to the community especially in rural areas. The network is the fundamental building block to smart community applications. Over the years, its evolution has included dramatic advancements in both wired and wireless networks. The country is now on the cusp of the advent of Internet of Things (IoT) applications which are the building blocks of smart community principles. Network infrastructure has a pivotal role and it is important for relevant agencies to identify what is most critical today to ensure the success of smart community initiatives.

Policy makers also realised that equipping the community with high speed internet and smart devices were not sufficient to change and improve the quality of life of the community. The smart community concept was brought in to bridge the gap. Emphasising community participation, this programme is aimed at enhancing the lifestyle of rural and suburban communities to be on par with urban communities. Emphasising local solutions that benefit the community, the aim is to create responsible and sustainable solutions to problems faced by the community. For instance, ICT access enable disaster management which became one of the flagship applications in the MCMC's Smart Community initiative.

The initiatives encouraged involvement by all the stakeholders pertinent to ensuring the success of the projects. These include local Influencers, local authorities, institutions, and local content and application creators and developers. The approach took a wholesome and bottom-up approach by looking at infrastructure improvement, replicability, scalability, reachability and sustainability. Communities came together to contribute towards the successes of the smart community projects. This was illustrated by the many instances where schoolteachers, village committees and district officers worked hand in hand to participate and drive the projects. The commitment shown is an indicator of the sustainability of the project.

The bottom-up approaches empowered them to make their own decisions for the future of their community. Institutions such as Government Linked Companies (GLC) were enrolled as collaborators to become catalysts that promote innovativeness and creativity in both economic and social aspects among the community . Through the collaborations, ICT specialists were brought in to share their knowledge and skills and to motivate local residents to participate. MCMC designed and deployed different initiatives for each locality according to the community's requirements. For instance, Security and Integrated Flood Operation Network (S.A.I.F.O.N) was introduced at Kota Belud where flood occur frequently.

The overarching objective is to provide the rural population of Malaysia with ICT services and applications at an affordable rate in order to boost penetration levels and bridge the digital divide between the rural and urban areas.

Problem Statement

The process of urbanisation is causing the young to migrate to cities in many developing countries. People move to cities to find more jobs opportunities and to have a better life. There is little to motivate them to remain in the rural areas, with lack of amenities, poverty and an uninteresting life being some of the push factors. Cities are the focal area of economies, symbolising better opportunities, fortunes and lifestyles. But, with the youth leaving, towns and villages will become even smaller, while cities will be too crowded to live in. This is where the concept of smart community comes in with the objective of developing areas outside the cities through provision of internet facilities and technologies to help make places vibrant and added value to the community.

In the last two decades, discussions on the concept of smart community have increased in scientific literature as well as at international policy making levels. The applications of technology within communities are considered key elements to move forward into the future. For change and advancement to happen, policy makers, the government, broadband internet marketers, telecommunication firms and others who are involved in broadband need to be able to develop relevant policies and marketing strategies to maintain or to further improve the smart community concept among Malaysian citizens. Nevertheless, most smart city studies previously conducted concentrated on established metropolitan cities where ICT use is already high. On the other hand, not much has been documented on smart community projects in lesser developed districts, in both academic and non-academic literature. Moreover, the development of an index that would be able to ascertain the important criteria and elements of smart community development is sorely needed.

An index would be able to track changes within the community, in particular the improvement of lifestyle and quality of life, the empowerment of the community, its regional and global competitiveness, productivity levels and the generation of a creative and innovative culture among the community.

Four sites have been selected for the deployment of smart community initiatives, namely Kemaman, Kota Belud, Lundu and Putrajaya. Each of this location has its own problems, which ICT can help to solve.

The research objectives are as follows:
1) To examine the factors that drives the usage/participation, satisfaction and continuance intention in MCMC's smart community initiatives;
2) To uncover the impact of MCMC's initiatives on the community itself; and
3) To develop an index that captures the essence of a Smart Community so that the involved stakeholders can be informed about the necessary criteria which enables citizens to be deemed as smart.

LITERATURE REVIEW

Smart City versus Smart Community

The 'Smart Community' will provide comprehensive solutions encompassing energy, water, and medical systems in order to realise a synergetic balance between environmental considerations and comfortable living. ITU-T Focus Group on Smart Sustainable Cities established a concrete definition for smart sustainable cities, which can be used worldwide. They reviewed 116 definitions of smart sustainable city from different sources such as academic, government, and corporate. In their report, smart community and smart city are considered as having the same concept. Similarly, Albino, Berardi, and Dangelico (2015) did not differentiate the terms of smart city and smart community and they treat these two terms with the same meaning.

They clarified the meaning of the word "smart" in the context of cities through an approach based on an in-depth literature review of relevant studies as well as official documents of international institutions. However, a smart city initiative needs to create a community where all citizens can engage more easily and effectively (Paskaleva, 2009). Ishida and Isbister (2000) debated some similar terms such as digital community, smart community, digital city, information city and e-city. Tanabe, van den Besselaar, and Ishida (2003) considered all of those alternative terms are used to refer to a connected community that combines broadband communications infrastructure. The geographical dimension (space) of smart communities is varied; it can be extended from a city district up to a multimillion metropolis (van den Besselaar & Koizumi, 2005). Harrison et al. (2010) agreed that Instrumented, Interconnected and Intelligent were the three fundamental factors for a smarter city.

Nam and Pardo (2011) in their study that attempts to conceptualise smart city with multi-dimensions stated that there are various definition of smart city and the majority of them are focusing on hardware development by providing infrastructures and services such as education, health care, transportation and so on. This is congruent with other existing literature. Whereas Eger (2005) pointed out that creating a smart community is all about collaborations and connectivity where internet, knowledge creation and innovation are the core elements in the community. These definitions appear to differentiate between the smart city and smart community. Researchers agree that the gap that exists between these concepts will require further clarifications (Stratigea, 2012). It must be noted however that how it is defined will determine the development path taken.

Smart City Threats and Issues

Gurstein (2014) argued that the current trend of developing more and more smart cities has deviated from its original objectives that attempt to improve the quality of live. Many smart cities development plans emphasise the installation of edge cutting technology rather than giving attention to educating innovative citizen and empowering community development projects. Eger (2005) agreed that it should not just be about technology and ICTs, it should be about jobs, dollars and quality of life. Planners should seek to understand how the local citizens perceive the infrastructure and facilities in their daily life and activities, which is one of the objectives of our study. Furthermore, Gurstein (2014) criticised the current imbalanced situation where politicians and major technology corporation utilise "smart city" as a PR tool and mainly focus on urban and desirable areas, tending to ignore rural and less attractive suburbs, particularly in less developed countries where the living standards barely reach the basic requirement. Governments' initiatives to develop "smart cities" is tantamount to transferring the resources from the poor to the rich, as resources are deployed on installing high technology and expensive devices, whereas there are still people with limited access to basic living facilities such as health care, environmental management and security.

Since the provision of critical and basic infrastructure is essential, it could be said that a smart city development plan should separate into several stages with the first priority being the provision of basic facilities including healthcare, education, transportation and security, which are particularly important for developing countries. In order to develop a smart city, it should first fulfil the requirement to be a city and thereafter high technology infrastructure such as IoT, broadband and other ICT initiatives can be introduced and act as catalyst to drive smarter development (Nam & Pardo, 2011). Hence, there are opinions stating that the direction of development should focus on producing smart communities rather than smart cities and that the ultimate goals of a smart community should be on nurturing smarter citizens who are able to utilise infrastructure and facilities to optimise their lives and at the same time the community itself should be able to sustain itself as it would have acquired the knowledge and is well prepared to be part of the smart community (Eger, 2005).

Characteristics of Smart Community

Smart Citizen

Evidently, it shows the needs to shift to develop a smart community rather than smart city where social inclusion, enabling citizen, and supporting community should be included in the city development agenda (Gurstein, 2014). Wongbumru and Dewancker (2014)'s study focussed on how next-generation technology was utilised and integrated into communities particularly through improving citizen innovation and participation to achieve the goal of improving quality of life. Japan was cited as an example of an initiative that not only focused on smart energy management, but went further to smart community by involving all the stakeholders with the aim of achieving behavioural change through lifestyle innovation. Moreover, the author also highlighted the challenges that emerged where although infrastructure for smart energy system was provided, citizens displayed lack of participation. The study concluded that raising up a "smart citizen" should be a priority before successfully creating a smart community (Wongbumru & Dewancker, 2014).

A smarter city should be treated as an organic system - as a network, as a linked system and smart citizen is part of it (Nam & Pardo, 2011). In order for the "smart citizen" to be fully integrated to the entire system, the citizen should first be educated on how to "infuse" themselves in the smart system. Without knowledge, the sustainable cycle of the system cannot be maintained and will become a huge hinderance for long term sustainable development. Only a smart and innovative citizen who acts as motivator for the entire system ensures the smooth network and linkage among the smart initiatives; with they themselves being the beneficiary of the smart system.

Training

Stratigea's (2012) work focused on relating the smart cities concept to community development by adapting the concepts from Intelligent Community Forum (ICF) that demonstrated the critical success factors for cities "going smart" and presented in a pyramid structure. Broadband infrastructure acts as the first fundamental base while knowledge-based workforce is on the second level. Apart from infrastructure and facilities, it is important to educate the skilled workforce to support further development. Eger (2005) agrees that internet and broadband access is just the first step and an integrated intelligent community is a catalyst to economic growth (Hughes & Spray, 2002).

Smart Governance

A new decision-making mechanism which incorporates the community into city planning should be introduced (Eger, 2005). Hollands (2008) emphasized that the way citizen interacts and become a member of the society is the primary success factor of a smart community and information technology plays a role not just as a physical infrastructure but by offering opportunities to empower and educate the "smart citizen". Frost and Sullivan (2019), a consulting and research firm, identifies eight key aspects that define a smart city. Smart citizen is one of the aspects and has the main role of building the smart community (Singh, 2014).

Gurstein argues (Gurstein, 2014) that the current situation is centralised, with a top down approach. The voices and opinions of the citizens are given the lowest priority when it comes to city development. All stakeholders from every segment in the society should be included and none of the segments should be neglected. Public private partnership that involve locals towards realising a connected society is an example (Hughes & Spray, 2002). The focus should be on cooperation and emphasis on shared governance with the participation of the citizen being essential.

The government plays a key role too by providing policies and governance in smart city initiatives (Nam & Pardo, 2011). In their study where they conceptualised smart city with dimensions, they pointed out the element of institutional factors which include integrated and transparent governance, strategic and promotional activities, networking and partnership. The government should be more transparent and accountable by sharing information to citizens, so that they could voice their opinions and be part of the decision making process. Smart governance is set to be the cornerstone of smart city. Therefore, partnership and collaboration could prove to be an effective approach that connects public, private and individual in an effective bottom-up mechanism.

Implementation of Smart Cities in Asia

China

Smart city development is favoured by governments and developers as it has been proven that ICT could improve the quality of life. Smart community planning took place in Yishanwan, Jiangxia District, Wuhan. The community was developed alongside a comprehensive framework to achieve the targets of infrastructure deployment, establishment of a sharing platform, development and research of an application system and a service portal (Anrong, Li, Li, & Kong, 2016). In the development plan, the synchronous development of informatisation, new industrialisation, agricultural modernisation and new urbanisation act as the core of developing the smart community. The authorities placed special emphasis on agricultural modernisation as it plays an important role in rural areas and act as the foundation for the suburban area to develop through urbanisation. (Anrong et al., 2016) agreed that it is insufficient to only improve infrastructure and also stressed the innovation ability of the society that integrates the concept of sustainability to city development (Chourabi et al., 2012).

Japan

In Japan, Smart Community is often defined as taking full advantage of IT technology to effectively control power flow and provide new services for power supplies and consumers (Gao, Fan, Ushifusa, Gu, & Ren, 2016). This is different from the definition in other countries and this smart community model can be described in four parts, which are new information network, new energy system, new transportation system and new urban development. Emphasis is placed on smart energy grid implementation as a way to transform citizens towards the smart lifestyle in terms of daily life, work or office and transportation. There are four large scale demonstration cities in Japan which implement smart community concepts. These are Kyoto Keihanna District, Yokohama City, Kitakyushu City and Toyota City. All the demonstration cities have the similar target of reducing the emission of Greenhouse Gas (GHG). IT technology smart-grid electricity management was introduced and most of the researches about smart community are on the use of renewable resources. For instance, eco-town project was introduced with the aim of building a system that uses all the waste products of an industry as raw materials for another industry, realising a zero-waste recycling-oriented society.

Malaysia

Medini Smart City in Iskandar Puteri, Malaysia was chosen to be the pilot for smart city projects. It focuses on three areas, economy, environment and social and promotes six dimensions: smart economy, smart governance, smart environment, smart mobility, smart people and smart living (Ghazali et al., 2016). This project is a collaboration between the university and the regional development agency. The project focuses on infrastructure provision and change of quality of life and environment as long term targets through engaging local citizens for sustainable development. However, Gil and Navarro (2013) argued that in terms of governance and policy context, which were one of the factors in analysing smart city initiatives, the participation of locals seems to be lacking from the technology partnerships. However, there was a noticeable response from the aspect of education as are some internationally well- known universities such as University of Newcastle plan to open up campuses in Medini.

METHODOLOGY

Both qualitative and quantitative methods are used in this research to investigate the awareness and acceptance of the Smart Community Initiative by the local communities by each district. The approaches used in this research are as follows:

	Qualitative	Quantitative
Methodology	Interview (30-35 Minutes)	Survey Questionnaire
Objective	• to explore the factors that drives the usage and participation, satisfaction and continuance intention among the citizens in the areas • to look at the impact of MCMC's initiatives on the community among stakeholders	• to determine the factors that were affecting acceptance; and then in subsequent stages the important factors were modified to measure usage continuance behaviour, usage satisfaction and its confirmation.
Respondents	Purposive sampling • 8-10 members from Pusat Internet for each site, except Putrajaya, where were from the residents and/ or employees within the area • 19 stakeholders (13 males, 6 females)- Influencers, district officers, community leaders, village heads (Ketua Kampong or Rukun Tetangga), teachers and officers who helped to facilitate the implementation of 'smart community' initiatives. Seven respondents were in their 50s, six in their 40s, 5 in their 30s while only one respondent was in their 20s.	Purposive sampling • 150 respondents for each site except 200 at Putrajaya
Timeframes	May-June 2017 (Community) January-May 2018 (Stakeholder)	

The collected data was analysed using Statistical Package for Social Science (SPSS) and Partial Least Square Structural Equation Modelling (PLS-SEM). Upon completion of data collection, data was entered to SPSS. Data was screened and cleaned to eliminate any errors and any incomplete survey was discarded. Later on, with the help of SPSS, demographic information and respondent profile was analysed. As for calculating the Smart Community Index (SCI), the average points of different items and factors were calculated and presented according to quartiles. While for PLS-SEM, assessments of both measurement and structural models were conducted to determine the reliability and validity of the measurement items and to ascertain the relationships between latent variables that were hypothesised in the research model (Hair et al. 2011).

Limitations

- This study undertaken covers only four Smart Community project locations in Malaysia (excluding Langkawi).
- The Smart Community initiatives examined in this study are grouped into three main broad categories, namely infrastructure, content training and digital services.
- Smart city is not discussed in great length here in this study as the emphasis is on smart community.
- There is still no full coverage of internet connectivity in Lundu and Kota Belud and their surrounding areas. At certain points in time, receptions of some telco service providers' signals were very bad.
- A range of diverse MCMC's Smart Community initiatives posed a challenge in generalizing the survey instrument.
- Communication during fieldwork was a challenge considering that the interview respondents at the project sites in Kemaman, Kota Belud and Lundu spoke in their local dialects, making it difficult for the team to understand their responses. In addition, some of the respondents either felt shy or were reluctant to share their views or talk on the subject.
- The research instrument was generalised to accommodate both urban and rural Smart Community project sites. Some areas have initiatives which are different and some have initiatives which are yet to be implemented.
- Based on the research, the index developed was based on geographical characteristic of respective Smart Community in Malaysia and also on the initiative provided by MCMC. This instrument may be unable to be generalized throughout Malaysia due to different geographical characteristics and initiatives implemented.

Theoretical Framework

In this study, the development of the research framework was based on UTAUT2 with some support drawn from another more recent theory namely the Use of Diffusion Theory.

Seven main components need to be considered in investigating the impacts and intention to continue using the MCMC's smart community initiatives, i.e. four core components from UTAUT Theory which are performance expectancy, effort expectancy, social influence and facilitating conditions with three external factors which are hedonic motivation, price value and habit.

The basic premise was that the seven main components were believed to be the predictors of usage of technological initiatives, which influence satisfaction with usage and lead to perceived impact of these initiatives. However, the relationship between the predictors and usage of technological initiatives can be moderated by a user's readiness to embrace technology as manifested in traits such innovativeness, optimism, insecurity, and discomfort.
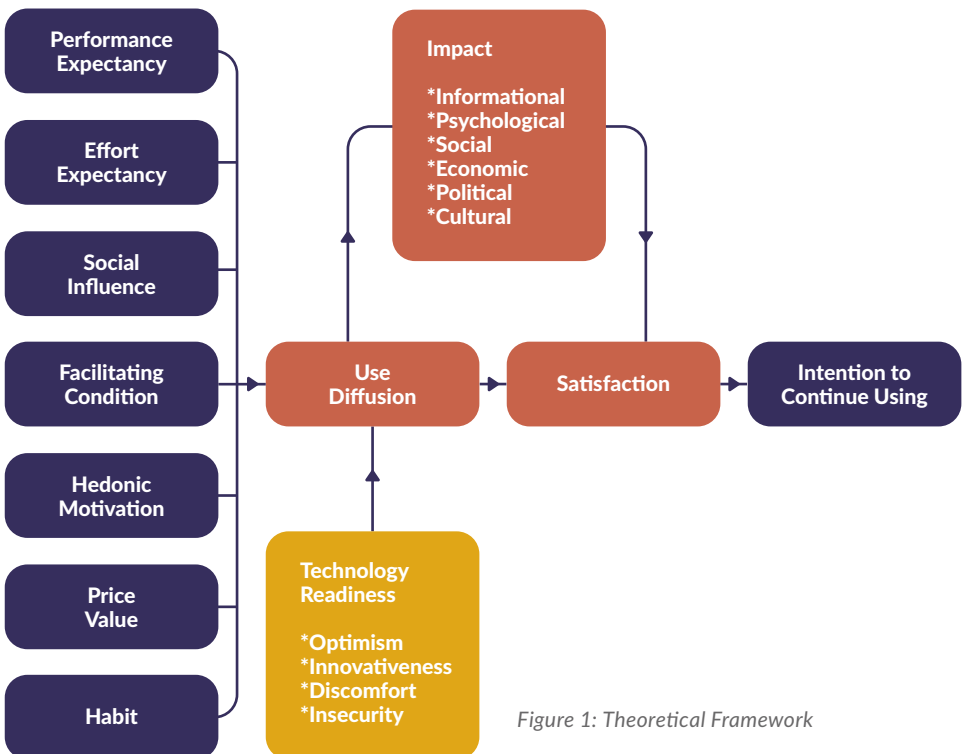
Figure 1: Theoretical Framework

FINDINGS AND DISCUSSION

Qualitative Approach
Users' Perspectives

Knowledge of Smart Community Facilities
The majority of the respondents across four sites had smartphones and access to the internet. They were either connected through the centre or home Wi-Fi on a daily basis with minimum usage of an hour. Most of them had social media accounts, for example, Facebook, Instagram and YouTube. WhatsApp had become a communication medium commonly used among the community either to communicate with families, friends or as a tool to promote their products. Others use the internet for work and education purposes.

In Kemaman, a majority of the respondents were members from the KOIL internet centre. They strongly felt that KOIL is the 'smart' centre the community. They were able to participate in computer and entrepreneurship classes. Likewise, in Lundu and Kota Belud, respondents used Pusat Internet (PI) centres, which were similar to the KOIL centre in Kemaman. Main services provided were computer and social media classes.

Six respondents in Kota Belud had started SME businesses, which helped to boost incomes. Some sell local delicacies and snacks while a female respondent in Kota Belud even managed to attain a monthly income of RM7,000-RM8,000 by running a horses and buffalos riding business.

Advantages or disadvantages of smart community facilities usage

All of the respondents agreed on the positive impact of the 'smart' phone on their daily routine work. PI and KOIL users feel that the place is convenient, with facilities and services beyond Internet enabled computers such as computer classes, entrepreneurship training, photocopying, scanning and fax machines as well as postage services. For a RM5 lifetime membership fee, the centre provides a lot of assistance to the community. Besides proximity, the members have an attachment to the centre as it is manned by locals. The intensity and engagement from a community standpoint is enhanced. In Putrajaya, the community approves the CCTV installation as they feel secure and believe break-ins and vandalism can be minimised. The majority of respondents in all sites agree that usage by the young, especially internet access should be monitored and controlled by the centre or adults to avoid misuse. They feared that too many applications and connections will slow down and affect other usage such as for business use. An example of this would be a catering business that receive orders late due to heavy usage of the PCs by others.

Intention to continue and recommend usage to others

Respondents wanted to continue using the internet centres and would recommend them to others. They feel more people should know of the facilities and services. For example, encouraging local entrepreneurs to take classes to learn how to promote their products and services.

Future of smart community projects

The respondents hoped that more internet centres can be built especially in the rural areas. There will be benefits from an economic perspective. For example, in Kota Belud and Lundu, online tourism could promote the attractive beaches, national parks, waterfalls and cultural events to local and foreign tourists. Homestay ventures could bloom. Fishermen could use social media to market their fishery products. One respondent in Lundu hoped for a mobile application that could assist fishermen to find ideal fishing locations and receive weather alerts.

There were suggestions for a 'smart' flood alert device for people living in low lying areas. This would speed up the evacuation process and minimise losses. The Water Level and Security Monitoring System and Alternative Communication Network should also be in place to minimise the impact of disasters.

Stakeholders Perspectives

Knowledge on 'smart community'

All of the respondents were well versed and understood the meaning of smart community from both the physical infrastructure and community development perspectives. They suggested that the community members should actively participate in related events, workshops and programmes.

Most of the respondents agreed that the smart community programmes should be continued with support from all – the government, private and the community itself. Suggestions given include proper guidance from experts and sufficient funds allocation to implement smart community programmes. Another suggestion is to implement programmes, workshops or courses to ensure the community has 100% communication infrastructure and services by 2020. These initiatives should come from MCMC, district officers, local Influencers and councils, and other private sectors.

Interestingly, the respondents suggested the telecommunication infrastructure should cover not only the town areas but entire areas. And that the community must maximise use of the facilities and engage in the activities provided by the smart community

centres. Comments from Respondent KB4 stressed on building more relocation and settlement centres equipped with facilities and developed digital centres for flood victims.

The respondents also listed some collaborators helping in the smart community initiatives such as MCMC, telecommunication companies, Education department, local councils, MSD Digital Intelligence Sdn Bhd, Police, Pos Malaysia, Angkatan Pertahanan Awam Malaysia (APM), Water Department, Land & Survey Department and Non-government organisations (NGOs). They also pointed out that the smart community initiatives would not be successful without support (especially on budget allocation) from the government and also private sector. Respondents from the four sites also listed projects or programmes that they are working on. For example, mobile apps, Radio Frequency Identification (RFID) for flood, solar power, My Komuniti Kreatif (MYKif)[1], U-Smart Workshop (SMART Entrepreneurship)[2], E-magazine[3], Smart Postman and Postman Community[4], Pusat Internet Desa[5], and e- commerce, SAIFON[6] and U-Smart.

Challenges faced were also discussed. Other than the usual challenges such as ensuring proper planning and continuous infrastructure development, budget and funding, the limitation of getting experts from the related fields was highlighted. Another challenge was finding good sites for telecommunications development as many villagers were reluctant to give up their land and protested such development projects. This resulted in only town areas receiving good telecommunication infrastructure and coverage. Respondents also mentioned about the need for more internet centres and for IT knowledge programmes at schools. The commitment from the youth was relatively low.

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1   MyKomuniti Kreatif is a video competition open for PI community. Refer: http://mykif.mcmc.gov.my/
2   SMART Entrepeneurship at PI, Kota Belud collaborated with MCMC, Sabah Techpreneur Association (SATA), Suruhanjaya Syarikat Malaysia (SSM), SME Corp. Malaysia. Refer: https://www.facebook.com/events/1815273595380341/
3   e-magazine at Kota Belud was launched on 23 May 2017 at Perpusatakaan Daerah Kota Belud, Sabah in collaboration with MoE, Pejabat Pendidikan Daerah Kota Belud and Majlis Buku Kebangsaan Malaysia. Kota Belud's school e-magazine was one of the finalists in the 'Access to Information and Knowledge' category for the World Summit on the Information Society (WSIS) 2018 competition in Geneva, Switzerland. Refer: http://www.thesundaily.my/news/2018/03/17/additional-rm20m-kota-belud- smart-community-20-initiative
4   . The local postman will be the representative for the community areas or towns that they live in. This will enhance safety and provide confidence to the community in terms of service delivery. Refer: https://www.malaymail.com/s/1178673/mcmc-shapes-tomorrows-postal-service
5   Pusat Internet Desa is owned by the Malaysia Digital Economy Corporation Sdn. Bhd., previously known as Multimedia Development Corporation and now, taken over by the Minister of Energy, Water and Communication (MEWC). Refer: http://www.internetdesa.my/sejarah.html
6   SAIFON is the acronym for Security and Integrated Flood Operation Network and was implemented in 2016 using high definition of closed-circuit television (CCTV) and sensors to alert the high rise of water level and flood. Refer: http://saifon.my

There is a higher proportion of female to male in this sample.

57.4%

42.6%

Most of the respondents were from the following age groups.

40-49 years old	30-39 years old		20-29 years old
20.9%	42.4%		20.1%

Given that these three age ranges had the majority number of persons.

Malay **96.5%** | Indian **2.1%** | Chinese **1.4%**

Majority of the respondents had a modest to high education background

| SPM Equivalent **41.7%** | Certificate / Diploma **24.5%** | Bachelor's Degree **22.3%** |

51% their monthly income ranged between **RM1,001-3,000**

In terms of employment

Admin/ Clerical **22.1%**

Professional/ Managerial **22.9%**

Technical Staff **10.7%** | Teacher **9.3%** | Self-employed **12.9%**

Housewife/ Househusband **5.7%** | Student **10.7%** | Others **5.7%**

Besides smartphones, majority of the respondents also own

Laptop **47.5%**

Desktop **17.7%**

95.7% respondents surveyed owned a smartphone

The average number of years of internet usage experience among the respondents was

12.8 years *(std. dev.=5.61)*

64.3% DID NOT subscribe to the home broadband plan

The responses were varied with
- some being very new to the internet (1 to 5 years)
- to those who are experienced users (> 15 years).

96.5% Mobile Data Plan Subscription

59.6% Majority were happy with quality, respondents rating the service as good.

5.1% More than half respondents who were not satisfied with the broadband service, they cited reasons such as *'speed not living up to expectations', limited coverage' and 'slow connection'.*

67.2% of the mobile data plan subscribers were happy and rated the mobile data service quality as good.

5.1% Those who were not satisfied with the quality of mobile data service mentioned reasons such as *'limited coverage' and 'internet speed' not up to expectation'.*

As many as

94.3%

respondents surveyed were aware of Kemaman being a Smart Community project area.

The various initiatives carried out by MCMC under the Smart Community project were grouped under three broad overarching themes namely **Infrastructure, Content Training and Digital Services.**

In terms of the frequency of usage for infrastructure initiatives, data services, although the frequency of usage was varied among the respondents (mean=4.77, std. dev = 2.33), *majority reported that they used data services to a large extent (mode=7).*

Initiatives Awareness

95%
Pusat Internet (PI)

87.2%
Telecommunication (telco)

68.6%
Flood Management System

66.9%
Entrepreneurship Training Workshops

Usage of the initiatives

90.8%
Telecommunication (telco)

76.9%
Pusat Internet (PI)

45.7%
ICT training workshops

43.8%
Dashboard

38.0%
Entrepreneurship Training Workshops

On the other hand, MyCrib Booking (mode=1; mean=1.25, std. dev. = 0.92) were either not used much or not used at all by the respondents.

The rest of the initiatives namely

Pusat Internet (PI)

ICT training workshops

Flood Management System

Entrepreneurship Training Workshops

MyCrib

e-magazine

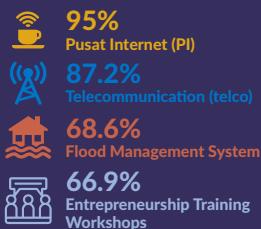did not gain much usage among the respondents *(mean for the stated initiatives ranged from 1.44 to 3.37)*

However, for those who did use PI

Pusat Internet (PI)
(mean= 3.37, std. dev= 1.97)

Entrepreneurship Training Workshops
(mean=2.16, std.dev.=1.76)

e-magazine
(mean=1.44, std. dev. = 1.08)

ICT training workshops
(mean=2.41, std. dev. =1.84)

Flood Management System
(mean=2.39, std. dev.= 2.00)

their usage was somewhere between slight to moderate use.

In fact, majority responded that they do not use at all for these initiatives (mode=1).

For the respondents who use the initiatives, generally they felt satisfied with the initiatives, as seen from the mean scores of all the initiatives which ranged from

4.94 to 5.49

except for MyCrib booking and e-magazine

Upon closer inspection, majority of the respondents were very satisfied with

Data Service

Pusat Internet (PI)

Dashboard

Flood Management System

Entrepreneurship Training Workshops

(mode for the stated initiatives = 7)

However, there is probably some room for improvement for initiatives like ICT training, MyCrib booking and e-magazine (mode for the stated initiatives = 4) as most of the respondents were only moderately satisfied with the initiatives.

Putrajaya : Respondent's Profile

There is a rather equal representation of both males and female.

52.8%

47.2%

Most of the respondents were from the following age groups.

30-39 years old
36.4%

20-29 years old
29%

given that those two age ranges had the majority number of persons.

Malay	Chinese	Indian	Others
90.7%	3.7%	2.5%	3.1%

Bajau and Dusun

Majority of the respondents had a high education background

Certificate / Diploma
35%

Bachelor's Degree
30.7%

Monthly Income

30.9% RM 1,001 - 3,000
29.6% RM 3,001 - ,5000

In terms of employment

Admin/ Clerical
22.1%

Professional/ Managerial
23.9%

Student
20.2%

Technical Staff
22.1%

Teacher
6.7%

Self-employed
4.3%

Housewife/ Househusband
1.8%

Retired
2.5%

Others
2.5%

98.8% respondents surveyed owned a smartphone

Besides smartphones, majority of the respondents also own

Laptop
55.8%

Desktop
42.3%

The average number of years of internet usage experience among the respondents was

10.74 years *(std. dev.=5.59)*

Majority of the respondent had acquired some experiences in using internet with *at least 2 years to 10 years of experience.*

54%
Subscribe to the home broadband plan

51.1%
Majority were happy with quality of the home broadband service, respondents rating the service as good.

99.4%
Mobile Data Plan Subscription

58.4% of the mobile data plan subscribers were happy and rated the mobile data service quality as good.

3.7% Those who were not satisfied with the quality of mobile data service mentioned reasons such as *'signal is not strong enough' and 'not being able to see much value in the data plan packages'.*

As many as

69.6%

of respondents surveyed were aware of Putrajaya being a Smart Community project area.

The various initiatives carried out by MCMC under the Smart Community project were grouped under three broad overarching themes namely **Infrastructure, Content Training and Digital Services.**
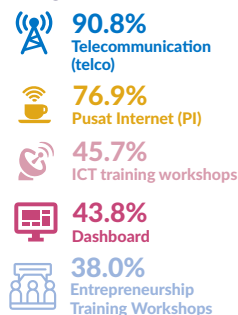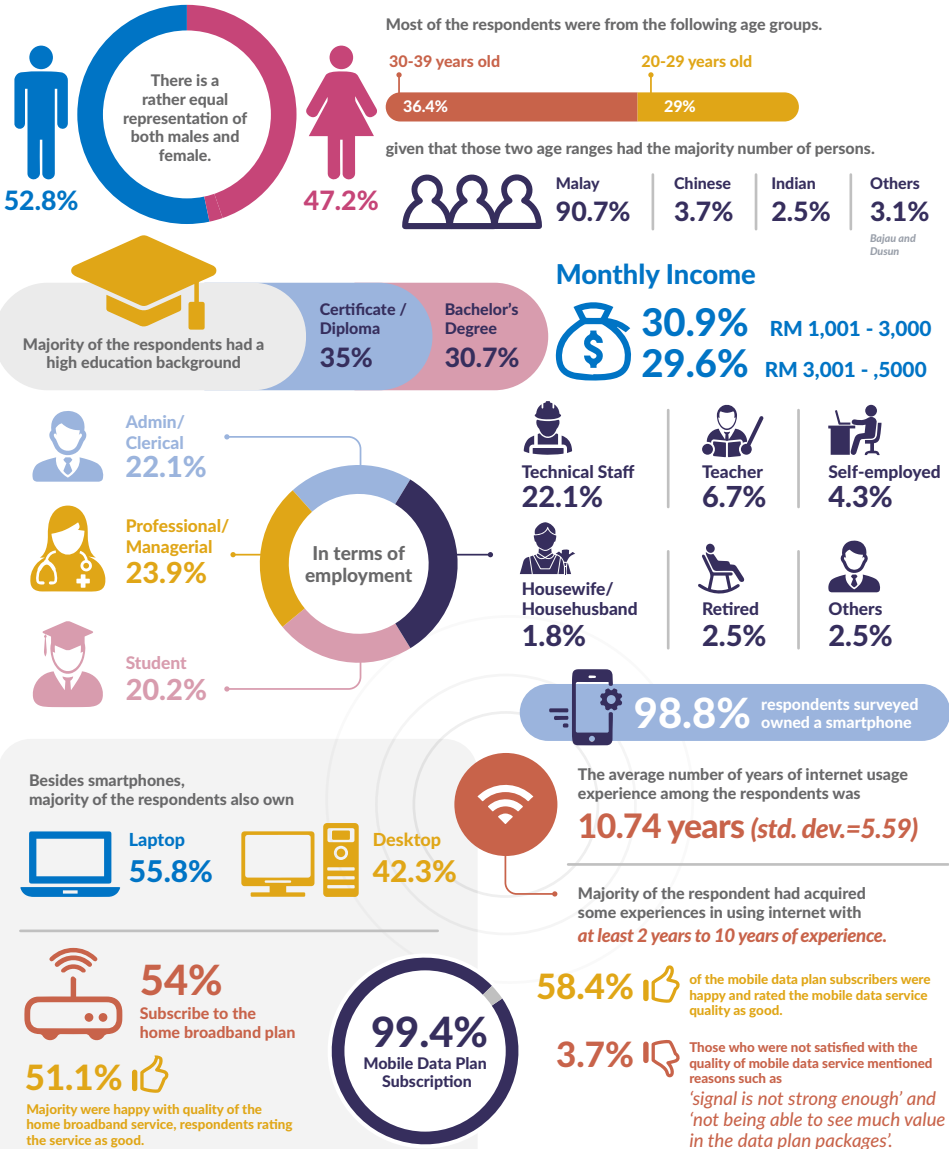
	Initiatives Awareness	Usage of the initiatives
Telecommunication (telco)	91.3%	91.9%
Pusat Internet (PI)	63.6%	31.0%
e-magazine	34.0%	17.5%
Cashless payment	42.6%	30.6%
ICT Training	39.8%	19.7%
Entrepreneurship Training Workshops	30.0%	11.0%

In terms of the frequency of usage for infrastructure initiatives, majority reported that they used data services to a large extent (mode=7) and it was the only initiative with the highest mode score of 7 outweighing the other initiatives (mode=1) and with high mean score of 5.57 (std. dev.= 1.88)

However, these initiatives were still slight to moderately used by the community

Cashless Payment
(mean= 2.20, std. dev.= 2.07)

ICT training workshops
(mean=1.78, std. dev.= 1.77)

Pusat Internet (PI)
(mean=1.95, std. dev.= 1.75)

e-magazine
(mean=1.45, std. dev.= 1.16)

Entrepreneurship Training Workshops
(mean=1.35, std. dev.= 1.16)

Upon closer inspection, majority of the respondents were very satisfied with

Pusat Internet (PI)   **e-magazine**   **ICT Training**

(mode for the stated initiatives = 7)

For the respondents who use the initiatives, generally they felt satisfied with the initiatives, as seen from the mean scores of all the initiatives which ranged from

4.89 to 5.34

Satisfaction levels for data service (mode=5) was also on the high side. However, there is probably some room for improvement for initiatives like entrepreneurship training and cashless payment (mode for the stated initiatives = 4) as most of the respondents were only moderately satisfied with the initiatives.
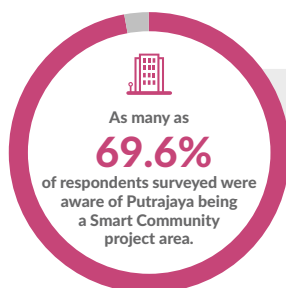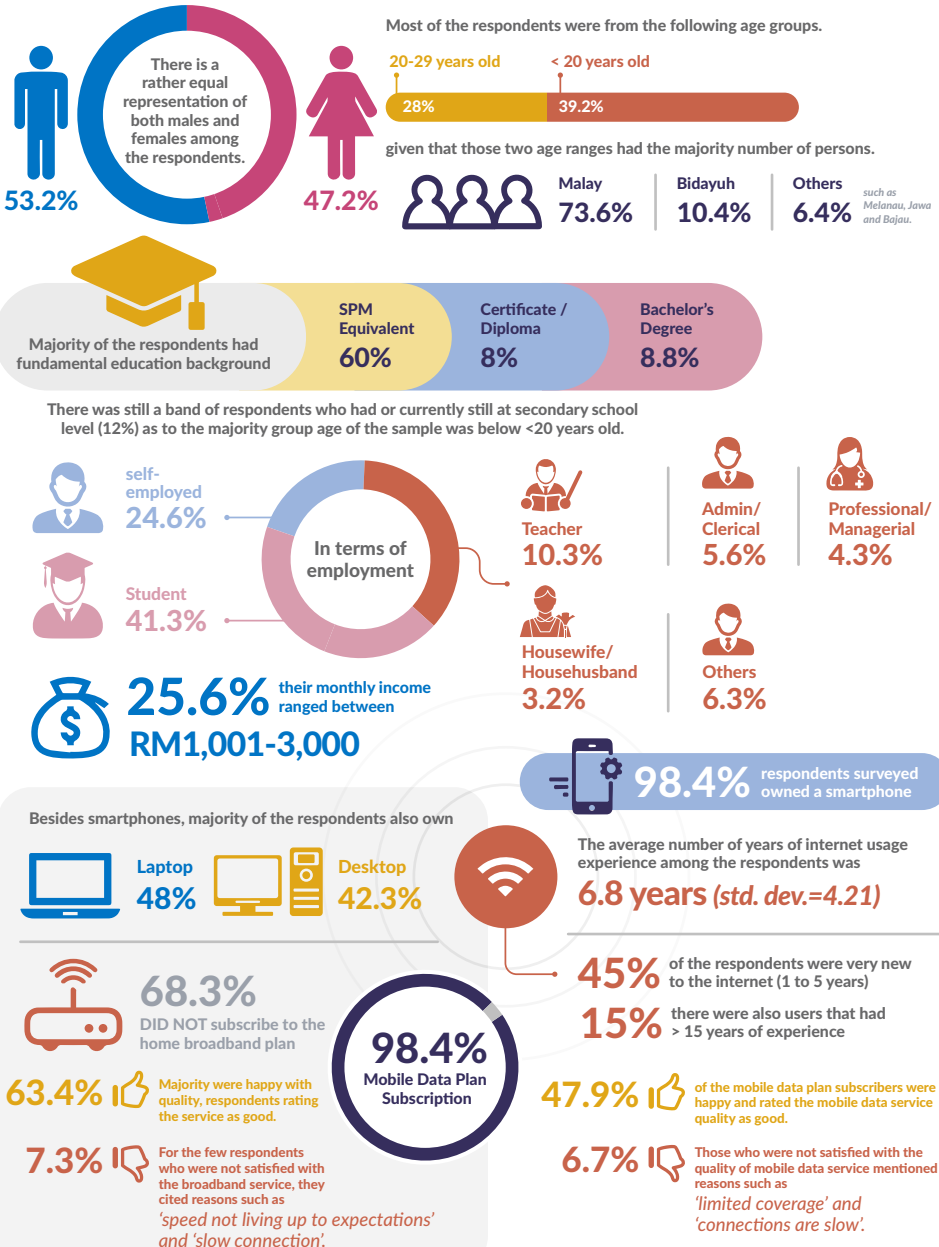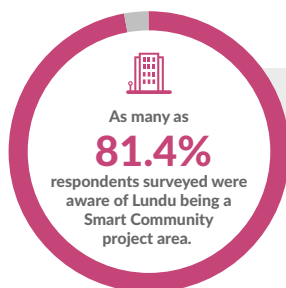
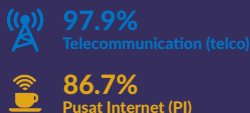There is a rather equal representation of both males and females among the respondents.

53.2%

47.2%

Most of the respondents were from the following age groups.

20-29 years old
28%

< 20 years old
39.2%

given that those two age ranges had the majority number of persons.

Malay
73.6%

Bidayuh
10.4%

Others
6.4%
such as Melanau, Jawa and Bajau.

Majority of the respondents had fundamental education background

SPM Equivalent
60%

Certificate / Diploma
8%

Bachelor's Degree
8.8%

There was still a band of respondents who had or currently still at secondary school level (12%) as to the majority group age of the sample was below <20 years old.

self-employed
24.6%

Student
41.3%

In terms of employment

Teacher
10.3%

Admin/ Clerical
5.6%

Professional/ Managerial
4.3%

Housewife/ Househusband
3.2%

Others
6.3%

25.6% their monthly income ranged between
RM1,001-3,000

98.4% respondents surveyed owned a smartphone

Besides smartphones, majority of the respondents also own

Laptop
48%

Desktop
42.3%

The average number of years of internet usage experience among the respondents was

6.8 years *(std. dev.=4.21)*

68.3% DID NOT subscribe to the home broadband plan

98.4% Mobile Data Plan Subscription

45% of the respondents were very new to the internet (1 to 5 years)

15% there were also users that had > 15 years of experience

63.4% Majority were happy with quality, respondents rating the service as good.

7.3% For the few respondents who were not satisfied with the broadband service, they cited reasons such as
'speed not living up to expectations' and 'slow connection'.

47.9% of the mobile data plan subscribers were happy and rated the mobile data service quality as good.

6.7% Those who were not satisfied with the quality of mobile data service mentioned reasons such as
'limited coverage' and 'connections are slow'.

NMRCP
Networked Media Research Collaboration Programme

As many as
81.4%
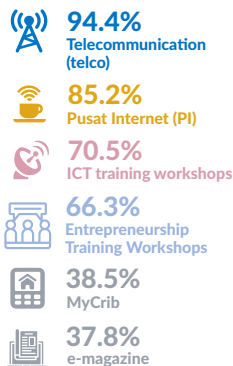respondents surveyed were aware of Lundu being a Smart Community project area.

The various initiatives carried out by MCMC under the Smart Community project were grouped under three broad overarching themes namely **Infrastructure, Content Training and Digital Services.**
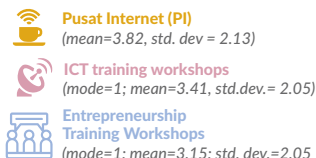
In terms of the frequency of usage for infrastructure initiatives,
majority reported that they used data services to a large extent.

Initiatives Awareness

97.9%
Telecommunication (telco)

86.7%
Pusat Internet (PI)

Usage of the initiatives

94.4%
Telecommunication (telco)

85.2%
Pusat Internet (PI)

70.5%
ICT training workshops

66.3%
Entrepreneurship Training Workshops

38.5%
MyCrib

37.8%
e-magazine

Varied responses among the respondents

Pusat Internet (PI)
(mean=3.82, std. dev = 2.13)

ICT training workshops
(mode=1; mean=3.41, std.dev.= 2.05)

Entrepreneurship Training Workshops
(mode=1; mean=3.15; std. dev.=2.05

not used much or not used at all by the respondents.

MyCrib
(mode=1.00; mean=2.17, std. dev. = 1.72)

e-magazine
(mode=1.00, mean=2.12, std. dev. = 1.71)

For the respondents who use the initiatives, generally they felt satisfied with the initiatives, as seen from the mean scores of all the initiatives which ranged from

5.24 to 5.65

except for MyCrib booking and e-magazine

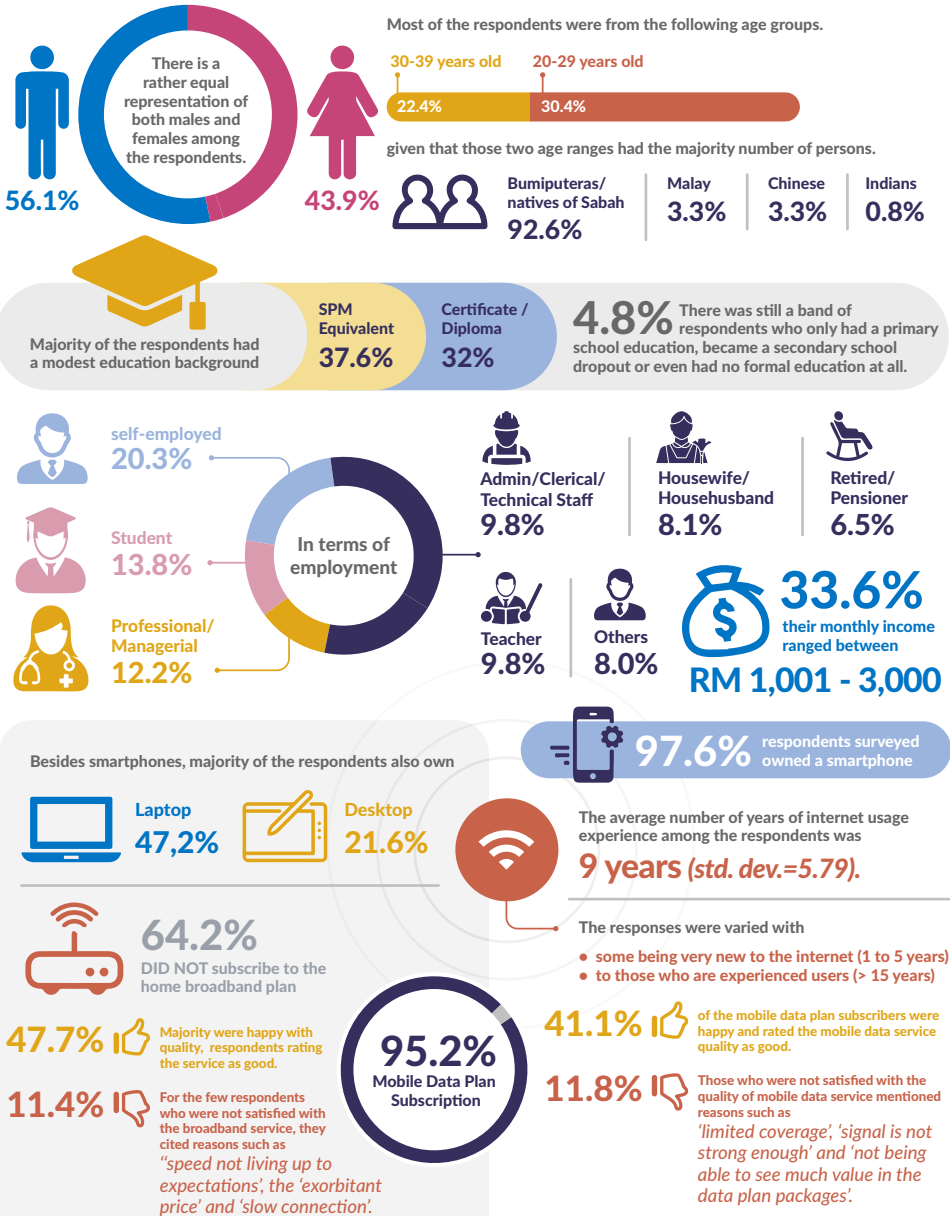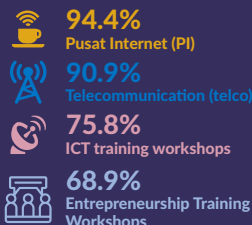However, there is probably some room for improvement for initiatives like

MyCrib booking (mode=4)

e-magazine (mode=4)

as most of the respondents were only moderately satisfied with the initiatives.

Upon closer inspection, majority of the respondents were very satisfied with PI, data services, ICT training and entrepreneurship workshop (mode for the stated initiatives = 7).

NMRCP
Networked Media Research Collaboration Programme

There is a rather equal representation of both males and females among the respondents.

56.1%

43.9%

Most of the respondents were from the following age groups.

30-39 years old 22.4%

20-29 years old 30.4%

given that those two age ranges had the majority number of persons.

Bumiputeras/ natives of Sabah **92.6%**

Malay **3.3%**

Chinese **3.3%**

Indians **0.8%**

Majority of the respondents had a modest education background

SPM Equivalent **37.6%**

Certificate / Diploma **32%**

4.8% There was still a band of respondents who only had a primary school education, became a secondary school dropout or even had no formal education at all.

self-employed **20.3%**

Student **13.8%**

Professional/ Managerial **12.2%**

In terms of employment

Admin/Clerical/ Technical Staff **9.8%**

Housewife/ Househusband **8.1%**

Retired/ Pensioner **6.5%**

Teacher **9.8%**

Others **8.0%**

33.6% their monthly income ranged between **RM 1,001 - 3,000**

Besides smartphones, majority of the respondents also own

Laptop **47,2%**

Desktop **21.6%**

97.6% respondents surveyed owned a smartphone

The average number of years of internet usage experience among the respondents was

9 years *(std. dev.=5.79).*

64.2% DID NOT subscribe to the home broadband plan

The responses were varied with
- some being very new to the internet (1 to 5 years)
- to those who are experienced users (> 15 years)

47.7% Majority were happy with quality, respondents rating the service as good.

11.4% For the few respondents who were not satisfied with the broadband service, they cited reasons such as *"speed not living up to expectations', the 'exorbitant price' and 'slow connection'.*

95.2% Mobile Data Plan Subscription

41.1% of the mobile data plan subscribers were happy and rated the mobile data service quality as good.

11.8% Those who were not satisfied with the quality of mobile data service mentioned reasons such as *'limited coverage', 'signal is not strong enough' and 'not being able to see much value in the data plan packages'.*

As many as **74.4%** respondents surveyed were aware of Kota Belud being a Smart Community project area.

The various initiatives carried out by MCMC under the Smart Community project were grouped under three broad overarching themes namely **Infrastructure, Content Training and Digital Services.**

Initiatives Awareness

94.4%
Pusat Internet (PI)

90.9%
Telecommunication (telco)

75.8%
ICT training workshops

68.9%
Entrepreneurship Training Workshops

Usage of the initiatives

85.1%
Telecommunication (telco)

82.9%
Pusat Internet (PI)

45.4%
ICT training workshops

37.3%
S.A.I.F.O.N. Flood Management System

31.6%
Entrepreneurship Training Workshops

In terms of the frequency of usage for infrastructure initiatives, there was varied responses among the respondents regarding PI whereby there were some who answered that they use to a lesser degree, *to those who use moderately and a large degree (mean=3.92, std. dev = 2.08).*

majority reported that they used

Pusat Internet (PI)
(mode=7)

Data Service
(mode=7; mean=4.57, std. dev = 2.18)

not used much or not used at all by the respondents.

Dashboard
(mode=1; mean=1.27, std. dev. = 0.92)

VHF
(mode=1.00, mean=1.01, std. dev. = 0.10)

The rest of the initiatives namely

ICT training workshops

Entrepreneurship Training Workshops

MyCrib

S.A.I.F.O.N. Flood Management System

e-magazine
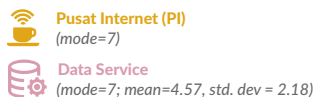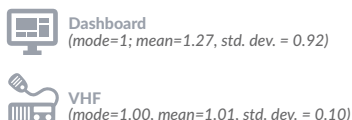
did not gain much usage among the respondents (mean for the stated initiatives ranged from 1.35 to 2.50).

In fact, majority responded that they do not use at all for these initiatives (mode=1).

For the respondents who use the initiatives, generally they felt satisfied with the initiatives, as seen from the mean scores of all the initiatives which ranged from

5.14 to 5.60

except for VHF and e-magazine

However, there is probably some room for improvement for initiatives like

S.A.I.F.O.N (mode=4)

e-magazine (mode=4)

as most of the respondents were only moderately satisfied with the initiatives.

Upon closer inspection, majority of the respondents were very satisfied with PI, data services, ICT training and MyCrib (mode for the stated initiatives = 7).

Index Development

As mentioned earlier, the four key components in the IGC development index which are Human, Technology, Information and Value were used as a reference point in developing the index. This is in contrast to other indices that measure digital divide or the preparedness' method of developing indices that use ratios and rates obtained from secondary data. Our approach is more personal, where a survey was conducted to obtain pertinent information about the community via the residents themselves. From the data gathered, certain portions were used in the development of the Smart Community Index (SCI). The portions chosen capture the four themes. However, the description of those 4 themes are varied slightly to fit the context of study for this research. The descriptions used for the four themes are listed in Table 1.

Table 1: The underlying foundations of the Smart Community Index

Theme/Component	Explanation and Importance
Human	The extent to which individuals regard ICTs in a favourable or unfavourable way. This component is important because the attitude held by person can determine how ready he/she is in embracing innovative technology-enabled changes in their lives.
Technology	The extent to which individuals have access to hardware, gadgets and also ICT facilities. This component is important because these are tools for technology usage.
Information	The extent to which individuals use and apply the initiatives introduced by MCMC. This component is important because it shows the engagement levels of individuals.
Value	The extent to which individuals have used or participated in MCMC's Smart Community initiatives and witnessed how the initiatives have helped them and improved their quality of life. This component is important because it shows the impact that technology has on the individuals' lives.

Four sub-indexes were then constructed to capture the essence of a Smart Community namely, access and ownership, use-diffusion, impact and attitude. Table 2 below shows the sub-index and the indicators for this study.

Table 2: Sub-indices of the Smart Community Index

Theme/Component	Sub-Index	Indicator	Principles
Technology	Access & ownership	1. No. of devices owned 2. Mobile data penetration 3. Home broadband penetration 4. Internet coverage (wired/wireless)	Infrastructure improvement
Information	Use-diffusion	1. Facilities 2. Content training 3. Digital services	Local content & application development

Theme/Component	Sub-Index	Indicator	Principles
Value	Impact	1. Informational 2. Psychological 3. Social 4. Economic 5. Political 6. Cultural	1. Replicability, scalability, reliability & sustainability 2. Bottom up approach
Human	Attitude of user, local Influencers, local authorities and institution	1. Optimism 2. Innovativeness 3. Discomfort 4. Insecurity	1. Collaboration with institution 2. Role of local authorities 3. Local Influencers

Each sub-index is reflected by its own indicator and measurement. Both indicators and measurement are drawn from the data obtained from the survey. Table 3 shows the breakdown of the sub-index by its indicator and measurement.

Table 3: Structure of the sub-indexes

Sub-index	Indicator	Measurement
Access & ownership	1. No. of devices owned	• Do you own a smartphone? • What other technological gadgets do you own?
	2. Mobile data penetration	• Do you subscribe to a data plan?
	3. Home broadband penetration	• Do you subscribe to broadband at home?
	4. Internet coverage (wired/wireless)	• Percentage of internet coverage within district
Use-diffusion	1. Facilities	Frequency of using the following initiatives: • Pusat Internet (all sites) • Internet subscription (all sites) • Community Dashboard (only Kota Belud & Kemaman) • VHF (only Kota Belud)
	2. Content training	Frequency of using the following initiatives: • ICT training (all sites) • Entrepreneurship training (all sites)
	3. Digital services	Frequency of using the following initiatives: • MyCrib booking (only Kota Belud, Kemaman & Lundu) • Saifon (only Kota Belud) • E-magazine (all sites) • Flood Management (only Kemaman) • Cashless Payment (only Putrajaya)
Impact	1. Informational	• How using MCMC's initiatives have helped you in your life: - Improved my capacity to use different forms of ICTs. - Improved my ability to communicate with family members and friends.

Sub-index	Indicator	Measurement
Impact	2. Psychological	• How using MCMC's initiatives have helped you in your life: - Improved my quality of life. - Improved my ability to analyse own situation and solve problems.
	3. Social	• How using MCMC's initiatives have helped you in your life: - Enhanced my ICT literacy and technology skills (i.e. repair computers) - Improved my programme management skills.
	4. Economic	• How using MCMC's initiatives have helped you in your life: - Enhanced my entrepreneurial skills. - Improved my income (e.g. through lower transaction costs, increased timeliness of sales)
	5. Political	• How using MCMC's initiatives have helped you in your life: - Improved my access to government information /services (e-government). - Improved my capabilities to interact with local government.
	6. Cultural	• How using MCMC's initiatives have helped you in your life: - Helped me to use ICTs as a form of cultural expression (i.e. design of computer graphics, websites) - Increased my awareness of my own cultural identity,
Attitude of user, local Influencers, local authorities and institution	• Optimism	• New technologies contribute to a better quality of life. • Technology makes me more productive in my personal life.
	• Innovativeness	• Other people come to me for advice on new technologies. • I keep up with the latest technological developments in my areas of interest.
	• Discomfort	• Technology always seems to fail at the worst possible time. • Many new technologies have health or safety risks that are not discovered until after people have used them.
	• Insecurity	• People are too dependent on technology to do things for them. • Technology lowers the quality of relationships by reducing personal interaction

Descriptive Analysis for Impact of MCMC's Initiatives

Analysis was run on SPSS to calculate the mean score of respective impacts and the result is presented in Table 4. In Kota Belud, Kemaman and Putrajaya, informational impact demonstrated the highest mean (M=4.18, M=4.11 and M=4.05 respectively) while in Lundu, psychological impact had the highest mean (M=4.01). Interestingly, for all locations, economic impact demonstrated the lowest mean (M=3.84, M=3.90, M=3.95 and M=3.82 respectively). Nevertheless, on the whole, the mean scores for all the impacts were relatively above the mid-point of 2.5.

Table 4: Mean Score of the impacts of MCMC's initiatives

Sub-index	KOTA BELUD		LUNDU		KEMAMAN		PUTRAJAYA	
	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev
INFORMATIONAL	4.18	0.61	3.95	0.73	4.11	0.74	4.05	0.68
PSYCHOLOGICAL	4.05	0.64	4.01	0.75	4.05	0.72	3.90	0.67
SOCIAL	4.00	0.75	3.95	0.71	4.03	0.76	3.88	0.73
ECONOMIC	3.84	0.68	3.90	0.75	3.95	0.87	3.82	0.80
POLITIC	4.06	0.65	3.93	0.68	3.94	0.74	3.94	0.70
CULTURAL	3.94	0.74	4.00	0.72	3.99	0.73	3.92	0.74

Scoring of the Smart Community Index

Based on the data gathered from the survey, the indicators of the sub-indexes were compiled and aggregated into a score ranging from 0 to 100. The higher the overall score, the higher the level of digital savviness – each sub-index also carries its own score and can be viewed on its own. Again, the higher the score for the sub-index, the higher the access and ownership and so forth. The overall aggregated scores can be split into three quartiles (based on cut-off points) and the results fall into three major ranges: Low (0 – 33.33), Average (33.34 – 66.67) and High (66.68 – 100) level of savviness. Table 5 shows the results for the SCI tabulated for Kota Belud, Lundu, Kemaman and Putrajaya.

Table 5: Smart Community Index (SCI) results for Kota Belud, Lundu, Kemaman and Putrajaya

Sub-index	KOTA BELUD	LUNDU	KEMAMAN	PUTRAJAYA
Access & Ownership	58.73	59.22	59.28	70.32
Use-Diffusion	33.89	46.47	36.40	35.07
Impact	79.56	78.78	80.22	78.32
Attitude	69.64	69.71	68.30	68.35
SMART COMMUNITY INDEX	60.50	63.65	60.63	62.89
Sample Size (N)	125	127	141	163
Level of Savviness				
Low	1 (0.8%)	0 (0%)	0 (0%)	0 (0%)
Average	95 (76%)	84 (66.1%)	101 (71.6%)	116 (71.2%)
High	29 (23.2%)	43 (33.9%)	40 (28.4%)	47 (28.8%)

Overall, the community in Lundu scored the highest index of 63.7 percent with 66.1 percent of the residents under the average level of digital savviness group and 33.9 percent in the high level. Putrajaya scored the second highest, followed by Kemaman and lastly Kota Belud with the score of 60.5 percent. On all four sites, more than 65.0 percent of the residents fell under the average level of digital savviness while 23.2 percent to 33.9 percent fell in the high level range. The community's attitude towards technology is good for all sites with scores around 68 percent to 69 percent, where they are optimistic about the presence of technology in their lives. Likewise, access to internet and ownership of devices are rather good as well, where all exceeded 50 points, while Putrajaya has the highest score of 70.3 percent.

However, Smart Community initiatives can be improved as the penetration is rather low for Kota Belud (33.%), Kemaman (36.4%) and Putrajaya (35%). Lundu has the highest score of 46.5 percent. One of the reasons that could explain the low score, for instance in Putrajaya, is due to the Use-diffusion component only reflecting the usage of MCMC's initiatives, when there are several other agencies involved in providing different services among this area as well. Moreover, cashless payment was introduced in November 2017 and data was collected between November 2017 to January 2018, while it was new with many people still unaware of this service.

Kota Belud however can be improved, as it has lowest score among the four sites. Kota Belud residents should increase their use of applications like MyCrib booking. There could also be more marketing and promotion activities to increase residents' awareness. Nevertheless, these initiatives still bring rather large impacts to the community, with most of the scores at nearly 80 percent.

RECOMMENDATION

Recommendations are split into recommendations specific to a site applicable to all four sites as well as general recommendations applicable across all four sites.

PUTRAJAYA

In Putrajaya, as many bodies and agencies run various related initiatives, cooperation and support from all are required. Attention needs to be given too to areas such as application processes and approvals so that smart community projects can be implemented in a timely manner. Collaborators here would also include those from the private sector who can work hand-in-hand to build smart community infrastructure and disseminate information through Corporate Social Responsibility (CSR) activities.

CCTV installation has been highlighted as a needed smart facility. There are suggestions too for the building of more bicycle lanes to encourage a healthy lifestyle. We hope that Putrajaya will enhance their town planning initiatives to be more user friendly and safe. Lastly, some 'awareness' programmes or campaigns would be ideal to create exposure and educate the community so that they will fully utilise facilities. MCMC, TM, and CyberSecurity come to mind as organisation that could raise public awareness and consciousness.

It is also noted that Putrajaya, being adjacent to the smart city of Cyberjaya, have benefitted because many ICT bodies, companies and organisations from Cyberjaya have contributed to the smart index through Public Private Partnerships (PPP) and NGO initiatives. More initiatives could be carried out by MCMC to increase the SCI index in Putrajaya since the community there has high IT savviness. It is a brownfield where access and ownership are the highest among the three other smart cities. For one, the cashless payment programme that was initiated at Putrajaya requires more promotion. Many residents do not know about it. Implementors could start with Alamanda shopping mall and later extend it to other shopping malls. The cashless payment initiative needs to reach those who live in or visit Putrajaya. This initiative had just started when we began this project, and it was hard to measure its success since many were not aware of it.

LUNDU

In Lundu, awareness programmes are necessary and they will require collaboration from various companies and agencies from the politics, social and economic spheres. For example, CSR programmes by Land and Survey Dept., National Security Council, District Council, Tourism,

Information Dept, The Chief Minister's Department, Immigration, PDRM, Pos Malaysia, Health Department and Agriculture Department. Small-scale programmes need to be held in small village areas. Pusat Internet centres can act as central platforms to viral information to participants. Although the small villages are marginalised, there should be activities to develop knowledge and entrepreneurship skills in villages within Lundu. Kampung Perdana and Kampung Lestari competitions are among programmes which encourage participations from villages.

Communications infrastructure and services need to be brought to the more isolated parts of this site. Overall, while there is good coverage, continuous improvements and upgrade are recommended.

KOTA BELUD

Similar to Lundu, Kota Belud is also in need of guided community programmes, especially basic ICT skills and entrepreneurship trainings. Communication networks need to be expanded to ensure coverage throughout the site. The related agencies and government departments need to further improve in terms of handling the flood issue. Flood Victims Settlement Centres must be ready and equipped with facilities and good digital support. Kota Belud needs sufficient financial aid from government and also the private sector.

KEMAMAN

In order to improve community lifestyle, Kemaman has to add more Internet Centres to enable public access and usage especially for the younger aged group. Libraries also could be the central places that permit people to utilise and use internet. Yayasan Pembangunan Usahawan (YPU) and local councils too could help to initiate community participations.

On the other hand, the location of the KOIL Training Centre may need to be reviewed as its current location is far from the main population. The ideal location could be Chukai as the demographic intensity and engagement there is higher and larger. A strategic location is important to encourage participation.

Development and infrastructure projects have to be continued. This would require attention not only from authorities such as government, local councils and educational institutions but also from telecommunication companies and agencies. For example, Telekom could roll out UNIFI access everywhere in the area.

A priority initiative should be a 'smart' flood alert device system along with a Water Level and Security Monitoring System and Alternative Communication Network. This would speed up the evacuation process and minimise losses.

Overall Recommendations based on 7 Principles of Smart Community

Overall, the data collected from this research suggested that the telecommunication infrastructure should cover not only the town areas but the entire area. This will result in the community making maximum use of the facilities and engaging in the activities provided by the smart community centres. Continuous initiatives are required, for example collaboration from MCMC, internet centres, telecommunications, post, libraries, health centres, flood relief centres and many others. The government should place emphasis on building solid infrastructure, with good town planning projects.

In addition to the above, respondents repeatedly said that smart community is all about empowerment and quality of life in terms of education, socio-economic and culture. Hence, more efforts to further increase the community's participation in events, workshops and programmes are recommended.

Infrastructure Improvement

Internet centres serve as very good enablers for development of a smart community especially in more rural areas because in addition to providing means of technology and internet access to the community, the centres function well in developing technological literacy among children and housewives. In this sense, internet centres should be continued and expanded to more localities. Apart from that, locations of such facilities need to be positioned at strategic locations to ensure public participation is appreciated.

In addition, planners should also look at other infrastructure such as electricity and water supply as there are some under-developed areas without basic utilities.

Local Content and Application Development

The deployment of community applications needs to be improved. The initial plan was to disseminate information through an application but this was not done. The justification was that the information required by the community is being broadcasted to them via other means such as WhatsApp communication or SMS. This lapse has to be overcome and based on our qualitative interview with stakeholders, the communities welcome the idea of self service through community applications, as the information-pull factor applies. In some instances, such as in Putrajaya, where there are great opportunities for the communities to embrace smart technologies, the push factor in extending more of the smart applications will further boost the adoption among the communities here.

Role of Local authorities, institutions and Local Influencers

Federal and state authorities should give full support to the smart community initiatives. Apart from that, public and private agencies should put their hands together to ensure this programme and initiatives are successfully implemented and sustainable in the long run as such collaboration with public and private agencies really help to improve existing initiatives. Higher education institutions in the respective areas can collaborate together. For example, Kemaman smart community project has collaborated with Universiti Technology Malaysia on an IoT related waste management project. Sponsorship for hardware might be required and experts from higher education institutions or individual experts could be engaged to develop software that can benefit the community. Local Influencers need to discuss and work closely with the implementors as well as establish good relationship with the local district officer. We found that local Influencers were not communicating with the district office and local community. This is very useful to help us to understand the respective research area. In most instances we visited a research area by ourselves and met with the respective district officer team. Other arrangements were made with the help of Pusat Internet Manager and community leaders.

Replicability and Sustainability of the Initiatives

Next to the cooperation of the various stakeholders, funding is another crucial component in ensuring sustainability of the smart community projects. Apart from funds from the government, more corporate sponsors can be approached. The smart community project can also be replicated to other locations within the country especially in the more rural and suburban localities given that the projects have demonstrably impacted the lives of people in many areas.

The following summarises some of the challenges that should also be overcome in order to ensure sustainability and replicability of the smart community projects:

* Lack of commitment from Local Influencers.
* Insufficient funding.
* Need for a clear management plan that encompasses all the strategic action plans.
* Lack of clear signage or direction.
* Lack of promotion of activities.
* Improvement of institutional collaborations across the flagship projects.
* The design of informal communication mediums about smart community that leverage mosques and other places of worship.
* Lack of active participation from the volunteers.
* Schools and institutions of higher learning must be involved in the smart community programmes.
* Need for a virtual 'suggestion box' platform to be developed and made known to the community.
* More inclusiveness for women and the elderly at Pusat Internet centres.

Monitoring the progress and achievement of smart community project

This can be done via the use of the index developed in this study that measures 4 important components (access and ownership, use-diffusion, impact, attitude). The Smart Community Index uses a modular approach whereby further criteria can be added should the need arise. The list of use-diffusion activities may vary a little depending on the initiatives set up according to the project location. Thus, once the project has gained some momentum, the current list of activities can be revised to include use-diffusion activities that reflect a more holistic use of ICTs.

CONCLUSION

The overall conclusions that can be derived based on the research conducted at the four sites are that the initiatives need to be continued and upgraded progressively. Some of the key recommendations include strengthening the infrastructure availability at the sites, extending IT resources to rural areas, ensuring homogeneous adoption and placement of the resources at the strategic location, and ensuring the initiatives are in line with the strategic development of the area to have better adoption that eventually improve the index score.

Most of the respondents agree that the smart community programmes should be continued with support from all – the government, private sector and the community itself. There were suggestions given by the respondents to ensure sustainability of 'smart community' initiatives. These include proper guidance from the experts and sufficient funds allocation. The smart community initiatives would be able to bridge the digital gap between the urban and rural areas. The current initiatives are in line with MCMC's directive to roll out more Smart Communities to other states, in order to make Malaysia become a Smart Nation in coming years.

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Preventive Intervention Programmes

for Problematic
Internet Behaviours

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ABSTRACT

Like any kind of progress, increasing dependence on the internet as an avenue for social interaction and entertainment has led to a host of problematic internet behaviours. These negative consequences are especially worrying among adolescents born in the digital age, many of which lack the necessary skills to responsibly maximise and regulate their use of the internet. This leads to the development of problematic internet behaviours such as excessive use of the internet, excessive online gaming, and online pornography viewing, among many others. This research sought to investigate the association between online gaming and online pornography viewing with social and psychological impact among adolescents. Secondly, it examined the effects of intervention programmes to prevent excessive and problematic internet use in relation to behavioural problems. This article shares evidence-based findings and strategies underpinned psychological approaches to sustain healthy and positive digital well-being among youths in Malaysia. To fulfil the research objectives, a national survey was conducted to collect prevalent data on online gaming and online sex/pornography viewing, as well as its social and psychological impacts among adolescents. In addition, two practical manuals have been developed for intervention programmes to prevent excessive and problematic internet use in relation to behavioural problems. These manuals target problematic/excessive online gaming, problematic/excessive online sex/pornography viewing, and family systems support. The main findings of this research project indicate moderate to high positive correlations between problematic online gaming and aggression, as well as moderate to high positive correlations between adolescent well-being and perceived social support. Other than that, the effectiveness of the developed Psychological Intervention Programme – Excessive Online Gaming for Youth (PIP-OG-Y) was shown by significant decreases in levels of problematic online gaming at the end of the programme. Effectiveness of Psychological Intervention Programme – Online Pornography Viewing for Youth (PIP-OP-Y) was also shown through significant decreases in levels of online pornography viewing and significant increases in levels of adolescent well-being and perceived social support. Taken together, the findings showed efficacy of the developed programmes in ameliorating symptoms of online gaming and online pornography viewing.

INTRODUCTION

The internet has become an essential part of an individual's life, from facilitating the research and information seeking process, to enabling interpersonal communication and global business transactions. For adolescents and students, the internet is seen as a source of knowledge and entertainment, and a platform to share information with their peers easily. This ease in access has also encouraged the development of high-risk behaviours (HRB) amongst adolescents, such as problematic online gaming and online pornography viewing.

Development of HRB amongst adolescents has the potential of negatively affecting their psychosocial and physiological well-being in the present and future (De Guzman & Bosch, 2013; Faeh, Viswanathan, Chiolero, Warren, & Bovet, 2006). These behaviours include problematic internet use (PIU), problematic online gaming, and even problematic online pornography viewing (Mak et al., 2014; Ke & Wong, 2017; Peter & Valkenburg, 2016). Such behaviours do not occur in isolation, and the problem-behaviour theory postulates that adolescents who engage in a form of risky behaviour are more likely to engage in other behaviours of the similar nature (Rew, 2005). For instance, evidence suggests that PIU and problematic online gaming often occur simultaneously due to their shared underlying determinants. As such, a comprehensive national database among adolescents needs to be compiled for related government agencies to set up appropriate plans and policies to manage these issues.

LITERATURE REVIEW

Online Gaming

In 2013, the Internet Gaming Disorder was included in the American Psychiatric Association's 5th Diagnostic and Statistical Manual of Mental Disorders (DSM-5; APA, 2013), illustrating societal concerns towards the online gaming phenomenon. In particular, concerns stem from the introduction of games containing violent features and the negative effects that might arise from the excessive playing of these games. Video games containing violent features have been shown to sell better than games without violent features (Anderson, Gentile, & Buckley, 2007).

Numerous research have shown a link between gaming and negative effects on the players of games. Effects include physiological arousal, increased aggressive behaviour and thoughts, and less positive behaviour (Anderson & Bushman, 2001; Anderson et al., 2007; Anderson et al., 2010). Other consequential effects of playing online games are such as reducing the time for sleep, work or education, sports and exercise, and socialising (Griffiths, Davies, & Chappell, 2004; Henchoz et al., 2016).

On the other hand, a number of studies find no association between gaming and negative effects such as aggression. Hence, researchers have resorted to physiological measures instead of self-reported behaviour. Neuroimaging studies have found differences in the brains of individuals who engage in problematic gaming (Kuss & Griffiths, 2012; Pontes, Kuss, & Griffiths, 2017).

Online Pornography Viewing

In a Malaysian context, research on HRBs often conceptualise several behaviours into a broad category (Ching et al., 2017; Farid et al., 2016; Jafarkarimi, Sim, Saadatdoost, & Hee, 2015). It is uncommon for problematic online pornography viewing – a HRB that is a subtype of PIU – to be studied independently. The National Council of Women's Organisations Malaysia (NCWO) suggest that the increase in accessibility to online pornography has contributed to the increasing number of child rape cases in Malaysia. This view is further supported by the national increase in rape cases that has coincided with the internet boom.

Evidence suggests that online pornography viewing not only arouses an individual but encourages the exhibition of sexually risky behaviour (Luder et al., 2011). With excessive online pornography viewing, an adolescent's sexual development is harmed (Braun-Courville & Rojas, 2009), and socially undesirable outcomes such as unwanted teenage pregnancies and sexual aggression increase (Chang et al., 2016; Sabina, Wolak & Finkelhor, 2008; Ybarra & Mitchell, 2005).

METHODOLOGY

National Survey

The national survey primarily focused on exploring the national prevalence of online gaming and online pornography viewing behaviour among Malaysian adolescents and its association with aggression, adolescent well-being and perceived social support.

i. **Survey Questionnaires**

For the online pornography survey, the three questionnaires employed were the adapted Online Pornography Screening (OPS), the EPOCH Measure of Adolescent Well-Being (EPOCH; Kern, Benson, Steinberg, & Steinberg, 2016), and the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988). All the questionnaires were translated into Bahasa Malaysia as requested by the Malaysian Ministry of Education.

For the online gaming survey, the four questionnaires employed were the Problematic Online Gaming Questionnaire (POGQ; Demetrovics et al., 2012), the Buss-Perry Aggression Questionnaire (BPAQ; Buss & Perry, 1992), the EPOCH Measure of Adolescent Well-Being (EPOCH; Kern et al., 2016), and the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al, 1988).

ii. Participants and Recruitment

A multi-site request for voluntary participation was initiated in various government secondary schools in all sixteen states and federal territories. A total of 599 participants completed the online gaming questionnaire, while 551 participants completed the online pornography questionnaire.

Preventive Intervention Programme

A single subject experimental design was adopted to test the efficacy of the intervention programmes for online gaming and online pornography viewing. The Psychological Intervention Programme – Excessive Online Gaming for Youth (PIP-OG-Y) and Psychological Intervention Programme – Online Pornography Viewing for Youth (PIP-OP-Y) are intervention programmes that integrate Cognitive Behavioural Therapy (CBT) and positive psychology in an attempt to promote healthier internet use. CBT is an established psychotherapy technique that attributes the existence of problems to thought processes and their related behaviours (Nelson-Jones, 2001).

i. Questionnaires

For the online gaming group, the questionnaires employed were the Problematic Online Gaming Questionnaire (POGQ; Demetrovics et al. 2012), the Buss-Perry Aggression Questionnaire (BPAQ; Buss & Perry, 1992), the EPOCH Measure of Adolescent Well-Being (EPOCH; Kern et al., 2016), and the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al, 1988).

For the online pornography viewing group, the three questionnaires employed were the Online Pornography Screening (OPS), the EPOCH Measure of Adolescent Well-Being (EPOCH; Kern et al., 2016), and the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al, 1988).

ii. Participants and Recruitment

Participants were recruited through a nationwide multi-site recruitment in various government secondary schools across Malaysia.

A total of 85 students participated in the online gaming study and 133 students participated in the online pornography viewing study. All participants were selected based on their initial questionnaire scores, where participants in the problematic or near-problematic range were given priority to participate.

iii. Procedures

The study consisted of three phases – pre-intervention, intervention, and post-intervention (refer to Table 1). At pre-intervention, all participants completed the respective questionnaires for the first time (T_1 or pre-intervention) to collect baseline data. After that, the online gaming and online pornography viewing intervention programmes were conducted with the respective group of participants during the intervention phase by trained, registered school counsellors. The sessions were 60 minutes long and conducted either weekly or biweekly, depending on availability of the students and counsellors. At the end of the last session of the programme, all participants completed the same set of questionnaires (T_2 or post-intervention). In the following four weeks, all participants went about their regular daily activities. At the end of the fourth week of post-intervention, questionnaires were administered for the third and final time (T_3 or follow-up) to measure maintenance effects.

Table 1: Timeline and weekly topics of the intervention programmes

Design	Week	Timeline	Activity/Topic
Pre-intervention	1	Baseline (T_1)	Pre-study briefing Administration of questionnaire
Intervention (60-minute weekly CBT intervention session)	2	Session 1	Ice Breaking/Sharing
	3	Session 2	How You React to Anxiety and Stress
	4	Session 3	'Thought-Emotion-Action' (TEA)
	5	Session 4	Positive Emotions and Support System
	6	Session 5	Angel-Devil Thoughts
	7	Session 6	Strengths and Emotional Intelligence
	8	Session 7	The Flying Rocket: Achieving Goals
	9	Session 8	A New Journey
		(T_2)	Administration of questionnaire
Post-intervention	10 - 13	Integration period	Participants integrate knowledge into daily practice
	13	(T_3)	Administration of questionnaire

FINDINGS

National Survey

i.   Gender distribution
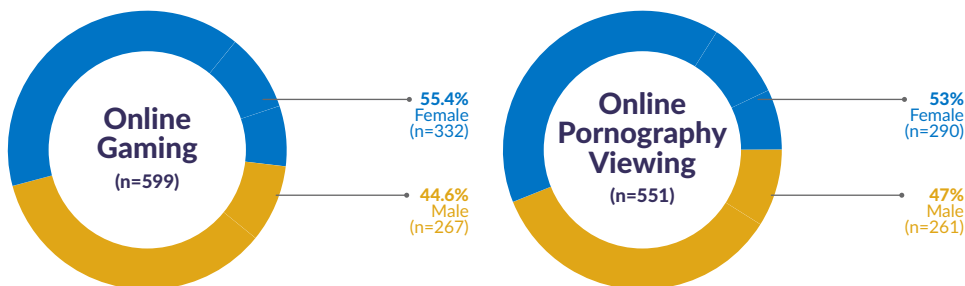
Figure 1: Participants distribution according to gender

ii.   Ethnicity distribution
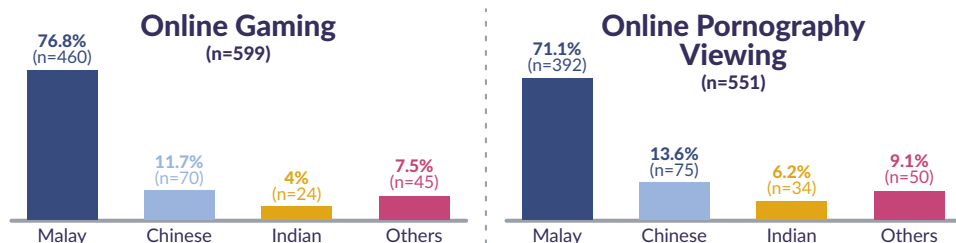
Figure 2: Participants distribution according to ethnicity

iii.   Participant distribution according to the age first started playing online games and first started viewing online pornography
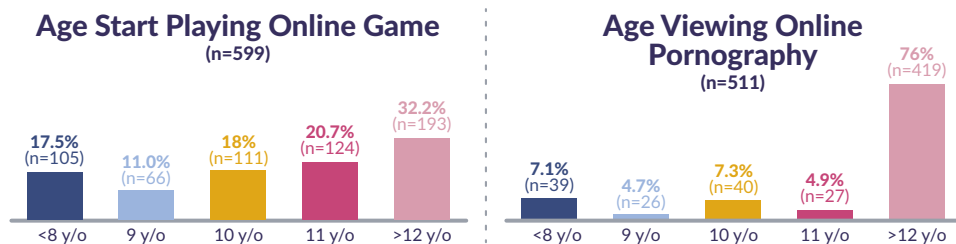
Figure 3: Participant distribution based on age they first started playing online game and viewing online pornography

iv. Participant distribution according to average weekly hours playing online games and viewing online pornography
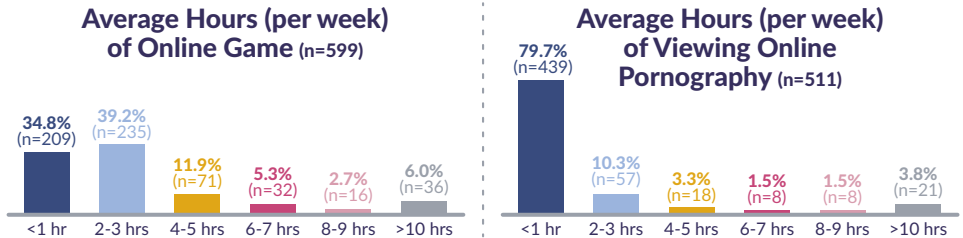
Figure 4: Participants distribution according to weekly hours spent doing the two activities

v. Participant distribution according to POGQ, BPAQ, EPOCH & MSPSS (Online Gaming)
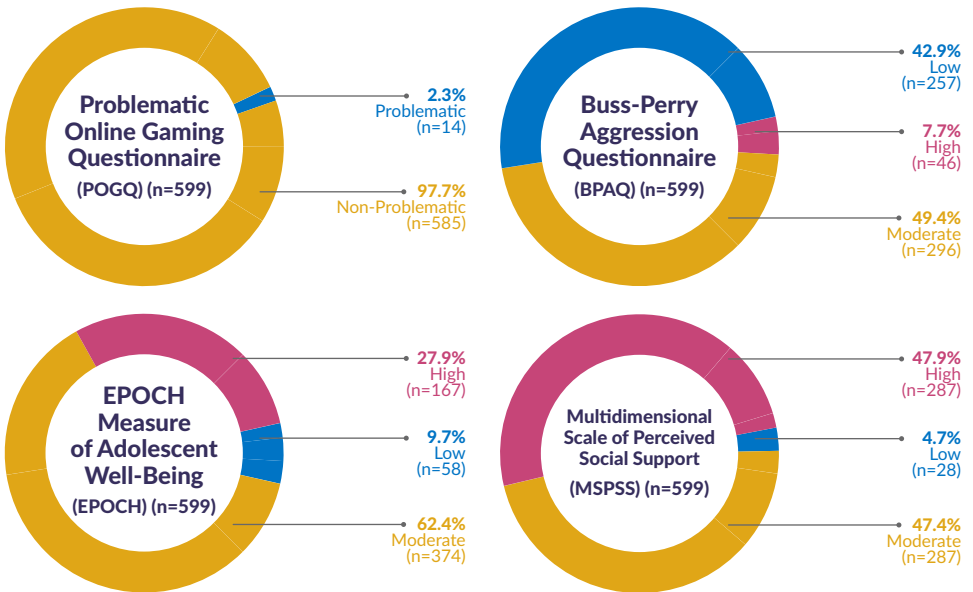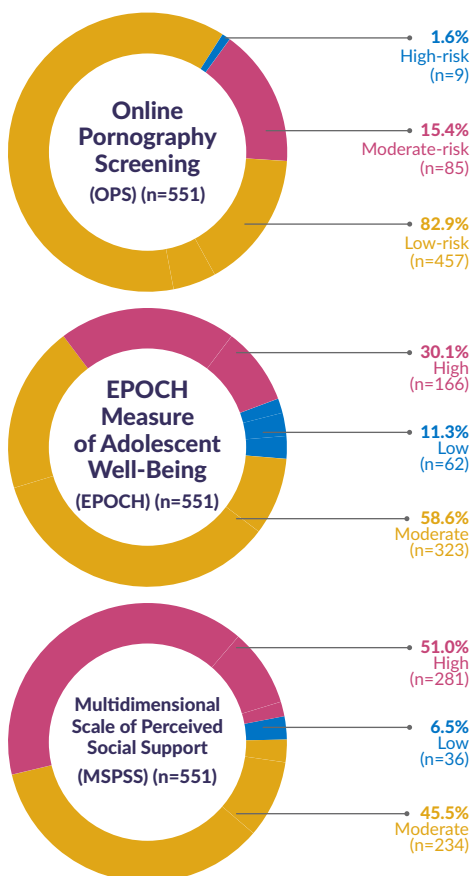

Figure 5: Participants distribution according to POGQ, BPAQ, EPOCH & MSPSS

Prior to further data analysis, all questionnaires (i.e. POGQ, BPAQ, EPOCH, MSPSS) were tested for reliability (Table 2). The results revealed Cronbach α-values above .9, exceeding the satisfactory recommendation of .8 (Howitt & Cramer, 2008).

Table 2: Correlation and reliability analysis of POGQ, BPAQ, EPOCH, and MSPSS

Correlations				
	1	2	3	4
1. POGQ	-			
2. BPAQ	.468**	-		
3. EPOCH	.01	.04	-	
4. MSPSS	-.080*	-.097*	.612**	-
α-values	.92	.91	.92	.93

*p < .05, **p < .01

Results indicated that approximately 98 percent of the participants were from the normal category of online gaming behaviour, indicating that the participants would be less likely to develop a problem with their online gaming behaviour. Despite most participants being in the normal category of online gaming behaviour, correlational analysis identified significant correlations between online gaming behaviour and aggression.

A correlational analysis was conducted based on participant scores (refer to Table 2). The results indicate a significant positive relationship between problematic online gaming and aggression (r = .47, p < .001). This suggests that individuals with higher levels of problematic online gaming have higher aggression levels. There was also a significant negative relationship between problematic online gaming and social support (r = -.08, p < .05). This suggests that individuals with higher level of problematic gaming have lower levels of social support.

A significant negative relationship was also observed between aggression and social support (r = -.10, p < .05). This suggests that individuals with higher levels of aggression have lower levels of social support.

A significant positive relationship was observed between adolescent well-being and social support (r = .61, p < .01). This suggested that individuals with higher levels of adolescent well-being have higher levels of social support.

vi. Participant distribution according to OPS, EPOCH & MSPSS (Online Pornography Viewing)

Online Pornography Screening (OPS) (n=551)
- 1.6% High-risk (n=9)
- 15.4% Moderate-risk (n=85)
- 82.9% Low-risk (n=457)

EPOCH Measure of Adolescent Well-Being (EPOCH) (n=551)
- 30.1% High (n=166)
- 11.3% Low (n=62)
- 58.6% Moderate (n=323)

Multidimensional Scale of Perceived Social Support (MSPSS) (n=551)
- 51.0% High (n=281)
- 6.5% Low (n=36)
- 45.5% Moderate (n=234)

Figure 6: Participants distribution according to OPS, EPOCH & MSPSS

Prior to further data analysis, all questionnaires (i.e. OPS, EPOCH, MSPSS) were tested for reliability (refer to Table 3). The results revealed Cronbach α-values above 0.9, exceeding the satisfactory recommendation of 0.8 (Howitt & Cramer, 2008).

Table 3: Correlation and reliability analysis of OPS, EPOCH, and MSPSS

Correlations			
	1	2	3
1. OPS	-		
2. EPOCH	.008	-	
3. MSPSS	.001	.574**	-
α-values	.91	.95	.96

*$p < .05$, **$p < .01$*

Results indicated that approximately 83 percent of the participants were of the low-risk category, indicating that the participants may or may not have a problem with their online pornography viewing behaviour.

A correlational analysis was conducted based on participant scores (refer to Table 3). The results indicate that there was no correlation between online pornography viewing with adolescent well-being or social support. This suggests that no further analysis was required between online pornography and the other variables.

However, there was a significant positive relationship between adolescent well-being and social support ($r = 0.57$, $p < 0.001$). This suggests that individuals with higher levels of well-being have higher levels of social support.

These results indicate that Malaysian adolescents are not at a high-risk of developing problematic online gaming or online pornography viewing behaviour. While most participants are considered low-risk, the significant positive relationship between the observed variables provides implications that are worth noting.

Preventive Intervention Programme

i. Demographic data (Online Gaming)

Gender

10.6% Female (n=9)

89.4% Male (n=76)

Age (years)

11.8% (n=10) — 13 y/o

37.6% (n=32) — 14 y/o

3.5% (n=3) — 15 y/o

47.1% (n=40) — 16 y/o
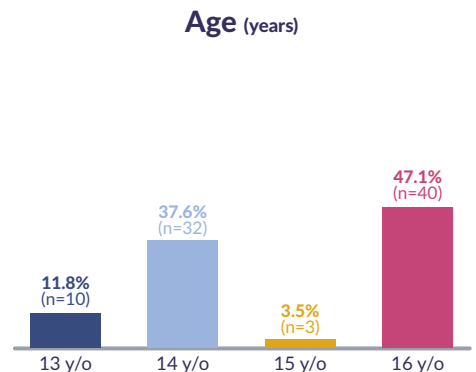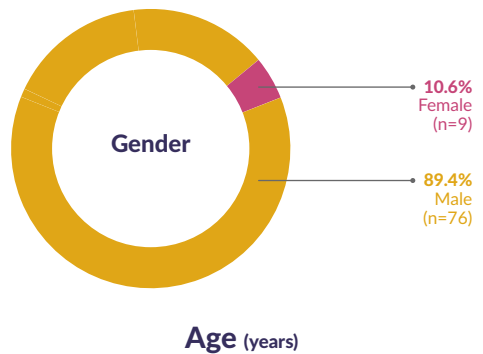
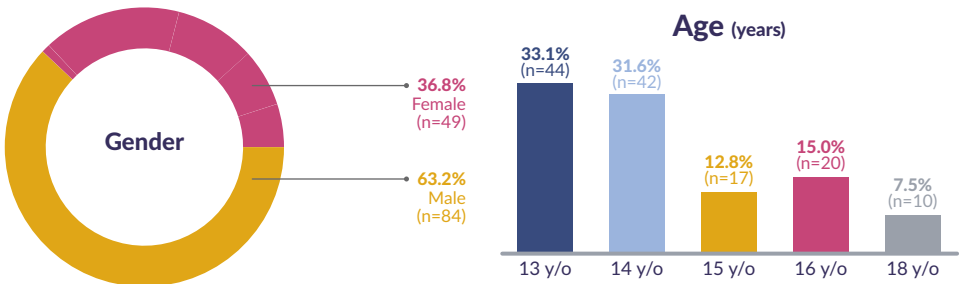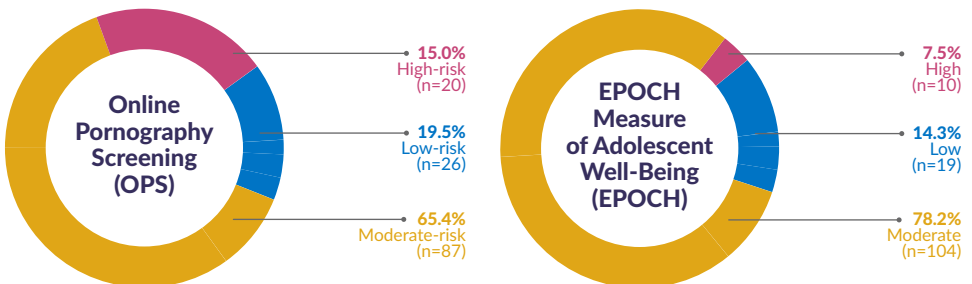*Figure 7: Participants distribution according to gender and age for online gaming section*

ii. Online gaming questionnaire results (POGQ, BPAQ, EPOCH & MSPSS)

Problematic Online Gaming Questionnaire (POGQ)
- 35.3% Problematic (n=30)
- 64.7% Non-Problematic (n=55)

Buss-Perry Aggression Questionnaire (BPAQ)
- 22.4% Low (n=19)
- 17.6% High (n=15)
- 60.0% Moderate (n=51)

EPOCH Measure of Adolescent Well-Being (EPOCH)
- 35.3% High (n=30)
- 2.4% Low (n=2)
- 62.4% Moderate (n=53)

Multidimensional Scale of Perceived Social Support (MSPSS)
- 41.2% High (n=35)
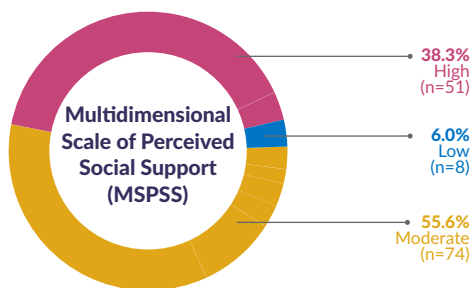- 9.4% Low (n=8)
- 49.4% Moderate (n=42)
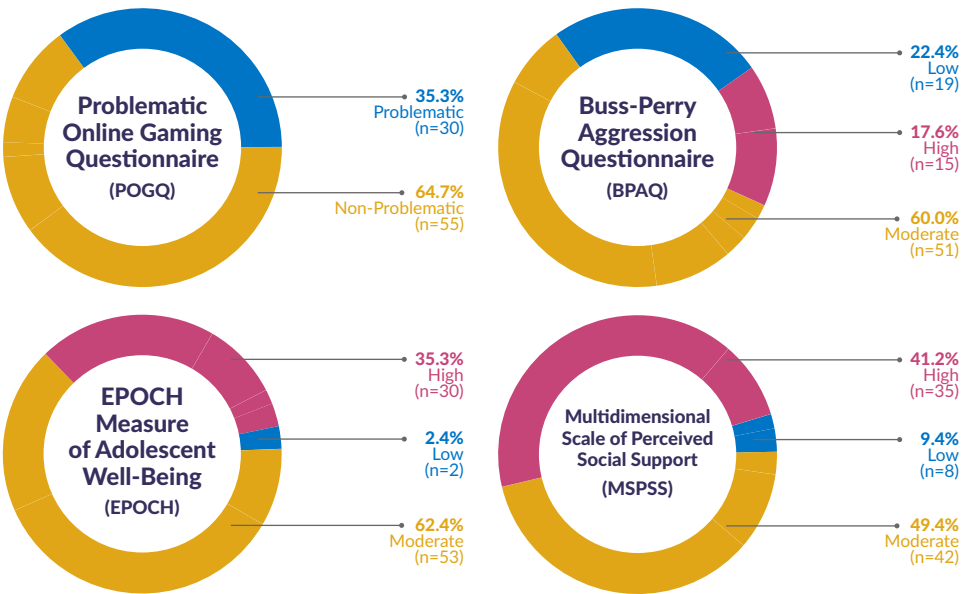
Figure 8: Participants distribution according to POGQ, BPAQ, EPOCH & MSPSS

Correlation analyses were conducted to investigate the relationship between variables (refer to Table 4). Analyses of the variables at pre-intervention indicate a high positive correlation between problematic online gaming and aggression (r = .422, p < .001), adolescent well-being (r = .335, p < .01), and perceived social support (r = .246, p < .05). This indicates that participants with high problematic online gaming levels had high aggression, well-being and perceived social support levels, and vice versa. Besides that, a high positive correlation was shown between aggression and adolescent well-being (r = .468, p < .001), indicating that participants with high aggression had high adolescent well-being, and vice versa. A high positive correlation was also shown between

adolescent well-being and perceived social support (r = .615, p < .001), indicating that participants with high adolescent well-being had high perceived social support, and vice versa.

Table 4: Correlation analysis of POGQ, BPAQ, EPOCH, and MSPSS at pre-intervention (T_1)

Correlations				
	1	2	3	4
1. POGQ	-			
2. BPAQ	.422**	-		
3. EPOCH	.335**	.468**	-	
4. MSPSS	.246*	.128	.615**	-

*p < .05, **p < .01*

Paired t-tests were used to observe the effectiveness of the PIP-OG-Y (refer to Table 5). Participant scores for problematic online gaming decreased significantly at all time points. Scores for aggression, adolescent well-being and perceived social support also decreased significantly from pre- to post-intervention, and from pre-intervention to follow-up.

Table 5: Summary of t-tests

Variables	T_1 (Pre-intervention)		T_2 (Post-intervention)		T_3 (Follow-up)		t-test		
	M	SD	M	SD	M	SD	T_1 - T_2	T_2 - T_3	T_1 - T_3
POGQ	58.87	12.27	51.79	11.23	45.19	10.30	4.65**	5.03**	8.22**
BPAQ	86.02	22.10	77.09	18.85	72.68	17.99	3.02**	1.93	5.14**
EPOCH	3.45	0.75	3.18	0.57	3.16	0.71	3.05**	0.26	2.91**
MSPSS	4.80	1.27	4.45	1.32	4.41	1.37	2.34*	0.28	2.60*

Note. M = mean; SD = standard deviation
*$p < .05$, **$p < .01$

iii. Demographic data (Online Pornography Viewing)

Figure 9: Participants distribution according to gender and age for online pornography viewing section

iv. Online pornography viewing questionnaire results (OPS, EPOCH & MSPSS)

Figure 10: Participants distribution according to OPS, EPOCH & MSPSS

Multidimensional Scale of Perceived Social Support (MSPSS)

38.3% High (n=51)

6.0% Low (n=8)

55.6% Moderate (n=74)

Correlation analyses were conducted to investigate the relationship between variables (refer to Table 6). Analyses of the variables at pre-intervention indicate a high negative correlation between online pornography viewing and perceived social support (r = -.320, p < .001). This indicates that participants with high levels of online pornography viewing have low levels of perceived social support, and vice versa. A high positive correlation was also shown between adolescent well-being and perceived social support (r = .458, p < .001), indicating that participants with high adolescent well-being had high perceived social support, and vice versa. A negative correlation was shown between online pornography viewing and adolescent well-being, although not statistically significant.

Table 6: Correlation analysis of OPS, EPOCH, and MSPSS at pre-intervention (T_1)

Correlations			
	1	2	3
1. OPS	-		
2. EPOCH	-.074	-	
3. MSPSS	-.320**	.458**	-

*p < .05, **p < .01*

Table 7: Summary of t-tests

Variables	T_1 (Pre-intervention)		T_2 (Post-intervention)		T_3 (Follow-up)		t-test		
	M	SD	M	SD	M	SD	T_1 - T_2	T_2 - T_3	T_1 - T_3
OPS	12.58	5.76	9.97	5.69	7.86	5.48	4.17**	5.26**	7.31**
EPOCH	2.98	0.58	3.23	0.73	3.32	0.73	-3.68**	-1.61	-4.64**
MSPSS	4.67	1.06	4.91	1.06	5.03	1.07	-2.19*	-1.45	-2.96**

Note. M = mean; SD = standard deviation
*p < .05, **p < .01*

DISCUSSION

The national prevalence survey carried out as part of this research has shown that 2.3 percent of Malaysian youths are at risk of problematic online gaming, while 1.6 percent of Malaysian youths are at high-risk categories for online pornography viewing. Despite most participants being in the normal category of online gaming behaviour, correlational analysis identified significant correlations between online gaming behaviour and aggression. It can be inferred that adolescents with problematic levels of online gaming behaviour have a higher likelihood of being aggressive. These results support previous findings that adolescents who engage in online gaming behaviour typically exhibit aggressive traits (Kim, Namkoong, Ku & Kim, 2008; Mehroof & Griffiths, 2010; Teng, Li & Liu, 2014). This behaviour would be problematic in the future, as prolonged periods of online gaming can result in the strengthening of aggressive behaviour and lower self-control (McInroy & Mishna, 2017), and lead to the development of online gaming addiction (also known as Internet Gaming Addiction, as defined by the DSM). Not only would this inhibit the healthy development of an adolescent but fosters an unhealthy cyber culture that would have detrimental societal effects.

Correlational analysis identified no significant correlations between online pornography viewing and its associated variables of adolescent well-being and social support. Adolescents who have problematic levels of online pornography viewing have a high capacity to become engaged in the activity. This behaviour would be problematic in the future, as the increased exposure of

adolescents to sexually explicit material can result in the strengthening of sex-related cognitions in memory and the exclusion of other thoughts (Peter & Valkenburg, 2008). However, as no significant correlations were discovered, the researchers concluded that no further analysis was required.

In terms of results of programme effectiveness, both problematic symptoms of problematic online gaming and aggression exhibited significant improvements after intervention sessions. This indicates that the PIP-OG-Y was effective in ameliorating problematic symptoms. Previous research has studied a similar CBT-based intervention programme for problematic online use, revealing a significant reduction in problematic internet use symptoms at all time points (Ke & Wong, 2018a; Ke & Wong, 2018b). These encouraging findings support the efficacy of the elements of the programme in targeting problematic online gaming behaviour. In contrast, symptoms of adolescent well-being and perceived

social support significantly decreased after the intervention programme. As previously suggested by the correlation findings, this may be a result of responding to these attributes in relation to their online gaming activities, and the link between their well-being and perceived social support with the virtual gaming world they partake in. Hence, as the participants' online gaming activities decrease after the intervention, their self-reported EPOCH and MSPSS scores naturally decrease as well. The linking of their daily lives to the virtual world through online gaming activities indicate a notable integration between the real and virtual world. Hence, more intensive sessions targeting elements of well-being and social support may need to be included in the developed programme to produce observable changes in these more covert attributes.

Online pornography viewing symptoms reduced after the intervention sessions, while adolescent well-being and perceived social support increased. This indicates that the PIP-OP-Y was highly effective in ameliorating problematic symptoms, as well as improving desirable traits of adolescent well-being and perceived social support. Previous research showed comparable results for a similar CBT-based intervention programme for problematic internet use (Ke & Wong, 2018a; Ke & Wong, 2018b).

In contrast to findings in the online gaming group, the PIP-OP-Y programme showed efficacy in boosting well-being and perceived social support. Online pornography viewing behaviour is regarded as a despicable act which is frowned upon in our highly collectivistic society due to ethical, moral, and religious reasons, while online gaming behaviour has been normalised over the years. As a result, online pornography viewing participants feel guilty and sinful for indulging in the activity, as observed from

the previous focus group interviews we conducted. We posit that our findings show more apparent observable changes when the programme is applied to online pornography viewing behaviour because elements of the programme are more easily absorbed by the participants who have a higher tendency to be motivated to change, particularly for covert attributes such as adolescent well-being and perceived social support.

CONCLUSION

In conclusion, the study suggested that the incidence of problematic online gaming and problematic online pornography viewing is low among Malaysian adolescents. This, however, does not negate the importance of dealing with these problematic behaviours among those who are at moderate or high risk. Additionally, it is important to recognise the importance of the relationship between problematic online gaming with aggression and perceived social support, as well as adolescent well-being and perceived social support.

The PIP-OG-Y intervention programme was effective in ameliorating symptoms of problematic online gaming and aggression, while the PIP-OP-Y was revealed to be highly effective in improving symptoms of online pornography viewing, adolescent well-being, and perceived social support. In light of the rising popularity of online gaming, effective preventive measures such as the developed PIP-OG-Y and PIP-OP-Y become essential in order to cultivate a healthy cyber culture in our youth.

We recommend future studies to further validate the psychological intervention programmes by comparing the effects on a control group. This would require high participation from students nationwide and would allow better understanding of the efficacy of the intervention programmes.

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The New Media and the Consciousness of History in Malaysia:

Ideas on National History and Other Histories
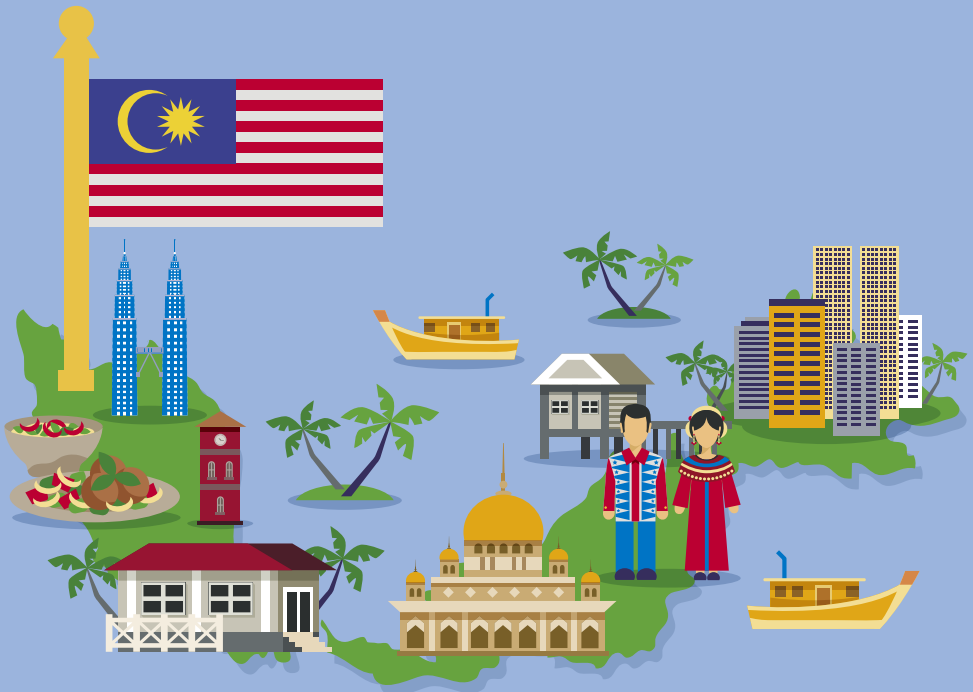
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ABSTRACT

This study delved into how the narrative of the nation's history has been fragmented by new media. This assumption was based on the appearance of blogs, online newspapers and other online materials appearing in the decade leading up to the new millennium. Some of these and other online materials later made their way into books published mainly by non-mainstream institutions. What it demonstrated is that new narratives about the nation were revealed through online technology. This study was significant in that it uncovers the consciousness of history among Malaysians and the ethnicization of the nation's history. There are also strong sentiments resisting national history from the regions of Sabah and Sarawak. Hence, there was a need to be cognisant of and understand the emergence of the different perspectives based on ethnicity and the region. The study was carried out through four approaches, namely, the study of the narrative over the years, a nationwide questionnaire and focus groups, as well as interviewing parties who may have an oversight on the direction of the nation. There seemed to be a connection between the consciousness of the nation's history, the new media and the democratisation of media and history. Over a period of almost two decades in Malaysia, we saw a contestation of the nation's history through different and counter narratives.

Keywords: Nation's history, Consciousness of history, Democratisation of Malaysian History

INTRODUCTION

The Malayan Communist Party as villains turned heroes, Parameswara's religious faith during his lifetime, and Hang Tuah's ethnicity have all been fertile grounds for a re-examination of the nation's past by its multi-constituent and plural population. The representation of Malaysia's history over the last two decades have been viewed by some as problematic, and what has been accepted as received knowledge has also been a matter of contention. The pluralist society comprising the Malays, Chinese, Indian, Orang Asal, indigenous groups and other Bumiputera groups in Malaysia would be suggestive of such a contestation, with each ethnic group possessing their own history, traditions and world views. Bearing in mind the emerging contested narratives, it is imperative for society and the present generation to understand the many perspectives.

The history of Malaysia was "never neat" (Matheson-Hooker, 2003), as various versions and perspectives on the nations were presented, re-represented to and consumed by the public. The growing interest in the passing of historical knowledge had created new dimensions of knowledge of the past. Historically, Malaya was earlier colonised by the Portuguese in 1511, followed by the Dutch in 1641 and then by the British in 1874. Malaya was under British rule for more than 150 years and continued to be a member of the Commonwealth (Andaya & Andaya, 2001).

Unlike the Portuguese and the Dutch who were only interested in monopolising trade, the British subscribed to Divide et impera or "divide and rule" policy, thus shaping the history of Malaysia as they altered the shape, ethnic, and religious pluralism based on their policy. The existing plural society turned into a culture divided along labour lines. According to social anthropologist, Zawawi Ibrahim, "it was the subsequent elaborations by colonialism upon this 'initial pluralism' (pre-colonial pluralism) which gave rise to the ethnicism and competing ethnicities currently inherited by the modern Malaysian nation-state" (1997: p. 116). In the British Era, different ethnic groups were not allowed to intermingle with each other and instead remained mainly within their own ethnic spheres.

According to Hefner (2001) labour was aggregated according to racial divisions: with the Malays in agriculture and those having received formal educations in government service; the Chinese dominating trade and industry; and the Indians (specifically the Tamil and other Dravidian groups) were employed within the plantation sector. The policy introduced by the British was to benefit themselves and not society. The British only created a symbolically plural society, which caused each ethnic group to identify itself with its motherland. The "divide and rule" policy caused all the ethnic groups to freely practise their respective faiths. The Sultans acted as the symbolic rulers of the Malay states and protectors of Islam. Their role was to ensure that Malay culture and the religion of Islam were not disparaged in the midst of this influx of other cultures and religions.

However, no socio-economic protective measures were introduced then to help the Malays compete with the thriving Chinese-dominated merchant community who had already established a network of capital and credit through their connections with different Chinese associations and chambers of commerce which were already established from as early as 1906 (Heng, 1996, p. 55). The pluralist society created and cemented by the British continued and passed over into a newly independent Malaya in 1957. The British surrendered their sovereignty over Malaya and the peninsula became independent that year with the name 'Federation of Malaya' or "Persekutuan Tanah Melayu". Later Malaysia was created in 1963 with Singapore, Sarawak and Sabah entering into the federation and creating the renamed "Federation of Malaysia."

In May 1969, racial clashes changed the national landscape, and the zeitgeist of the nation. National society was restructured – there was a reboot, especially in the socio-economic sector. Political and cultural rearrangements were executed with a new world view on nation-building – a twin-pronged policy of eradicating poverty and facilitating economic equity towards ensuring national unity in the restructuring of society was pursued. This was the New Economic Policy (NEP), an affirmative action based policy aimed at eradicating poverty among the Malays (R. W Hefner, 2001).

The NEP was one of the measures adopted by the government to achieve the objective of national unity to prevent clashes and violence among the ethnic groups (Milne, 1976). The NEP was the 'mother' of all public policies in Malaysia. Its effects are still felt and seen even after 30 years after the NEP 'expired' in the formal sense. The framework of the NEP re-established public policies on culture and education.

The end of the Cold War (roughly coinciding with the end of the NEP program) again affected the Malaysian political and intellectual landscape. The end of insurgency of the Communist Party of Malaya marked by the signing of the Peace Agreement of Hat Yai in 1989, and the dissolution of the Soviet Union that marked the end of the Cold War brought about an easing of control on proscribed publications related to communism. However, while these books have been and continue to be banned in Malaysia, they are somehow celebrated by certain segments in Malaysia. This coincided with increased access to the internet which facilitated the ease of production and the reproduction of views and opinions.

There was a new sense of liberalism. At the same time, ethno-centrism re-emerged in many ways. Entrenched identities manifested their avatars through many platforms. Hence what had been arguably accepted as a Malay-centric view now had competitors in the likes of emerging ethno-centric representations based on the different perspectives and world-views. Depictions represented in school history textbooks and a number of history and historiographical writings since independence is now subject to contestation.

Selected Major Sources

From the last few years of the 1990s and well into the 2000s, the nation has been overwhelmed by many histories, or rather, many perspectives. Many laid claim to nation building and nationhood. The previously Malay, and UMNO-centric perspectives were now complemented with Chinese, Tamil, Islamic, PAS, DAP, Istana, Iban, Kadazan, Thai, etc –centric history of Malaysia. These were in effect competing perspectives.

Initiatives and books by the Chinese community in laying claim to participation and contribution to Malaya's economic and social development represent a Chinese perspective. The Chinese educationist movement Dong Zong is a manifestation of such a perspective. Books in the likes of the *Chinese Dilemma*[1], and The Malaysian Chinese and Nation-building: Before Merdeka and *Fifty Years After*[2] appeared in the market.

A similar perspective can be said with regard to HINDRAF (Hindu Rights Action Force). Subsequent to HINDRAF capturing the national consciousness, numerous books on the Indians in Malaysia were published in the likes of The Problems of the Tamils, Indians in Malaysia which emerged following the 2007 HINDRAF rally.

Arising from such developments, criticisms were made accusing the Malaysian government through the Ministry of Education of being biased in the portrayal of history in school textbooks. The books were said to be skewed towards Malay and Islamic civilisation giving scant attention towards other civilisations such as Buddhism and Hinduism which also helped shape and influence the nation's history.

As these issues penetrated the national consciousness, narratives revisiting and re-engaging the notion of a social contract also began to reappear. Within the online space, the spate of insensitive ethnic comments implies a poor knowledge of the nation's history. Many blame the school system, with some calling for the reintroduction of History or the Social Contract as subjects, or a component in History to solve the problem of national unity. Can Social Contract be part of the subject of History and should History be a stand-alone subject through primary and secondary schools? If so, should History be made a compulsory subject from primary school to the university? Are we missing something here? The consumption of history at the popular level is of utmost critical importance. And it is at this level - through popular periodicals, the mass media, and the new media– that the different communities would see its representation, misrepresentation or under- representation. What all this means is that even, and especially for a nation like Malaysia, there may not be one history but many histories.

In reality, the process of community development - how society becomes systemised into the political, economic, and social realms of Malaysian society - was based on contributions from the past. It has been argued that each ethnic group contributes to the sub-story of historiography generic. But then, how would the historical presence of the ethnic groups be measured, viz the context of Malaysia and the origins of nation and nationhood? Arguments asserting on factuality, equality and justice appear in the discourse.

This study delves on the many histories consumed by the Malaysian publics. It is based on the premise that historical knowledge of the nation is ethnicized. From the 1990s onwards and into the next two decades, Malaysia's mainstream history has

1 Ye Lin-Sheng, Coronet Books Inc (2003)
2 edited by Voon Phin Keong, Kuala Lumpur: Centre for Malaysian Chinese Studies, 2007

been challenged, subverted, undermined and threatened. This study is aware that there is no official version of history of the nation and what has come to be known as the nation's history has grown and evolved, transcending sites and critical junctures over space and time, culminating in a point where a version has been accepted as mainstream history of Malaysia.

The representation of ideas, event and personalities by the discourse produced by historians, colonial administrator-scholars, as well as court scribes, with each informing the other has been quite stable until the advent of certain idea and events in the 1990s. Two critical events in particular are the collapse of the Berlin Wall spelling the end of the Cold War in 1990, and the other, the social use of information communication technologies in the mid 1990s. The former ideology, and the other technology.

THEORETICAL AND CONCEPTUAL PERSPECTIVES

A Concept of Public Spheres

It is instructive to structure the concept of public sphere, or its equivalent meaning. Castell calls this public sphere the 'Fifth Estate'. He conceptualises the latter as the depiction of the internet as the 'space of flows' instead of the 'space of spaces' (2007). Habermas on the other hand, theorises the public sphere as emancipation from oligarchic entities (1989). Stretching that concept is framing it to some selected aspects of perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation (Entman, 1993, p. 5). The technical form, as in the case of the internet, that has made possible a variety of platforms, has allowed the capabilities of reproduction. This is a significant premise of the present study.

A Concept of Reproduction

'Reproduction' is defined as the capacity to allow for the reproduction of multiple copies of a symbolic form (Thompson, 1995, p.20). In terms of ideas on national history, the study captures its reproduction and 'its flows' from one 'recipient' to another. Its structures in the public sphere had begun to emerge in Malaysia in early 2000 and hence been a dominant ideology. It is under this dominant ideology where the reproduction of 'original works and ideas' has authenticity to it: with 'copies' of the 'original' possessing a virulency in disturbing the relationships of power. The study queries what Foucault (1989) terms as the metaphor of the panopticon, drawing the link between knowledge, technology and power. Thus exploring the relationship between a system of social control and people and the power-knowledge concept.

A Concept of Consciousness of History

The emergence of new media has had a peculiar consciousness on the nation's history. New media having manifested a variety of strands and perspectives on the national narrative running the gamut of those which are aligned, different and significantly those that run counter to it. New media induces the production of other histories of Malaysia. New media, in line with the development of information technology, is not merely a change of technology but a change in thought that affects the construction, reconstruction and the reproduction of the nation-state many times over. Technology/media itself is the message. Technology opened spaces for assertions and claims, construction and deconstruction. There is a surge in consciousness and a new consciousness of the nation's history appears.

This study assumed that in the post 2000 decades, new media was well engaged by the population in Malaysia, and that the influence of its discourse has to be seen in the national and global contexts, and in the relevance of opinion leaders who connect to individuals in the social context. Thus, the research focused on the many histories consumed by the Malaysian public.

RESEARCH OBJECTIVES

This study was concerned with addressing the following four research objectives:

1. To gauge the consciousness of nation's history among its citizens with respect to nation's past over the period concerned.
2. To identify and examine the different perspectives on the nation's history based on ethnicity and region.
3. To identify and examine online sources used and consumed.
4. To study the trajectories and arguments on selected themes and sites on/pertaining to/ related to/having clear implications on Malaysian history in the online media.

METHODOLOGY

This study employed multiple methodologies to provide insights into the complexities of the phenomenon via the examination of texts, gathering of responses from focus groups discussion, in-depth interviews and a nationwide survey.

Examination of Selected Major Sources

The study initially identified and analysed network media content in the likes of selected blogs, Facebook, online newspapers and YouTube in the period being studied, especially over the last five years. Subsequently, it examined online media themes. It also looked at books – appearing especially from the early 2000s. It was significant to note that these books have their origins online – especially from blogs. These form the existent discourse on which this study was founded. Observations made over the years from early 2000s paint a picture of liberation and empowerment – the opportunity and 'spirit' to 'break free' from the conventions of the national narrative. The silence was broken by the new media. The primordial instinct to assert and claim became increasingly visible.

A valid instrument of analysis has been constructed. The instrument contained selected coding schemes derived based on the construction of the nation's history such as events of the past, narratives of the past, historical concepts, contention and contestability, representational expression and moral judgment in history.

Focus Group Discussions

Second, in the use of focus groups discussion, self-disclosure was emphasised to assist participants as a collective to express, explore and clarify perspectives on a subject with which they are familiar. The data obtained was thus far richer and deeper, and varied than one-to-one interviews. Focus groups were compatible with the basic assumptions of qualitative research. The focus group process recognises that multiple views of reality exist and that individual perspectives and the context of an event influence these views of reality.

Focus group interviews yielded a great deal of specific information on a selected topic in a relatively short period of time and provide information with some depth and context. A total of six regions were covered to gather the views, expressions, thoughts and experience.

The participants were selected based on their ability to provide feedback and experience on their engagement with the nation's past. They were chosen mainly by ethnicity and profession. The mode of interview was interactive whereby selected individuals were asked unstructured and probing questions. The major ethnic groups – Malays, and significant minorities as in the Chinese, Tamils, Ibans and Kadazans, and some representation from other ethnicities and identities such as the Punjabis, Chinese Peranakans, Chettis, Melanaus, including the various subgroups from the Orang Ulus, Murut and Orang Sungai. Among these ethnicities were opinion leaders, teachers, writers, activists, journalists, academics, staff in the public sector and members of non-governmental organisations.

Survey Questionnaire

The survey was conducted in six regions, namely Sabah, Sarawak, Klang Valley and the Southern, Eastern and Northern regions. The questionnaire had four sections; demographic background, online media consumption, psychographic background and the consciousness of Malaysian history. These questionnaires were administered to a purposive sample which included members of the public sector, non-governmental

organisations, and academics from universities, with ethnic distribution across the three cohorts. A total of 1,918 questionnaires have been used for this method. Collected data were exported to Statistical Package of the Social Sciences (SPSS) for analyses and descriptive statistics were used to describe the findings.

In-depth Interviews

The in-depth interviews are with intellectuals and opinion leaders who have been known to express views on Malaysia's past and current affairs. Responses were expected to trace pertinent factors as causes that may have led to the configuration of Malaysian history and politics.

DATA ANALYSIS

The study employed a hybrid approach comprising of qualitative content analysis, qualitative analysis and quantitative analysis.

Online Content Analysis

Online contents including websites, blogs, videos and other social media postings were analysed.

Qualitative Analysis

In data processing, the observations on the discourse and outcomes of the in-depth interviews were based on categories of interpretations of what was said, when, why and the context. A different mode was applied to the focus group discussions and questionnaires. For the former, transcriptions were made verbatim in two languages, Bahasa Melayu and English. The data analysis was facilitated using the computer-assisted qualitative data analysis software (CAQCAS), ATLAS.ti version 7.0. The transcripts were analysed in an inductive and deductive process which began with open coding (Strauss, A., & Corbin, 1990).

The data was regrouped and critically analysed again by selecting the main codes that described the real phenomenon of the study. To mitigate against bias, a peer de-briefer was engaged amongst the project members to provide valuable second opinion on the meaning of the data as well as the proposed categories and sub-categories. Through a process of comparative analysis, similar codes were classified into categories from which themes were abstracted and compiled in a scientific hermeneutic unit (HU).

Quantitative Analysis

The questions were clustered into four sections as follows:

1. **Demographic Background.** In order to define the preliminary portraits and identification of the respondents' profile, the researchers used attributes such as gender, age, marital status, highest level of education, employment status, occupation, place of residence, state of residence, type of school, ethnicity, religion, mother tongue and language used daily to acquire personal details information about the respondents.
2. **Psychographic Background.** In order to define attitudes, interests and opinions, questions were asked related to opinions, knowledge, sources, perceived value, and uses of history and how information of history is obtained and shared.
3. **Online Media.** This study identified and examined online sources (themes and sites) used and consumed. A total of eight questions were asked on internet surfing habits, contents consumed, and whether online media has influenced their views on Malaysia.
4. **Consciousness of the nation's history.** Questions identified the forms of consciousness of Malaysia's history namely on whether respondents felt a need for a revision of Malaysian history and whether history has had a role in marginalising particular races or regions.

Psychometric responses were marked on a 5-point Likert scale ranging from "strongly disagree" on one end to "strongly agree" on the other with neutral in the middle.

Sampling and data collection

For the questionnaires, purposive sampling was used to acquire a sample by distributing to the following categories:

1. Forty (40) questionnaires to secondary schools targeting completion by one history teacher and two form four students at each school and distributed to the following types National Secondary Schools (5), National-Type Secondary Schools (Chinese) (2), and Independent Chinese Schools (4) (which declined to participate);
2. Forty (40) questionnaires were distributed to academic and non-academic staff in the selected local universities;
3. Forty (40) questionnaires to public sector employees (according to ethnicity);
4. Forty (40) to non-governmental organisations (according to ethnicity); and
5. One hundred sixty (160) questionnaires regionally for Sabah (Kota Kinabalu and Sandakan), Sarawak (Kuching and Miri), Southern (Johor Bahru and Melaka), Eastern (Kelantan and Kuantan), Northern (Penang and Alor Setar) and Klang Valley (Tanjung Malim, Kuala Lumpur and Perak Tengah).

The data collected and analysed were keyed into the Statistical Package for Social Science (SPSS) based on the first two research questions, which focus on the consciousness of the nation's history manifested; and the online sources used and consumed and their ramifications on the nation's history.

FINDINGS AND DISCUSSIONS

This paper only represents and discusses the findings of the qualitative section of the research.

Basis of Data Presentation

The outcome of the assumptions and methodologies deployed were placed against the narrative from the year 2000 to the present. This study has been premised on several factors and forces internal and external to the nation, by taking the following events as critical junctures in the formation of consciousness of history:

i.   the signing of the Peace Agreement of Hat Yai whose signatories included both the governments of Malaysia and Thailand on the one part and the Communist Party of Malaya on the other in 1989;
ii.   the collapse of the Berlin Wall;
iii. the emerging use of the internet from the mid-1990s;
iv.   the emergence of 'new' identities, and erstwhile forgotten ethnicities from the collapse of and the weakening of old regimes;
v.   the sacking of Datuk Seri Anwar Ibrahim as Deputy Prime Minister in 1998, which resulted in the emergence of alternative spaces, such as blogs and online newspapers;
vi.   the stepping down of Tun Dr Mahathir Mohamad as Prime Minister in 2003 and the 'new Malaysian space' of democratisation; and
vii. a new sense of liberalism during the Tun Abdullah Ahmad Badawi premiership from 2003-2009.

The critical junctures above and the 'New Malaysian Discourse' have had ramifications on the past, and the many ways toward the past, with the future of the nation in mind. It has created a new consciousness expressed through the new technologies, new media and in particular social media. This brings to the national imagination a host of perspectives, subjugating the national narrative and the received history of the nation. It has created new histories, and many histories. The knowledge of the history of Malaysia then has become much ethnicized and regionalised.

During the period under observation, the various interplay of forces, nationally and globally, have led the mainstream history of Malaysia to be challenged, subverted, undermined and threatened. The observations are seen in the writings of Kheng (2003), Manickam (2003). Rajandran (2012), Santhiram (1997) and Ting (2014). Critical to these forces are technology, national politics and globalisation.

The space created by the internet, through the emergence and social use of such platforms as online newspapers and blogs in the early years triggered the trend of the "rewriting" of Malaysian History. This started in 1996 (Sharom, 2010).

The discourse of history as a representation of ideas, events and personalities has been produced by historians, colonial administrator-scholars, and court scribes, with each party informing the other resulting in a stability in recorded history. This stability was disrupted by the advent of certain ideas and events in the 1990s, of which two events in particular had a strong impact globally: the first is the collapse of the Berlin Wall that spelled the end of the Cold War in 1990, and the second, the social use of information communication technologies in the mid-1990s (Christie, 1998; Halligan, 2014). The former represented a shift in ideology, and the latter the far-ranging impact of technology. The end of the Cold War affected the Malaysian political and intellectual landscape in that it also ended the Communist Party of Malaya struggle in 1989. The Cold War formally ended in 1991.

As these issues penetrated the national consciousness, competing discourses of the social contract also began to reappear. This is more so due to the spate of ethnic sensitive comments that imply a poor knowledge of the nation's history, Many have rightly or wrongly conveniently blamed the school system. Ironically, it is at this level - through popular periodicals, the mass media, and the new media– that the different communities would see its representation, misrepresentation or under-representation.

What all these signify is that even, and especially for a nation like Malaysia, there is no single history but many histories, giving rise to competing and contradicting narratives. The writing of news that includes history and of the past often involves the use of stereotypes and prejudice in describing the 'other'. The news media eventually helps us, as humans to construct our perception and judgment towards our 'other'. Subsequently, news stories sometimes contain issues and present images that include various ethnic diversity and group identification. Media constructs audience views to a certain group of people, by highlighting our perception of 'us' and 'them' (Bakhshandeh, 2014; Castañeda, Fuentes-Bautista, & Baruch, 2015; Törnberg & Törnberg, 2016). Said (1978), in his work delves on the 'other', the dominant Occident and the inferior Orient. In Orientalism, he displays the chauvinism of westerner scholars and the 'us' versus 'them' Orientals' paradigm.

It is important to understand the dichotomy between the West and Orient that subsequently imply the context of stereotyping.

Thus, Said also relates various forms of media to show the evidence of 'other'. As such, Orientalism has become a pertinent frame in presenting the nationality of people, race and ethnicity. When we talk about stereotyping, various research has been conducted within the paradigm of cultural-critical (Harding, 2006; Trivundza, 2004). Often, media demonstrates the stereotype of non-white, non-elite groups and minorities by excluding them from coverage and given limited representations. As a result, the media seems to create a homogeneous perception of the 'other', which may affect society as a whole. According to Hall (1997: 257), "stereotyping reduces people to a few, simple, essential characteristics, which are represented as fixed by nature".

The "Other", the New Media, and the Polemics of Malaysian History

Stereotyping makes people ignore the differences between individuals and make generalisations. Since it creates a barrier between individuals of the other group, the labelling of 'other' has become a system of classification in maintaining social and symbolic order. The repertoire of representations of other group of minorities are likely related with past history, for example slavery, colonialism and orientalism (Fürsich, 2010).

In looking into the context of Malaysia, various versions of history have emerged since then. New media technology has opened up space for audiences for a front-stage position in Malaysian society. It has morphed a political space. The new media allows people to play multiple roles as publisher, creator and distributor of contents. Blogs and Facebook are used with ease because of low entry barriers, ease of interaction and ease of reaching a wide audience by transcending geographical space (Reese et al. 2007).

The period under study saw the nation inundated with polemics on history, either as narratives appearing online, or the debates and deliberations itself throughout the country organised by public sectors institutions, universities and civil societies. One such case was the Malaysian National Archives (Archives). In December of 2012, the Archives organised the 28th Sesi Polemik Sejarah Malaysia (28th Malaysia History Polemics Session). The ensuing debates lamented that there are many more sources on local history that has yet to be studied. A case in point was on the early settlement and the founding of Kuala Lumpur. Also on local and family histories. Family genealogies

will always be contested for as long as they are not verified objectively and scientifically. It was suggested at the 2012 event that a National History Academy be established to lend credence to sources kept by institutions and individuals. The National Archives supported the idea and suggested that the Academy could help disseminate the archives resources to the public.

Another example is the polemics of the founding of Kuala Lumpur. There were still members of the society who believe that Yap Ah Loy is the founder of Kuala Lumpur. However, the University of Malaya historian Prof. Emeritus Abdullah Zakaria Ghazali discovered that Raja Abdullah arrived in Kuala Lumpur in 1857 and subsequently opened the tin mines in Ampang. This was followed by Sutan Puasa (1859) and Yap Ah Loy (1863). Abdullah arrived at the conclusion based on the chronology of events and the issuance of the watikah by Sultan Muhammad of Selangor in 1850 and Sultan Abdul Samad in 1864 bestowing authority to Raja Abdullah to administer Klang and its surrounding areas. Professor Abdullah also referred to the letter of agreement between Raja Abdullah bin Raja Jaafar and William H. Read and Tan Kim Cheng. The letters display the seals of Sultan Abdul Samad and of Raja Abdullah ("Polemik Sejarah Malaysia Panas", 2012)[3].

It is significant to note Professor Abdullah's reference to websites and the social media and how these have misdirected, or in this sense reinforced to maintain as a fact that Yap Ah Loy founded Kuala Lumpur. Engaging the internet in constructing, deconstructing or reconstructing history has been central in the consciousness of the nation's history.

A Notion of Online Ideology

This study revealed that the emergence of an online Ideology is evident. This nation is 'online' and its population are ideologically dominated in usage and consumption. Voices that call for changing the social, intellectual and historical landscape have intensified in recent years. The return of the Sulu Sultanate to reclaim Sabah, the return of Singapore to Johore and the return of Pulau Pinang to Kedah are just some of the examples. It has been noted that social media users and political parties in both Malaysia and the Philippines appeared to be provoking the situation in Sabah, among others, with regard to issues on the Sulu claims to Sabah, with even some claiming Sabah is not the Sultanate's[4].

According to Dr. Kamarulnizam Abdullah, Professor of political science at the Institute of Indonesia, Thailand and Singapore Studies, Universiti Utara Malaysia, social media plays a significant role in heightening the consciousness of the past through the provocation of the population. He asserted that the Sultan of Sulu should honour previous agreements in which they ceded the territory to the colonial powers. "We have inherited agreements in the past," he said. He implies that the social media appeared to be politicising the situation to discredit the government of Malaysia and the Philippines. These have also affected national sovereignty and security.

Another example can be seen in the Utusan online article (16 September 2014) calling for a halt to provocations calling for Sabah's exit from the federation "Henti hasut Sabah keluar Malaysia," Although the Sabah issue has been around and discussed for decades, it is only within the last two decades since the use of online media do we find a more intense discourse. The article quotes Sabah Chief Minister Datuk Seri Musa Aman as saying that "Pihak yang masih mencetuskan api kebencian dan menghasut rakyat berhubung isu membawa Sabah keluar daripada Malaysia dinasihatkan supaya menghentikan tindakan mereka itu dengan segera." (Trans: Parties that are still provocating the flames of hatred and inciting the people on bringing Sabah out of Malaysia are advised to immediately stop their actions) Online media not only host writing like the above, they also carry stories on contemporary themes and issues that have ramifications on the nation's past. Some of these demonstrate the ethnicization of our idea of the past and that of the configuration of the nation's history. For example, articles on the polemics of the history of Pulau Pinang have almost always been carried by the Bahasa Melayu papers. One such was in Utusan Melayu Online. This was on problems of Pulau Pinang Malay history and heritage. The article referred to the consciousness and sensitivity of the Pulau Pinang Malays toward their history and heritage. One assertion was that there are still Malays who have a colonial mentality in looking at history (A. Murad Merican, 2011). Another was on the betrayal of Pulau Pinang in history and historiography. The article by A. Murad Merican asserted the Malays as the founding community on the island instead of the Eurasians. It was a rejoinder to the dominant historiography which privileged Francis Light as the benefactor and 'founder' of the island (A. Murad Merican, 2015).

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4   " Don: Sabah is not the sultanate's", The Star Online, Wednesday March 6, 2013. Document accessed from http://www.thestar.com.my/News/Nation/2013/03/06/Don-Sabah-is-not-the-sultanates/. Accessed on 28 May 2015

There are also calls for saving the oldest Malay town, port and settlement in Pulau Pinang. This echoes sentiments from the Malay perspective on the history of Pulau Pinang. The assertion does not necessarily imply a Malay-centric view of history. Instead it called for a more inclusive approach toward the writing of the history of Pulau Pinang. In "Selamatkan Sejarah Batu Uban", A Murad Merican called for a reassessment on the treatment of Pulau Pinang early history.

Another narrative is on the polemic that followed differing interpretations involving the role of the communists in colonial Malaya. The FMT News, an online news portal on 28 March 2015 carried the story of the trial of then PAS deputy president Mohamad Sabu for criminal defamation (of which he was later acquitted), accusing him of disparaging remarks and demeaning the policemen who lost their lives in the communist attack at Bukit Kepong police station in Muar, Johor on 23 February, 1950 (Khoo Kay Kim, 2015). His remarks came in as a response to the renewed narrative on Chin Peng and the Malayan Communist Party after communist literature became more accessible in the country via online sources and through the importation of communist related books.

The criminal trial of Mohammad Sabu was in relation to alleged comments made at political talk in 2011 in which the leader of the armed attack on the Bukit Kepong police station Muhammad Indera of the Malayan Communist Party was held up as a national hero for fighting the British Police stationed there. The basic thrust of his speech was that the country's history up to independence was a lie and that there was something amiss[5] about how history came to be transmitted. He

supported this sentiment by summarising that history recorded that those who supported the British were said to be heroes and those that fought against them were the villains. He also stated that personalities like Datuk Onn Jaafar and Tunku Abdul Rahman did not qualify to be called national heroes 'because they, too, were servants of the British colonial masters; and that the opposition (Pakatan Rakyat) would rewrite the country's history if they won the general election." (Looi Sue-Chern, 2015).

The ensuing trial revealed some of the underlying currents in the nation's history that occasionally appear in the interstices of the national discourse. The trial had called historian Professor Emeritus Khoo Kay Kim as witness, who when examined by the prosecution, explained that Malaya had nine sovereign monarchies "that were never colonised by the British and that they were 'protectorates', where the British 'protected' and 'helped' in managing the state's affairs." During cross-examination, Khoo agreed that the common folk would have viewed the British simply as colonial masters rather than protectors. Khoo further answered to a subsequent question, that the country "did not really gain independence and 'merdeka' was a word politicians like to use." He reiterated that "In my writings, I have never used the word 'merdeka.' The country became a nation-state," adding that, unlike Mohamed Sabu in echoing a popular sentiment, "there was no need to rewrite textbooks to correct history." In the trial, Khoo clarified that the Communists were at war with the British, the police and the Chinese, who supported Kuomintang at the time. The Communists were not "heroes fighting for independence," but has the objective of establishing a

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communist world order which had no boundaries. In what can be seen as a rebuttal against some quarters who want a revival of the Communist ideology and appropriating it in the nation's history, Khoo asserted that "to the Communists, the Communist International was the most important. They did not support the setting up of a nation-state." (Khoo, n.d.).

In what would be another rejoinder to the counter-narrative appearing mostly online, Khoo explained that in the discussion on the future of Malaya, the British went to UMNO, the party that the Malays joined, and not the Parti Kebangsaan Melayu Malaya (PKMM), described as a leftist organisation, mainly supported and joined by the "Other Malaysians," the other Malays of "Indonesian origin." Mat Indera, according to Khoo, was an "Other Malaysia" linked to PKMM, "so it was not surprising that the man was prone to leftist movements."

In the above we see the playing out of the contestation of different polemics of history on the one hand proposing a shift from what is viewed as pro-British sentiment of history towards a revisionist form in contrast to the traditional received version espoused by Khoo.

History as Taught in Schools

This study also looked into the debate centering on secondary school history textbooks. This is significant because such debates seem to coincide with the use of the internet through its various platforms. In this study, it is instructive to set the background on how history is taught in secondary schools in Malaysia, and before the nation-state came into being.

Historian Nordin Hussin suggested for a rewriting of Malaysian history "and to avoid the pitfall of concentrating on the activities of the British administrators." He called for a paradigm shift "to transform this Eurocentric view and interpret history from local perspective."(Nordin Hussin, 2008)[6]. According to Nordin Hussin (2008) from the beginning of the colonisation of Melaka first by the Portuguese, followed by the Dutch and the British, there has been a misrepresentation of Malaysian history in the textbooks. Although Malaysian history was given more prominence in the 1990s, the perspective was still British and not Malaysia-centric. The treatment of local history leaves much to be desired. Nordin Hussin (2008) noted that in the writings on Malaysian 19th and 20th century histories, the emphasis was on the diplomatic bargaining central to the Anglo-Siamese relationship rather than on the events in the Malay states and their related problems with the Siamese[7]. As Nordin Hussin (2008) said, there is a lack of indigenous local and radical elements in the anti-British movement in Malaya, Sabah and Sarawak. The local personalities written about in the history of British Malaya are those that had close relationships with the ruling colonial government. Historical figures involved in armed resistance against British rule did not appear in their earlier textbooks. Citing Ramlah Adam and Sabihah Osman, Nordin noted that reference to personalities

6   See Nordin Hussin (2008), "A Critical Review of the Early Historical Textbooks in Malaysian Secondary Schools,
    Indonesia and the Malay World 36(106): 451-461
7   Ibid. See further on what is called historical distortions detected in the reasons for British intervention in the Malay states.

such as Mat Kilau, Mat Salleh, Rentap and Tok Janggut are only found after the Ministry of Education revised the history curriculum (Nordin Hussin, n.d.). [8]

According to Nordin Hussin (2008) again, the most heroic figures were obviously those who had cordial relations with the British, or those who were Anglophiles. Tunku Abdul Rahman, the first prime minister was positively portrayed whereas Mat Salleh and Rentap who fought against the British, against imperial powers, are pictured as rebels. It is only recently that they have been recognised.

As stated by Nordin Hussin (2008) pressures and demands made by certain quarters, resonating with the emergence of the narrative in the online media, have made this possible. They are now national heroes rather than traitors. However, Nordin Hussin (2008) said that in recent times, due to the assertion by non-Malay groups on their role in nation-building, there is an over-emphasis on what Nordin Hussin described as Asian migrants' activities. The Malays were side-lined and their roles in the development of the country escaped the attention of historians. Issues such as who brought modernisation to society have been distorted, with greater emphasis given to the west, with the claim that they came to the colonies on a mission to 'civilise' the natives. Such writings exhibit the lack of understanding of local religion and practices that also led to a warped image of the Malays.

With Malays side-lined, historians went to great length to spotlight the roles of the Chinese and Indians in economic development and "national" contribution.

As such, we can establish that the writing and interpretation of Malaysian history is an inequitable understanding of history in a divided nation. Apart from colonialism, post-colonial circumstances have created a nation, historically divided, with diverse views on the past, and pastness. This results in the weakening of the national character.

In 2011, the Centre for Policy Initiatives published a blog (Malaysian History Textbooks: Whose History, 2015) raising the issue of "whose history?" in Malaysian history textbooks. It began by referring to the announcement by the then Deputy Prime Minister and Education Minister Tan Sri Muhyiddin Yassin that History will be made a must-pass subject for the Sijil Pelajaran Malaysia (Malaysian Certificate of Education) from 2013, which would put it on par with Bahasa Malaysia in its degree of importance. It was stated that the Education Ministry will also introduce a revised SPM History curriculum in 2017. New elements to be incorporated when the History syllabus begins its new cycle are 'patriotism,' 'citizenship' and the 'constitution,' 'which by extension implicate the so-called social contract,' according to the blog. The initiative received response and reactions from various groups, ranging from support to disagreement.

8   Nordin Hussin, op.cit.

Selected Blogs, Facebook and Online News

This part looks into the text that have been produced online in the form of blogs and online news. A dominant feature in the text suggests a revision of history and a deconstruction of the Malays. On 2 April 2006, Tony Pua, a member of a political party wrote an article in his blog entitled *"Rewriting Our History"*. He cites on the revisionisms extant in the country's history taught in secondary schools and the 'imbalanced' nature of historical textbooks (*"Rewriting our History"*, n.d.).[9] In *"Kata Tak Nak: No Malay Race? Tell that to the Kampung People,"* published on 6 June, 2007, author Nazir Mahmud, responding to the arguments that the 'Bangsa Melayu' (Malay Race) do not exist, countered that this claim is incongruent to the collective memory of the Malays (*"No Malay Race Tell"*, n.d.)[10]. Later on 17 June 2009, Mat Asri again responded on the issue of Malay Race by delving into the origins of the Malays in response to the blog titled *"Contesting Malayness"* written under the pseudonym Michael Chick, who argued that the "Malays are not a race." *"Contesting Malayness"*[11] subsequently went viral in cyberspace, with readers mainly interested in its significant discourse in deconstructing the Malays. On 1 February 2010, a blog titled *"An Uncensored History of Malaysia: What our History Textbooks did not Teach us about our Early Cultural Relations"* focused on the racial and religious tensions between Malays and Hindus. The author wanted the audience to know "the true history of Malaysia" and urged the "people to unite." (*"An Uncensored History of Malaysia: What our History Textbooks did not Teach us about our Early Cultural Relations"*", n.d.)[12].

A similar theme on deconstructing the Malays was found *"Benarkah Nama Asal 'Tanah Melayu ialah Barr Chin' atau Tanah China?'* (trans. Is it true that the original name of the Malay peninsula is Barr Chin or China's Land?) was published on 28 March 2010.[13] Musli Oli was commenting on Michael Chick's argument contesting the origins of the "Semenanjung Tanah Melayu" – the Malay peninsula as, "Semenanjung Bar Xin or Barr Chin", which refers to China. He rebutted Chick's argument and stated it as "a propaganda to claim Chinese rights." On 29 October of the same year, a blog article entitled *"Cheek of Michael Chick"* by author Kosong Café cited Chick's statements "Who says that the Peninsular was always called 'Tanah Melayu'? and "Why was Tanah Melayu never mentioned in Sejarah Melayu?"[14] In *"Sejarah yang dilencongkan, wajah Sebenar Kemerdekaan Malaysia"*,[15] Ikhwan Nain revealed his investigation on what he called the 'falsification of national history' by various parties through history textbooks and other sources. Another blog article entitled *"Penipuan Sejarah Mengenai Asal Nama Malaysia"* (trans. Historical deceits on the original name of Malaysia) by Enrike in which he revealed the origins and the 'fraudulent' history of Malaysia and where the name 'Malaysia' comes from. [16]

9   Internet document. Http://educationmalaysia.blogspot.com/2006/04/rewriting-our-history.html
10 Internet document. http://katakaknak.blogspot.com/2007/06/no-malay-race-tell-that-to-kampung.html
11 Internet document. http://mattingtong.blogspot.com/2009/06/contesting-malayness-michael.html
12 Internet document. Http://adifferentkndofmalay.blogspot.com/2010/02/uncensored-history-of-malaysia-what-our.html
13 Internet document. http://muslioli.blogspot.com/2010/03/asal-usul-nama-tanah-melayu-ialah-bar.html
14 Internet document. http://kosongcafe.blogspot.com/2010/10/cheek-of-michael-chick.html
15 Internet document. http://sahabatblogsabah.blogspot.com/2011/09/sejarah-yang-dilencongkan-wajah-sebenar.html
16 Internet document. http://ilhampertapa.blogspot.com/2012/11/buku-sejarah-yang-ditulis-oleh-penjajah.html

Another Facebook posting is titled **"There are no Pendatang Here: Only Malaysians"** (trans. There no Migrants here: Only Malaysians) cited from The Star Online, 26th March 2015.[17] The Star had started a campaign to counter the narrative that posits the non-Malays as 'pendatangs' (migrants). It posted an image to invite Malaysians to be part of their survey with their caption "There are no pendatangs here." On the same day the Star ran another image, which appeared online, titled **"We are all Rojak and that's the Beauty of it"**[18] (trans. we are all a hodgepodge and that's the beauty of it) in which they invited Malaysians to participate in the Star Moderation Survey.

Thus we see in the previous sections how the narratives and counter-narratives pertaining to various aspects of history have through the medium of the internet become a contested space with varying forms of historical consciousness, coinciding with the rise of blogs, social media and online texts.

Selected Videos on YouTube

YouTube is a social video sharing platform. This study also focused on the contents in YouTube relating to historical polemics and having implications on the writing of the nation's history. The narratives represented in the videos resonate with Malaysia as a contested nation. The contents were evaluated from the discussions in Focus Group Discussions which were held in six separate areas.

This study began on 1 March 2015 until 30 August 2017, and related issues/themes were considered for the choices of the videos. The videos selected directly gives an impression of the awareness towards history and the country's history. They displayed the contestation at the heart of the study. The following were observations of four selected videos.

Video No. 1: 10 Tahun Sebelum Merdeka

This video was directed by Fahmi Reza and financed by the Konrad Adenauer Foundation. It is a documentary about the mass civil disobedience and industrial strike movement known as the All-Malaya Hartal (from the Gujerati word signifying closing down of shops and used by Mahatma Gandhi to refer to Anti-British general strikes) which took place in 1947 in Malaya, instigated by left wing groups of the time.

Hartal Day commemorates the historic day the people of Malaya united in the struggle for democracy and liberation from British rule. That event was also to protest against the undemocratic Federation of Malaya Constitutional Proposal devised by the British Colonial Government. It was posted in 2007 by the director himself. It is of 35.20-minute duration, divided into 4 slots. The first slot is 8.51 minutes long and have been viewed 202,3610 times.

17 Internet document. https://www.facebook.com/The Star Online/photos/pb.11450527254,-22075200.1433901131./10152406764302255/ ?type=3&t heater
18 Internet document. https://www.facebook.com/The Star Online/photos/pb.11450527254,-22075200.1433901131./10152406764302255/ ?type=3&t heater

The second slot has a duration of 8.52 minutes and viewed 69,361 times. The third slot is 8.59 minutes and viewed 60,722 times. All these numbers are taken on 26 July 2017. The video was also uploaded by other parties using their respective accounts. Among them are Komas Centre (2011), Freedom Film Festival (2015), 10 Tahun (2007), Grace Lim (2009) Luwrald Luwis (2012) and more YouTube account holders. The video has been shared through various applications like engagement.com (2012). Vimeo.com (2007), WhatsApp, Facebook, Twitter etc.

In YouTube, the video was categorised under news and politics. The video was awarded the Most Outstanding Human Rights Film at the Freedom Film Festival in 2007. It contains interviews with five former left wing political leaders before Hartal Day took place in 1948. They are Hj Yahya Nassim (deputy treasurer of Malay Nationalist Party), active in Malaya People's Party under the leadership of Ahmad Boestamam. The others are Zainuddin Andika [PKMM], Hashim Saad [PKMM], Majid Salleh [FTU's president] and Lim Kian Chye (founder of Malaya Democratic Union). Except for Lim Kim Chye, all the interviewees had been imprisoned by the British for between four to seven years under the Emergency Act 1948 .

The director of the video used documents and archives in the form of newspaper cuttings from Warta Negara, Malaya Tribune, The Singapore Free Press, The Straits Times, Utusan Melayu to support the documentary. There are also clips of old films portraying the sociocultural values of the fishermen community and the excesses of the western colonial community at that time.

Some figures from the Indonesian struggle against colonialists were also highlighted. There are Bung Tomo, Tan Malaka, Alimin, Musso and Sameon. All were leaders of the Indonesian Communist Party (PKI). Photos of Sukarno, the Indonesian President at that time was also included in the video. Meanwhile, photos of local leaders inserted in the video are Dato Onn Jaafar, Tunku Abdul Rahman, Ahmad Boestamam, Burhanuddin al Helmy, Rashid Talu, Shamsiah Fakeh, Ishak Hj Muhammad, etc. Most were considered left leaning. The role of Ibrahim Yaakub (President of Kesatuan Melayu Muda Malaya) in spreading the influence of the awareness of independence was highlighted when one of the interviews mentioned a book titled 'Melihat Tanahair', written by Ibrahim Yaakub. Also highlighted was a book titled 'Testament Politik API' by Ahmad Boestamam.

At the time of study, there have been 121 comments by the public in the comment section. The number of comments is only recorded from the same video which was uploaded by a YouTube account holder by the username of Fahmireza. One of the commenters named M. Firdaus wrote, "Historical frauds in the textbooks, saying that those who struggle against colonialism were UMNO, but in fact it was PKMM who fought and struggled, UMNO was founded only to save the elites and British." Another comment by the name of Nik Kamarul wrote that, "Nampaknya hak rakyat berbanding pihak UMNO yang di anggotai oleh golongan bangsawan dan Pro-British'. Lao Hlong commented: 'Every race has the right to self-determination. Go! Sabah Go!'. Thisismirul wrote,'the untold history of Malaysia. We've been brainwashed by the 'official' textbook in school.'

Fahmireza, in responding to some of the comments wrote, "On the interviews being

one-sided, please watch almost all the documentaries in TV on the history of our independence. This is a narrative from the left wing political group, and there is no harm in listening. You are free to agree or disagree, to believe or not believe"..."This documentary is indeed a propaganda. All Michael Moore's documentaries have propaganda, all documents with political motives have propaganda. You are free to agree or disagree"... "'Objective' political documentaries do not exist. It is not news. Even news is rarely 'objective'. Usually they are subjective perspectives of authors or artists." The video director also commented: 'Yes, this is a propaganda to make you think critically on the historical propagandas learnt at school.'

Video No. 2: Sabah Sarawak Keluar Malaysia (SSKM)

The second video Sabah Sarawak Keluar Malaysia (SSKM) (trans. Sabah Sarawak Quit Malaysia) was uploaded by Trulysabahan on 5th March 2012. In this video, Doris Jones who is the SSKM representative urged all Sabahan and Sarawakian to unite and pull out from the Federation of Malaysia. There is no mention of the video producer's identity and background. The video depicts the uploader's views on the origins of Borneo and argues for the rights of Sabahan and Sarawakian. The channel belonging to the owner of the video has been subscribed by 1,200 users and the video has been viewed 125,087 times, liked by 1,288 people and had 1,851 comments. The video uploader categorised the video in 'news and politics'. The video was only uploaded by Trulysabahan unlike the video '10 Years Before Independence' which was uploaded by many users.

The 33.22 minutes documentary argues the merits of Sabah and Sarawak exiting the Federation of Malaysia. At the beginning, the video explains the history and facts as to reasons why both states have to pull out from the Federation of Malaysia and be independent. The video also stated that Articles 18 and 20 of the Malaysian Agreement have been ignored by the Federal government.

The video starts off by presenting that Sabah and Sarawak became independent nations on the 22 July 1963 and 21 August 1963 respectively. It also mentioned that the concept of forming the Federation of Malaysia was an establishment and not a federal merger. The status of Sabah, Sarawak and Singapore were 'countries' which the narrator claimed was different from the 11 states which formed the Federation of Malaya. The video publisher is of the opinion that when Singapore pulled out from Malaysia, automatically Sabah and Sarawak should also be removed from the federation. To support the statement, voice recordings of Sabah leaders at independence, namely Tun Datu Mustafa and Donald Stephen during the declaration of Sabah's independence are included.

Also included in the video are parts of the broadcast recording of Prime Minister Tunku Abdul Rahman speaking on Singapore's decision to remove itself from the Federation of Malaysia. A few newspaper cuttings from Borneo Times, Sabah Times and Oversea Chinese Daily News were used to record some related events. Also shown were contents of the Agreement of Federal Malaysia and the speech of Charles Brooke during the handing over of Sarawak to the British government.

A total of 1,851 comments were recorded on the comment section of the video. A large number of the comments were in support of the documentary.

A YouTube account holder going by the username kerayzey wrote, "Sabah & Sarawak should separate from Malaysia to form a new country. We are not comfortable with a racist government"… "We Sabahan & Sarawakian are less concerned of what religion or races you have, as long as you're good people." Another account user named Mohd Hisyam commented, "we should exit from Malaysia Agreement… the honour and dignity of Sarawak and Sabah are being toyed around… the people of Malaya do not easily violate our honour. There will be a time when we will. THERE WILL COME A TIME WHEN WE SHALL RISE! Just wait. All the chaos that happen only in Peninsular and not Sabah and Sarawak. By the way, nice video. I will share it."

Another comment: "I was born in Sarawak, raised in Sabah and received education in the Peninsular, and it is obvious to me injustice is everywhere… political games and inside corruption is getting more common, unity in Malaysia has thinner chance to develop… politics shall destroy Malaysia.." A similar statement by another YouTube account holder by the name 'The Pain' commented: "To me Sabah and Sarawak to exit Malaysia is not a solution.. we only need justice and balance in economics and development. WE HAVE BEEN OUTCASTED. We need a leader who truly cares and fights for Sabah."

Video No. 3: Chong Eng: Malays are migrants too

The third video was an interview session with a member of Parliament of Bukit Mertajam from the Democratic Action Party (DAP), by the name of Chong Eng. It was produced by KiniTV.com and uploaded on 24 March 2011. KiniTV.com is an internet TV news site owned by online news portal Malaysiakini.com. The video titled "Chong Eng: Malays are migrants too" has attracted 147,059 views, 312 likes and 865 dislikes. The KiniTV YouTube channel has 373,000 subscribers. The duration was 2.54 minutes and categorised under 'News & Politics'. The comment section was disabled. The interview was conducted in the parliament building of Malaysia.

The video only showed Chong Eng's answer without the questions directed to her. Chong Eng began the interview by denying the allegation from the Education Minister that there were no complaints on the term 'pendatang (immigrants)' by the Malays and non-Malays. To Chong Eng, there is another view that says not only the Chinese and Indians are immigrants, but the Malays too. Accordingly, in the interview, only the Orang Asli as the indigenous people are considered originally from Malaysia.

Furthermore, she said "The statement in the history textbooks have created confusion especially among Form 5 students, that even at this level they were unable to make an analysis…this has become a serious issue because books are supposed to instil good values and not create problems for the future."

Video No. 4: Malay Origins

This video was produced by Zaharah Sulaiman, writer and researcher. It is titled 'History of the Malay World through Centuries of Civilizations' however in YouTube the title was written 'Malay Origins'. It was uploaded by a YouTube account user with the name 'Panglima Hitam' on 24 July 2013. Categorised under 'people & blogs', the video has been viewed 434,831 times and received 1,784 likes. The channel of Panglima Awang has 1,300 subscribers and the video has received 1,223 comments ever since it was uploaded.

The video is in documentary form and is the result of the study by Zaharah Sulaiman, who among others is affiliated to the Society of Archaeology Malaysia. This video records the producer's appreciation for some scholars for their support for the production of this research, like Prof. Dr. Stephen Oppenhiemer, Prof. Dato Dr. Wan Hashim Wan Teh, Prof. Dr. Zafarina Zainuddin, Prof. Emeritus Dato Dr. Nik Hassan Shuhaimi Nik Abdul Rahman and Allahyarham Dr. Nik Anuar Nik Abdul Rashid.

The video begins with a group of people who made it out alive during the eruption of Mount Toba. They were safe because they took refuge inside a cave. It is estimated that the inhabitants of the earth at that time were only around 10,000 people. It stated that the inhabitants have undergone an evolution of more than 35,000 years, 'developing a great civilisation.' Pentas Sunda is also known as 'Founder of Human Civilisations'. The communities there live in groups. The first group known as 'Orang Asli' is made up of the tribes Temiar, Jakun, Temuan, Semelai, Batek, Jahai, Mendrik, Semang dan Senoi. They live as nomads, moving from one place to another.

What is significant is that the video is aimed at promoting Malay origins and civilisation. It refers to the Bujang Valley in Kedah Tua - "estimated to be of hundreds of thousands years of age." The monument in Sungai Batu which is 1,900 years old is believed to be the oldest in South East Asia. It is older than the Borobudor and Angkor Wat. Here metal industries and building of furnace are 8,000 years older than the Chinese civilisation. Western scholars think of the civilisations in Sunda Plate as the 'Cradle of Human Civilization.'

It relates to the periods of massive flooding in the Sunda area about 10 thousand, 11 thousand and 14 thousand years ago which caused an alteration in the geographical forms of Sunda Plate that we see today. This phenomenon is a result of a series of earthquakes, volcanic eruptions and rising global temperatures due to melting glaciers. This is linked to the origins of the Malays. The Malay community in South East Asia migrated to the lands and formed their communities and civilisations there. This video also denies the theory of Malays originating from Yunnan.

Some comments are as follows. A user named Zaputra wrote: "The Malay race has inhabited the South East Asia generally. And a few historians stated that the Malay race came from Yunnan in South China... Thus we can pick the theory that there is a possibility that marriages between the immigrants and the Austronesia and Polynesia race that resulted in the Malay race...who resided in Java and became the Javanese tribe etc.. They are assumed to be Malaysians when they have the same experience."

Another YouTube user named Swadi Rahmad wrote: "Some of these theories are believable, however this study is too bias, as if there is a political propaganda, for example the Orang Asli in Peninsular Malaysia was more highlighted compared to the orang Asli on the islands. As if the orang Asli in Peninsular existed before those on the islands and another is the claims by one party which stated that Kedah Tua is the earliest main civilisation as if Kedah was the centre of Sundaland. What is certain is the centre of the civilisation…".

There are people trying to challenge the national history's version through the online media to instil awareness in new history. The freedom and technological advance in multimedia and communication has brought the society to a different world full of diversity and mixture of views. The video sharing application enable people to share a video clip widely and quickly. The comment section becomes a discussion room for the public to upgrade their awareness on the issues in the video.

Multilateral discussions lead to long debates with depth. Some of the discourses tend to stray from the central topic and lead to other discourse topics. These strings of discourses result in more awareness on history, and the nation's history becomes more complex. In the clip video '10 Years Before Independence', there are at least 2 or 3 factions identified. The first faction stood with the official version of history.

The second more dominantly chose to promote the idea that the Independence achieved by Malaya was the result of the struggle by left political group whose contributions were denied in the country's historical flow. The comments written by the public voiced their sympathies and support for the left political leaders. Elsewhere, in the case of the video 'SSKM', the factional differences were more regional and by ethnicity. Based on the discourse in the comment section, commenters believed to be from Sabah and Sarawak gave positive feedbacks on the video. Commenters of Malay ethnicity, based on the username and language used, are more moderate. However, comments believed to be from non-Malays and non-Bumiputras are firmly persistent in wanting separation from the Federation of Malaya.

The new awareness on subjects such as the formation of Malaysia, the issue of Federation and Independence, started small and was marginal. But in time, the awareness has increased and spread. From using online medium to spread their intentions to the public, the movement now has taken approaches like taking to the streets through applications like WhatsApp, Instagram etc. They invite the public to join peaceful demonstrations. The events are made viral to create a bigger momentum and stronger impact.

Focus Group

From deliberations by the various Focus Groups, the majority of respondents agreed that the new media and history are intertwined. They saw history more as life lessons, past events and society story rather than a mere school subject. This indicated a level of consciousness on the nation's history.

The same goes for Sarawak respondents. However, they viewed history as more crucial, in that it is seen as the basis to the development of the country and unity of the various ethnicities and regions. Moreover, it is about citizen's identity and politics. Respondents from the North had similar opinions where they see history as a nations' heritage.

On the different perspectives represented, respondents express awareness that much of nation's history is decided by 'the powerful hand' and 'the winner' and it has some shortcomings. This has led to differences in perspectives based on ethnicity and region. Respondents in the southern region think

the history is decided by the historian and generally, any other changes are done by historians as well.

Most of the respondents think that history should be revised and rewritten. On the other hand, respondents in Klang Valley gave a mixed response. Without denying that the narrative has been ethnicized, in that the history of Malaysia is seen from ethnic lenses, there are quite a few who think that the rearrangement of the nation's history is not needed and might cause other problems.

On the links to online sources, it was discovered that the new media provide a new medium for freely voicing one's views. The media plays a very important role in influencing their thinking. Some respondents in the East Coast thought that history through the new media does not always grant good values to the story of the nation – as the new media do not have a proper valuing process and the information that exists in the internet can be deceptive.

RECOMMENDATION

This study discovers that social media platforms provide a new public space contesting various hegemonies and centricisms – in this instance that of the consciousness of the history of Malaysia. The virtual space provided by internet empowers the minorities, the marginalised and the subaltern of voice, expression and a past.

The consciousness of the country's history has been visible due to the new media environment. (The Malaysian) national history thus is being contested. Alternatives versions permeate the social, cultural and intellectual environments. Forging the nation's collective memory, consciousness and historical imagination are actually a crucial work and also an integral process of nation building. Hence, the powerful link between history, memory, consciousness and imagination are somewhat new to be explored in new media.

Manipulation of the past often involves the use of stereotypes and prejudice in describing 'other'. The new media facilitates the construction and reconstruction of a desired past. It is significant in influencing people's thoughts and sentiments. They are used to spread information in a more practical way. The new media may project influence on how audience interlink images that they perceived with the past and the future, in which they participate in forming a narrative of collection memory and imagination. The fragmentation of the nation's history does not bode well for national integration and advancement.

A number of issues have emerged in the course of the study. One is the methodologies used and its operationalisation. This is especially so for the Focus Group. There are reservations among some respondents. The organisation and conduct of the focus group could also be based on different ethnic groups. Grouping every ethnic group together at the same time have inhibited expressions and interactions and discussions. People were careful of what they say of their other.

The other methodology that could be useful is to conduct ethnographic interviews with respondents representing the different ethnic groups. Further in the course of the research, questions on 'national history,' 'formal history,' 'textbook history' and 'public history' emerged. Their ambivalence and absence/presence in the discourse further renders weight to the problem. This provides space, both intellectual and political, for revisionism from the Kuala Lumpur/Putrajaya-centered history.

Contrary to popular belief, people are pulled toward history. Much interests have been expressed by those whom the research team came into contact. The engagement with the past online bring a new form of media literacy. But there is also another aspect, that is a new kind of opinion leader – a rediscovery of sorts, whereby those who were engaged with the new media now are seen to function as opinion leaders.

The two-step flow theory was prevalent in the 1960s and 1970s. The emergence of the new media in the 1990s were thought to have prepared for the disappearance of the opinion leader. The study also implies on the category of the 'history of Malaysia', and school textbooks on the subject. The various stakeholders on the nation's history must reassess that category in light of Malaysia as a nation-state among the many nation states in the Malay Archipelago.

Hence, this study makes two recommendations. First, that national history textbooks go beyond 'national history' to include regional histories. Histories do not begin with the birth of nations (the modern nation-state), and do not end at the borders. Second, findings from this study warrant some form of an arbitration/mitigation mechanism to address the past of Malaysia. That mechanism is in the form of a Tribunal on National History. This will function as a formal conduit for public inquiry, to arbitrate, and adjudicate on matters of urgent public importance, investigation of claims on contestations on the past, the reports of which are to be made public. The Tribunal on National History is not a court of law but carries a semi-legal significance. Although the acceptance of the past would be by consensus and collective memory of groups, and groups in a nation, it is important that such a Tribunal exists to 'regulate' and untangle contestations on ideas, events and personalities for the sustenance of the national narrative and society.

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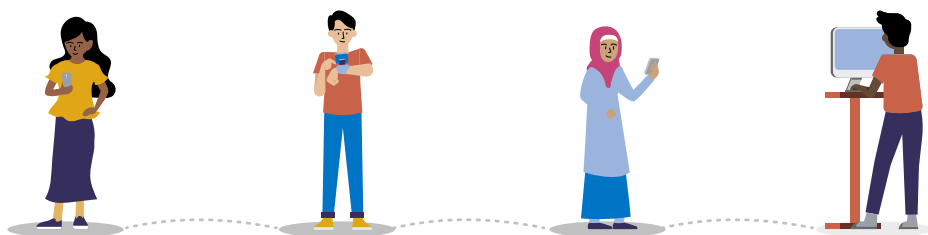research.enterprise@mcmc.gov.my

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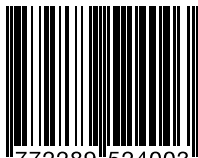Fax: +60 3 8688 1000

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