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Guest Editor
Ts. Dr. NurulNadwan Aziz

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FOREWORD

Global Research Conference (GRaCe 2020) was conducted in a virtual space on 16 - 18 October 2020. The conference was organised by the Department of Research and Industrial Linkages, Universiti Teknologi MARA Cawangan Terengganu in collaboration with several local and foreign universities, as well as private and government agencies.

In line with its latest theme, "Hybridising Transdisciplinary Research towards Digital Society 5.0", GRaCe 2020 addresses current issues in the digital era through cross-discipline research. It aims to provide an excellent opportunity for scholars, academic scientists, researchers, industrial practitioners, and students worldwide to share and exchange concepts, theories, methodologies, empirical results, and translational innovations resulting from the research conducted.

Guest Editor:
Ts. Dr. NurulNadwan Aziz

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The aim of the SEARCH Journal of Media and Communication Research is to promote and enhance research development and debates in the field of media and communication research. It also serves as a forum for researchers and industry players who use research as the frame for social awareness and change. We welcome any submission of manuscripts throughout the year. Authors are invited to submit scholarly works on communication such as International Relations, Media Management, Film and Media Arts, Digital Education and Communities, Communication and Policies, Globalization and Social Impact, Youth and Media, Audience and Perception Analysis, Democracy and Integration, Media Literacy and Education, Media and Development, Health Communication, Politics, Hegemony and the Media, Gender and Sexuality, Social Media and Subcultures, Popular Culture and Society, Media and Religion, Media and Identity, War/Peace Journalism, Conflict and Crisis Communication, Strategic Communication and Information Management, Digital Media, Advertising and Persuasive Management, Public Relations and Crisis Management, Global Journalism and relevant areas from the standpoint of media and communication research.

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e-Justice: Students' complaints made easy

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ABSTRACT

One of the key components of student empowerment is their participation in the decision-making process. Thus, the Students' Affairs Department of Universiti Teknologi MARA Cawangan Terengganu established a student unit known as *Badan Keadilan Mahasiswa*. Under this unit, there are two sub-units which are, *Badan Guaman Mahasiswa* and *Tribunal Keadilan Mahasiswa*; the latter holds a quasi-judicial function. The tribunal shoulders the responsibility of assisting the Students' Affairs Department in hearing student complaints. One of its initiatives is e-Justice, an electronic complaint system for students to lodge their grievances involving student against student, student against club or society, or club or society against another club or society. The system was initiated to replace the previous system to improve its visibility amongst students. The aim of this paper is to elaborate on the workings of the new system and to evaluate its effectiveness in comparison to the previous system. This study is significant as student development and empowerment needs to keep abreast with new technologies and take cognisant of the social nature of today's new generation of students. Besides that, this study also benefits the Students' Affairs Department in developing student leadership.

Keywords: ***Empowerment, student, tribunal, justice, dispute, resolution, legal***

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INTRODUCTION

In the higher education ecosystem, students are one of the most important stakeholders that determine an institution's contribution to human transformation, social and community engagements as well as the economic growth of the community or country. Therefore, higher education institutions need to constantly evolve and upgrade themselves from time to time to meet the current demand of dynamic industries, professions, and economies. In this regard, up-to-date courses and syllabi, well-equipped facilities, quality academic staff, efficacy of management and departmental staff as well as the academic and non-academic quality of students play significant roles in ensuring the quality of an institution.

Student empowerment in higher education institutions is a predominant factor in shaping the future leaders of the community and country. Therefore, it is the responsibility of these institutions to develop and assist this empowerment by establishing proper platforms for students to express themselves and actively participate in student governance. Empowerment, as defined by Dymond (2018), is a process in which the adult must commit to providing opportunities for students to have influence in their school or institution, to feel safe to speak knowing everyone is respected, and to participate in instructional decisions. Therefore, to make the students feel belonged in an institution and to allow their voices be heard, some universities have created speakers' corner as a platform for a two-way communication between the students and the managerial departments. According to Tapsir (2018), the establishment of the speakers' corner at public universities builds students' empowerment and courage to speak up. This is pertinent as the students become aware that their views can have impact on their environment (Mohd Sharif, Mohamad Selamat, & Gobilik, 2017). Besides that, studies have found that student empowerment influences higher academic achievements (Kirk et al., 2016) as well as builds the characters of future leaders (Black, Magee, Berman, & Groundwater-Smith, 2014).

Traditionally, student matters are managed by the Students' Affairs Office. From students' co-curricular activities to residential colleges, these come under the purview and responsibility of the Students' Affairs Office. Students' matters can be cumbersome and sometimes complicated to handle; some may seem trivial, but if not handled promptly or solved immediately, may lead to other problems.

Moreover, if there are no available platforms to complain, the affected students may opt to raise the matter on social media, which may implicate negatively the university's management, image, and reputation. This is because, according to Swain (2011), students of the digital era nowadays are more inclined to trust the opinions of their anonymous peers on social media rather than the management of the university itself. Moreover, negative tweets or online comments can easily become viral. However, it should be noted that there are two sides of the coin in this situation. By posting negative remarks about the university, the students also damage their own reputation and this may affect their future, especially when they graduate and begin to seek employment (Nelson, 2017).

Taking cognisant of this, the Students' Affairs Office of Universiti Teknologi MARA Cawangan Terengganu established a student unit known as *Badan Keadilan Mahasiswa* in 2014, which is divided into two divisions, namely *Badan Guaman Mahasiswa* and *Tribunal Keadilan Mahasiswa*. The function of both divisions is to handle matters pertaining to student discipline. Badan Guaman Mahasiswa deals with students having disciplinary charges brought against them by the university, whilst *Tribunal Keadilan Mahasiswa* holds a quasi-judicial function to hear and adjudicate cases brought up by a student or club to the tribunal. The effect of the tribunal decision is equivalent to one made by the Student Disciplinary Committee under the Students' Affairs Office.

Basis of establishment

The idea of a student tribunal was inspired by the Educational Institutions (Discipline) Act 1976 (Act 174). The relevant provisions can be found in Section 5 which lay down the disciplinary authority in respect to students of an institution. Section 5 states as follows:

(1) The disciplinary authority of an Institution in respect of every student of an Institution shall be such member of the staff as the Minister may designate; the member of the staff so designated shall be known as the Students' Affairs Officer.

(2) The Students' Affairs Officer shall have the power to take such disciplinary action and impose such disciplinary punishment as provided under the Second Schedule.

(3) The Students' Affairs Officer may delegate his disciplinary functions, powers, or duties to any member of the staff, in respect of any particular student or any class or category of the students of the Institution.

(3A) The Students' Affairs Officer, or the member of the staff or the board of members of the staff delegated with the functions, powers, or duties under subsection (3), shall inform the student in writing of the grounds on which it is proposed to take action against him and shall afford him reasonable opportunity of being heard.

(3B) A student of an Institution shall have the right to be represented by a staff or another student of the Institution in any disciplinary proceedings taken against him.

(3C) A student of an Institution shall be allowed to make a written or an oral representation in any disciplinary proceedings taken against him.

(3D) The decision of the Students' Affairs Officer, the member of the staff or the board member of the staff, as the case may be, in any disciplinary proceedings taken against a student of an Institution shall be communicated in writing to the student within fourteen days of the date of the decision.

Based on the abovementioned provisions, the Students' Affairs Office has the authority to assign the Law Department to administer a student unit which has a judiciary function, namely *Tribunal Keadilan Mahasiswa* (Refer to clause 3 above). The purpose of the unit is for a students' tribunal to be established, in liew of a Student Union. The students who are members of this unit are supervised by a group of law lecturers who act as advisors, facilitators as well as the Board of Directors responsible for helping the students in decision making. The members of *Tribunal Keadilan Mahasiswa* must undergo compulsory trainings and courses organised by the Law Department. The Board of Directors also has a role in selecting eligible students as members of the student tribunal panel.

METHODOLOGY

This paper is a hybrid/concept paper whereby the ideas of *Tribunal Keadilan Mahasiswa* were established and implemented in Universiti Teknologi MARA Cawangan Terengganu (UiTMCT) and situations narrated in the paper are based on real cases and situations handled by the *Tribunal Keadilan Mahasiswa*.

Salient features of Tribunal Keadilan Mahasiswa

Before the inception of *Tribunal Keadilan Mahasiswa* (TKM), any complaint regarding matters involving students is often dealt with at the university level through disciplinary proceedings. As a student, one must strive to avoid being subjected to any disciplinary action as it may tarnish his/her reputation as well as impede the continuation of his/her studies or eligibility for awards such as best student. However, there were shortcomings

with this system, as some cases may not qualify for disciplinary proceedings. More often, these issues are beyond the purview of residential college or club matters and as such, are handled by neither the Students' Affairs Office nor the Office of Academic Affairs. Hence, there was no appropriate channel provided by the Students' Affairs Department, as well as no specific and effective mechanism to resolve matters pertaining to personal conflicts between students, student conflicts with their respective clubs or club members as well as disputes between internal clubs or societies on the campus.

Fitriana, Souket and Yie (2019) in their research regarding cyberbullying and victimisation among Malaysian university students found that adult supervision is rarely present to intervene when cyber victimisation occurs. The researchers suggested that future research is needed to progressively find new possible intervention and prevention measures to overcome the issue. Moreover, Waheed (2019) opined that the period of adolescence is associated with risky behaviour and is heavily influenced by peers, whereby the approval of parents is often deemed less worthy than that of peers.

Some examples of unresolved disputes amongst students are given next.

(i) Student vs Student
A group of four students is given an assignment by their lecturer. One of the members did not contribute to the project but managed to get good marks since the marks are given for group work. The other three members were not happy with the free-rider. They informed their lecturer, but the lecturer asked for proof.

(ii) Student vs Club
As club members, students need to pay club fees as well as other agreed fees. In return, the club members will receive some merchandise; however, those with positions (management) are given prerogative over the others. New members of a particular club paid fees in return for club merchandise but after two semesters, they have yet to receive the items.

(iii) Club vs Club
Club A rented a space owned by Club B to store their stuff. Both parties agreed that the rent should be RM300 for a period of 6 months. A year has passed, but Club A has failed to pay the agreed rent and refuses to vacate the space.

The abovementioned situations are now within the jurisdiction of *Tribunal Keadilan Mahasiswa*. For the first case, the decision of the student tribunal is proof enough for the lecturer. For the second situation, the student tribunal shall consider the claims and based on the evidence produced by both parties, has the power to order the club to honour their promise. For the third situation, the tribunal has the power to order Club A to pay the rent as agreed, together with the necessary fines.

Another example of a case handled by the tribunal involved a student complaint on her roommate. Both roommates were not on speaking terms. Both sought advice from the tribunal and the tribunal ordered the complainant to apply for change of room. With the decision awarded by the tribunal, it was cogent evidence for the complainant to change rooms and the college management had no hesitation in entertaining the request.

As per its procedure, *Tribunal Keadilan Mahasiswa* will attend to every complaint within two weeks' time. The decision of the tribunal is recorded in the register of Students' Affairs Office and the necessary actions will be taken if the related parties fail to conform with the decision made within the specified time. Moreover, if it involves financial issues of the students or clubs, the records are linked to and recorded at the Treasury Office, and once recorded, it will negatively impact the person or body involved.

Current situation

Even though *Tribunal Keadilan Mahasiswa* was initiated in 2014, many of the students are not aware of this channel being available as a dispute settlement mechanism for their grievances. The complaint would have to be done manually, that is, by way of approaching any members of the *Tribunal Keadilan Mahasiswa* and filling in the complaint form. As proof, throughout the five years of its establishment (2014–2019), there had only been three cases brought before the tribunal. Thus, the tribunal, with the advice of their Board of Directors established "e-Justice" as a way of reaching out to the students.

e-Justice is a digital complaint platform implemented to help students who are seeking to resolve matters as described earlier. Students who seek assistance in any of the matters within jurisdiction of the *Tribunal Keadilan Mahasiswa* may scan the QR Code or lodge their complaint via the e-Justice official link.

Salient features of e-Justice

Presently, most of students in the public or private institutions were born in 2000 and onwards. Thus, they are 21st century generation who "live and breathe" the internet and are very comfortable and dependent on the internet and social media. According to the Malaysian Communication and Multimedia Commission's (MCMC) report, *Internet Users Survey 2018*, the internet has become a pivotal medium for social engagement, with 96.5% usage of text communication and 85.6% social networking platform visits. Besides that, the smartphone remains the most common device used to access the internet at 93.1%.

It should be noted that QR codes or links are easily shared via WhatsApp and other text communication and social networking platforms. This is because, before the initiation of e-Justice, a student complainant would have to contact any of the members of *Tribunal Keadilan Mahasiswa* and set up an appointment to discuss disputes. The complaint will be recorded, and a date of meeting will be given. With e-Justice, the student complainant can easily scan the QR code or click on the link shared via text communication platforms such as WhatsApp and Telegram and fill in the form online. The standard procedure for e-Justice is shown in Figure 1.

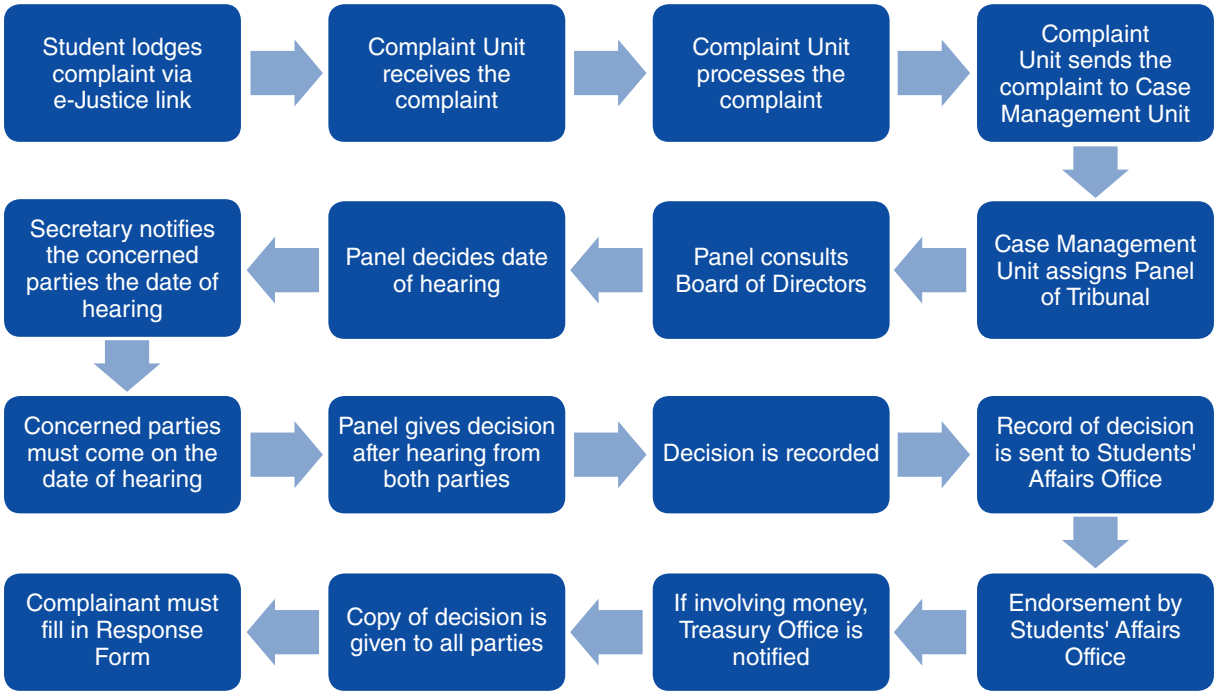

Figure 1. Standard procedure of e-Justice system

Benefits of e-Justice

There are many benefits of e-Justice. Firstly, e-Justice is a better way of engaging with students who are accustomed to the digital society that communicates through various communication applications. According to MCMC's *Internet Users Survey 2018*, there were around 27.8 million users of communication apps in 2018. Amongst these apps, WhatsApp was the most preferred apps with 98.1% users owning an account. Therefore, sharing weblinks via WhatsApp is one of the brilliant ways of approaching students.

Secondly, another function of e-Justice is to increase awareness amongst students of their rights via awareness posts on the *Tribunal Keadilan Mahasiswa's* Facebook and Instagram official accounts. These two social media platforms are used as they are the most preferred and popular amongst netizens. According to MCMC's *Internet Users Survey 2018*, there were about 24.6 million social networking users in 2018, with 97.3% of them owning Facebook accounts, 57.0% owning Instagram accounts, and 48.3% owning YouTube accounts. Through the tribunal's social media accounts, students are constantly reminded of their roles as students, their responsibilities to adhere to rules and regulations, as well as other community service and friendly reminders.

Thirdly, e-Justice is better equipped in assisting the Students' Affairs Department and Student Disciplinary Committee to manage student disputes. Besides, when students refer to their peers to settle their grievances, there are less likely perceptions of disparities as compared to if the institution were handling the complaints. Furthermore, if there are any complicated issues, the Board of Directors is available to assist on legal and non-legal aspects.

Fourthly, e-Justice's role as a mediator in student dispute settlements is through proper channels. Records of complaints as well as decisions are kept in a proper *Tribunal Keadilan Mahasiswa* register for reference and audit purposes. The student complainant also has an opportunity to rate and give feedback on the e-Justice through the Response Form after their complaint has been resolved. Based on the feedback, *Tribunal Keadilan Mahasiswa* may improve their services in the future.

Finally, the decision of the tribunal is binding, recorded, and accepted by the Students' Affairs Office. Failure to comply with the decision of the tribunal will affect the student's clearance process upon graduation. This is because, a decision of the tribunal is as good as a decision granted by the court.

Limitations

Despite the benefits afforded by the *Tribunal Keadilan Mahasiswa*, there are certain limitations in terms of its implementation. Firstly, the tribunal's jurisdiction is restricted to students only and does not extend to outsiders. For example, if a student has a problem with the college canteen operator, he/she must complain to the college office. The tribunal has no power to hear the case as the canteen operator is not a student. Similarly, if a dispute involves a student tenant and his/her landlord, or a student with any staff.

Secondly, the tribunal is currently operating in Universiti Teknologi MARA Cawangan Terengganu, Dungun Campus. Even though the tribunal has extended its services to the Bukit Besi and Kuala Terengganu campuses, its operation is limited as the Board of Directors are all based at the Dungun Campus. There are no qualified staff to become members of the board at both campuses since the position requires someone with a legal background. Furthermore, the student members of the *Tribunal Keadilan Mahasiswa* at the other campuses also find it difficult to attend courses and modules organised by the Board in Dungun as the campuses are located far from one another.

Thirdly, as the tribunal is founded and implemented in Universiti Teknologi MARA Cawangan Terengganu only, its jurisdiction does not extend to students from other campuses, as well as other universities.

Fourthly, the establishment and expansion of *Tribunal Keadilan Mahasiswa* must follow the Educational Institutions (Discipline) Act 1976 (Act 174) which only covers Universiti Teknologi Mara (UiTM) as well as all polytechnics and teachers' colleges under the Ministry of Higher Education.

CONCLUSION

Based on the above discussion, a students' tribunal is one of the mechanisms in alternative dispute resolution (ADR) which can be achieved through the e-Justice system. The workings and practices of ADR offer valuable exposure to students of higher education. Thus, a students' tribunal acts as a significant apparatus in student empowerment. Further, the establishment of e-Justice is very timely as enables students to make any complaint at any time.

Proper ADR on campus is important to avoid matters from being brought outside the perimeter of the campus. For example, filling a complaint with enforcement authorities, such as the police, will result in external interventions for issues that could have been resolved internally. Other than that, manifesting resentment on the social media may tarnish the university's reputation, which may result in the student facing disciplinary charges.

In summary, e-Justice is the first complaint channel used in UiTM Cawangan Terengganu, whose copyright is owned by *Badan Keadilan Mahasiswa*, UiTM Cawangan Terengganu and will be registered under the Research Innovation Business Unit. Presently, *Tribunal Keadilan Mahasiswa* is working on developing an official YouTube channel and is outlining a proposal to broadcast weekly on the campus radio. The unit is also working on a draft mobile application of the e-Justice system which can serve all higher education students in the future.

Finally, it is recommended that other higher education institutions too embark on a similar complaint system for students as this initiative is not only beneficial to the institution and its students, but also to other related stakeholders.

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#Bajet2020 on Twitter: Issues, personalities and sentiments

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ABSTRACT

The tabling of a budget is an anticipated political event. 2020 Budget was the second Federal budget by the Pakatan Harapan (PH) government since it came to power. The event was not only reported live by the news media, but discussion of the budget also expanded to the social media sphere with apparent critiques and comments by social media users. The objective of this study is to identify the issues, personalities, and sentiments revolving around the discussion of the 2020 Budget on Twitter. The data was collected under the hashtag #Bajet2020 on Twitter from October 11, 2019 to October 14, 2019; a 4-day timeline including the day of the budget tabling and the three subsequent days. These dates are considered crucial in gauging public perception especially since the practice of live-tweeting of an event on Twitter has gained importance as a real-time information sharing media. A qualitative content analysis was used to identify issues and personalities, while sentiment analysis was used to analyse the sentiment towards the issue. This study found that topics such as the burden faced by young people, affordable housing, petrol subsidy, long-term prosperity of the *rakyat*, income of the majority, tax system, and the abolishment of tolls were among the issues discussed on Twitter. It was discovered that the majority of the sentiments surrounding the issues was negative and that most of the personalities mentioned were political leaders. The findings of the study suggest that there is a need for the management of reputation and impression by political institutions in the social media sphere.

Keywords: ***Social media sphere, political communication, budget, economy, sentiment***

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INTRODUCTION

In the present day, politics is not solely presented through elections, politicians' speeches, or public protests. Political practices are now adopted into digital platforms where there is an increasing number of social media users. Online discussions allow political concerns to be debated, critiqued, supported or challenged. Issues of importance may differ from one user to another, influenced by their own personal interests and views. Nevertheless, the mainstream media coverage of news and politics remains important to social media activity surrounding these topics (Highfield, 2016).

The use of Twitter as a backchannel for media events, including televised political programming highlights this dynamic. Thus it is possible that audiences are consuming two or more forms of media at once. A person could be watching political television content on mainstream media while engaging in a discussion on social media by posting or uploading real-time commentaries. The ability of microblog sites to disseminate information among social networks has had a profound impact on traditional media's agenda setting power, giving rise to research on intermedia agenda setting (Wu, Atkin, Mou, Lin, & Lau, 2013). Wu et al. (2013) also found a strong relationship between the media and public agendas. Political blogging puts pressure on the mainstream media, forcing them to pay more attention to certain issues. In this regard, Tran (2014) described non-traditional platforms such as the social media as fire starters or shapers of media agendas in subtle ways.

Over the years, a number of markers has been introduced specifically relating to political themes. For instance, in the U.S., #POTUS is a marker used to discuss a particular political actor, the President of the United States. Malaysia has also experienced online political discussions with the hashtags #1Malaysia and #PRU13, to name a few. During the recent 2020 Budget tabling, a number of hashtags such as #Belanjawan2020, #Budget2020 and #Bajet2020 can be seen on Twitter. The yearly budget is reflective of the government's commitment and this was particularly important for the coalition in power since their victory in the 14th General Election (GE14). Economic-related issues were highly of interest for *Pakatan Harapan* (PH) and were also largely marketised during their campaigns. On October 11, 2019, the then Finance Minister Lim Guan Eng tabled the 2020 Budget themed "Driving Growth and Equitable Outcomes towards Shared Prosperity" ("Govt intends to invest", 2019). Twitter users began to express their views on the budget where a mix of sentiments were observed.

Problem statement

Social media such as Twitter let millions of users share their opinions (Karami, Bennett, & He, 2018). This huge amount of data provides a great opportunity for public opinion mining. There is an expansion of political discussion through the use of hashtag #Bajet2020. Certain aspects of the budget were emphasised on Twitter. PH's manifesto was documented in the "Book of Hope: Building the Nation, Fulfilling Hopes" or also known as "*Buku Harapan*". *Buku Harapan* tackled the rising inflation, cost of living and debt in the country (Idid & Souket, 2019). PH in GE14 witnessed a high voter turnout due to widespread discontent with government policies such as Goods and Services Tax (GST), misconduct of government officers, perceived inequality and various frustrations that were actively discussed on social networking sites (Hassim, Zian, & Jayasainan, 2020). A couple of months after PH's victory, Tun Mahathir stated that, "Manifesto is not a Bible. Sometimes we can do things, sometimes we find that we cannot, so we have to be practically minded" ("Manifesto not bible", 2018). Later, the then Finance Minister Lim Guan Eng announced that PH has delivered 60% of its manifesto ("60 pct of PH manifesto promises fulfilled", 2019).

This begs the question of whether this 60% accomplishment is reflected at the grassroots, particularly among the public on social media. Were the feedbacks delivered to the relevant political institutions and their leaders? What was the overall sentiment towards the issues? Hence, this study aims to identify the issues discussed on Twitter, the sentiment towards the issues, as well as the personalities mentioned in the discussion of 2020 Budget on Twitter.

Research objectives

The research was conducted to achieve three main objectives:

RO1: To identify the issues in 2020 Budget on Twitter.

RO2: To identify personalities associated with the 2020 Budget discussion on Twitter.

RO3: To examine the sentiment of the issues discussed on Twitter.

LITERATURE REVIEW

The role of social media was underscored by Stieglitz and Dang-Xuan (2012) in which the two authors depicted social media as an enabler for participation and democracy. The internet has allowed people to search for information and engage in discussions beyond the mass media. Aruguete (2017), however noted that the advancement of new communication technologies as well as the ability to consume information at the same time it is produced, does not guarantee the democratic and participative flow of information.

Internet users are not only consumers but are also capable of publishing their own content. User-generated content may fill in what is left out by professional media and even set off media coverage (Tran, 2014). This means that internet users can cooperate, share content, socialise, and network with other users (Vergeer & Herman, 2013). For this reason, sharing information on the internet may not necessarily be accurate and unbiased. As users candidly share their opinions, this could be a disadvantage of social media, especially for political information gathering. According to Halberstam and Knight (2016), the internet leads users to avoiding opinion-challenging content and only conform to information that confirms users' existing points of view.

The same can be said for the political communication landscape in Malaysia. New media developments may pose political challenges. Leong (2015) who described blogs and websites as platforms to issue statements or archive events contended that the old ways of blogs and websites have been replaced by conversations on social media. Leong also highlighted on users' preference for two-way communication; both engagement and discussion. The author suggested that due to the ability of social media to accommodate the two-way style of communication, it has become an important element in publicity, promotion, and political persuasion.

New media is used in online political engagement and advocacy as a space for information sharing and information seeking especially for youth (Akmal & Salman, 2015). Twitter is one of the many applications through new media platforms. Hong and Nadler (2011) studied the impact of Twitter in political discourse and its potential to drive public participation in politics. Political communication on Twitter could demonstrate how the voices of powerful individuals and groups in politics are represented in the form of everyday speech (Kasmani, 2019). However, it must be acknowledged that the political discourse on Twitter involves a wide field of politics which includes propaganda, campaigning and influencing or being influenced by citizens or public opinion.

Weber, Garimella, and Teka (2013) analysed Twitter's function in engaging users in political debates and illustrated the important role hashtags play on Twitter as labels for other users to follow ongoing debates. Conover et al. (2011) defined political communication as any tweet containing at least one politically relevant hashtag. Gaffney (2010) studied Twitter use during the 2009 Iran elections by tracking the use of the #IranElection hashtag. The author, however stated that it was difficult to say with any certainty what the role of Twitter was. Raamkumar (2016) analysed the use of the hashtag #Singapore on Twitter. Findings of the study indicate the role of hashtag in capturing the themes behind tweets which covered local events, local news, users' current location and landmark related information sharing.

In a study by Small (2011), the analysis revealed that the primary function of a political hashtag is to inform. It may not provide a forum for political discussion but it still works as a platform for political expression. For example, in the case of Malaysia, #PRU13 was the most prominent Malaysian political hashtag used. The hashtag fostered a diverse interaction among elected representatives, journalists, individual bloggers and interest groups (Kasmani, Sabran, & Ramle, 2014). During the election, the marker #PRU13 became a central hashtag for political discussions which contributed to a hashtag debate that is visible to all users.

In the context of the 2009 German Federal Election, Tumasjan, Sprenger, Sandner, and Welpe (2011) observed that party mentions accurately reflected the election result. This suggests that microblogging messages on Twitter mirrored the political landscape offline and can be used to predict election results. However, Hong and Nadler (2011) found that there is little evidence on whether political use of Twitter has either positive or negative impact on public opinion. Nevertheless, due to the influence of social media on public agenda, politicians should keep abreast with political discussions on social media (Salman, Mustaffa, Salleh, & Ali, 2016).

Teik (2013) traced that a commitment towards socio-economic development may have an influence in voters' decision. This was then supported by Lee (2019) who conducted a study to examine economic and non-economic factors that determined the outcomes of the 14th General Election in Malaysia. Based on the research, it was found that the two issues influencing the decline of voters' support were unemployment and inequality issues. Meanwhile, a study by Nadzri (2018) identified the issues of high cost of living, the introduction of GST and management of 1MDB were some of the fundamental issues surrounding Najib's second term of administration. Voters' economic concerns were also reflected in Merdeka Centre's *National Public Opinion Survey on Economic Hardship Indicators* (2017) as the survey revealed rising cost of living, economic hardship, employment issues and other related matters as the topmost concerns voiced by 72% of voters across the country.

Karami et al. (2018) studied about public opinion on Twitter, particularly on economic issues during the U.S. Presidential Election. Employment was the most important issue while taxes were found to be the least important issue for the followers of the two presidential candidates. The study indicated that the winner had an advantage on the most important economic issues in the election. Based on the political tweets categorised by Casero-Ripolles, Sintes-Olivella, and Franch (2017), with regard to the subject of economy, the author listed issues on public spending, taxes, salaries, jobs, unemployment, deficit, and debt. Pardos-Pardo and Sagarzadu (2018) also studied the influence of public opinion on representation of issues among political parties in Spain. The study highlighted that opposition parties tend to highlight economic issues. Thus, the result of an election can also be influenced by public opinion on economic performance.

Content analysis on social media could be aimed at understanding what kind of messages evoke interaction. For this reason, Stieglitz and Dang-Xuan (2012) described three categories for content analysis of social media which include the topic and issue category. It is possible to determine the presence of a political conversation by using a range of subjects. For example, in their study, Casero-Ripolles et al. (2017) found political tweets related to social policy, sport and culture, infrastructure, corruption, democracy, electoral and voting results, and foreign affairs. While these issues could potentially affect the outcome of an election, it should also be considered that identifying political issues or topics are equally important in crisis management and response as these issues contain conflict potential and may evolve to a crisis. A content analysis conducted by Beers (2014) found that the most frequently discussed issue was elections and the third most discussed was political coalitions among Indonesian political parties in the Twitter-sphere.

Even if the issue or topic at hand is not political in the sense of budget negotiations or election debates, these issues still have a direct, personal impact or connection. Highfield (2016) underscored that debates around vaccination, refugees and asylum seekers or climate change are demonstrative of topics that receive long-running coverage and campaigning. However, levels of engagement may vary dependent on current events and catalysts for new discussions. Highfield also suggested that the behaviours, topics, groups, and discussions facilitated by social media platforms reflect various elements of formal and informal politics. This could be understood as political themes emerging within other discussions and conversations about different subjects.

METHODOLOGY

The data gathered for the study focused on Twitter posts under the hashtag #Bajet2020. Twitter's advanced search option was used to collect the tweets manually. Using advanced search options, only tweets using the specific hashtag were retrieved to comprise the corpora for this study.

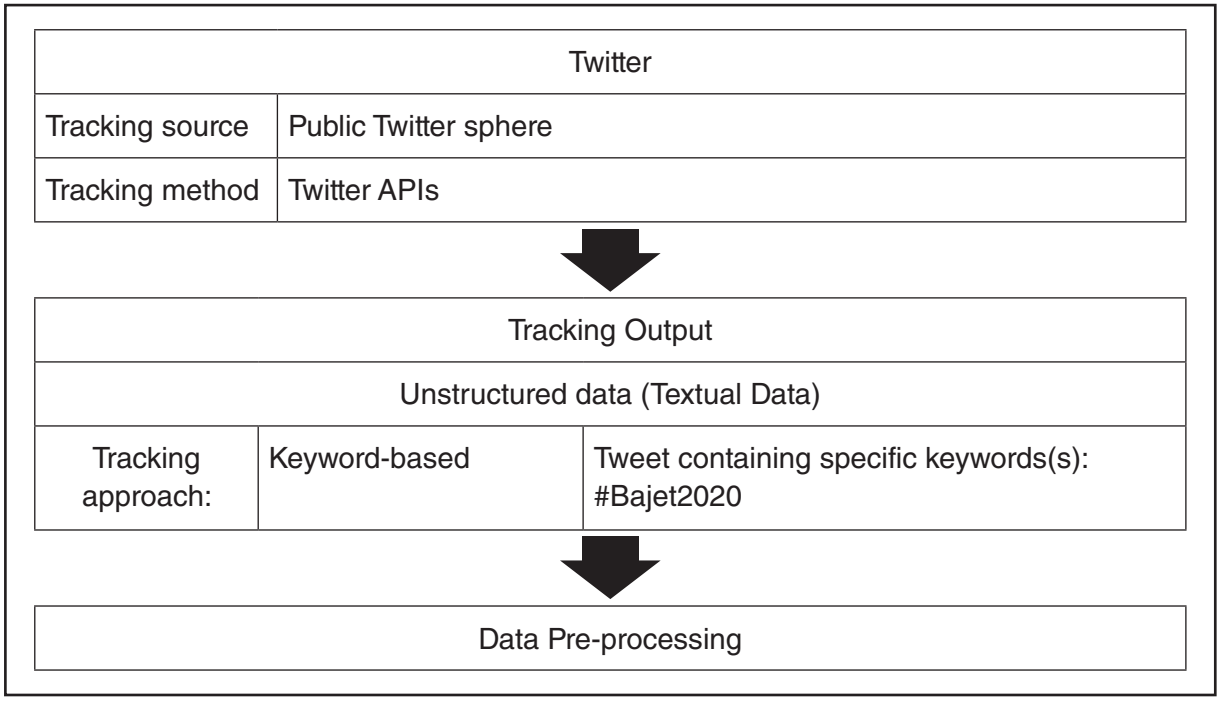

Figure 1. Adopted social media analytics framework

The social media analytics framework (Figure 1) was adopted from Stieglitz and Dang-Xuan (2012). The two authors outlined appropriate methods and techniques for conducting politically relevant analyses. The guideline serves as "a kind of guideline for the development of toolsets aiming at collecting, storing, monitoring, analysing, and summarising politically relevant user-generated content from social media for political institutions" (Stieglitz & Dang-Xuan, 2012). The framework adopted fulfils the two major parts of this study: data tracking and data analysis.

The framework suggests that user-generated data from different social media platforms can be tracked and monitored while the data analysis of the framework proposed various analysis methods for different analysis purposes and approaches. The data tracked and monitored are from public tweets that originate from public profiles.

When collecting the data, the researchers collected the content and also username. The framework proposed by Stieglitz and Dang-Xuan coined five different approaches for data tracking: self-involved, keyword/topic-based, actor-based, random/exploratory, and URL-based. For this research, the keyword/topic-based approach was employed. The approach was appropriate as it allowed keywords related to the topic of interest to be tracked. A list of relevant keywords related to the 2020 Budget event was systematically chosen in advance. Since the study focused on the 2020 budget and whether it was reflective of the manifesto, *Buku Harapan* was an integral document in determining the keywords. Once the keywords were identified, the list was used as a parameter guideline. Only tweets with the hashtag #Bajet2020 were considered for this research and was further narrowed to tweets which had the keywords reflected in *Buku Harapan*.

Out of the five pillars outlined in the manifesto, only two pillars were made a focus in this study. Pillar 1 and 3 of the *Buku Harapan* were selected due to its relevance in the economic agenda as opposed to Pillar 2, 4 and 5 which emphasised more on governance and political reform agenda. The agenda under Pillar 1 and 3 are as illustrated in Table 1. Listing down the agenda, however was not sufficient to understand the issue. The authors outlined a list of keywords to identify the issues in a topic. The keywords listed in Table 2 are a mix of words and phrases in English and Bahasa Malaysia.

Table 1. Pillar 1 and 3 of the Buku Harapan

Pillars	Agenda
Pillar 1: Reduce the people's burden	1. Abolish GST 2. Reduce the pressures causing burdensome price increases 3. Sharing the nation's wealth in a targeted and equitable way 4. Increase the number of affordable housing for purchase and rental 5. Reduce the burdens faced by young people 6. Abolish tolls 7. Provide targeted petrol subsidies 8. Improving the quality and coverage of public transport 9. Improve access to and quality of health services 10. Guarantee people's basic food needs and taking care of the welfare of the farmers
Pillar 3: Spur sustainable and equitable economic growth	1. Support the economic growth of Bumiputera and all citizens in the country 2. Spur investment and simplify business processes and trade

Table 1. (con't)

Pillars	Agenda
	3. Introduce a tax system that is people-friendly and entrepreneur-friendly 4. Set up Equal Opportunity Commission 5. Enhance the income of the majority 6. Raising the dignity of workers and creating more quality jobs 7. Implementing EPF scheme for housewives 8. Ensuring the long-term prosperity of the *rakyat*/ people 9. Advancing the interests of *Orang Asal* in Peninsular Malaysia 10. Balancing economic growth with environmental protection

Table 2. Category label and keywords used to identify issues in a topic

Category label	Keywords to identify issues in a topic
Affordable housing	*"harga" "rumah" "kondo" "pangsapuri" "hartanah" "warga asing" "orang asing" "orang luar" "beli" "mampu" "mampu milik"* "rent-to-own" *"pemilikan" "pemaju"* "developer" *"kawal" "bantuan" "pembiayaan" "sewa"*
Burdens faced by young people	*"PTPTN" "mahasiswa" "mansuh" "anak muda" "kerja" "pendapatan" "peluang"*
Abolish tolls	*"tol" "mansuh" "PLUS" "konsensi"*
Petrol subsidy	*"subsidi" "minyak" "petrol" "tarik" "turun"*
Quality health services	"health" "healthcare" "quality" "access" *"vaksin"*
Include a tax system that is people-friendly and entrepreneur-friendly	*"GST" "SST" "cukai" "baru"*
Enhance the income of the majority	*"pendapatan" "rendah"* "minimum" "wage"
Ensuring the long-term prosperity of the *rakyat*/people	*"hutang" hutang negara"* "1MDB" "SRC" *"hasil" "jual" "bertambah" "perbelanjaan" "defisit" "pelabur" "aset"*

This study used purposive sampling in selecting unique cases of social media posts. Therefore, public postings under the hashtag #Bajet2020 were selected as the study sample due to their significance in providing answers to the research questions.

Table 3. Sampling

Date	No of tweets	Sampling (20%)
October 11, 2019	113	23
October 12, 2019	58	12
October 13, 2019	32	6
October 14, 2019	14	3
Total No. of Tweets	**217**	**44**

The data was collected under the hashtag #Bajet2020 on Twitter from October 11, 2019 to October 14, 2019; a 4-day timeline from the day of the budget tabling and the three subsequent days. These dates were considered crucial in gauging public perception especially since the practice of live-tweeting of an event on Twitter has gained importance as a real-time information sharing media. The researchers were able to extract a total

number of 217 tweets under the hashtag. The researchers then selected 20% sample of the total number of tweets from each day. About 20% of the sample were selected based on the keywords they represent in the 8 category labels, namely: affordable housing, burdens faced by young people, abolish tolls, petrol subsidy, quality health services, tax system, enhancing income of the majority, and long-term prosperity of the *rakyat*. As a result, 44 tweets were chosen as they fit the categories determined earlier. Based on these data sets, a content analysis was conducted on ATLAS.ti to identify major topics and users' sentiment associated with those topics.

FINDINGS

Issues discussed on Twitter

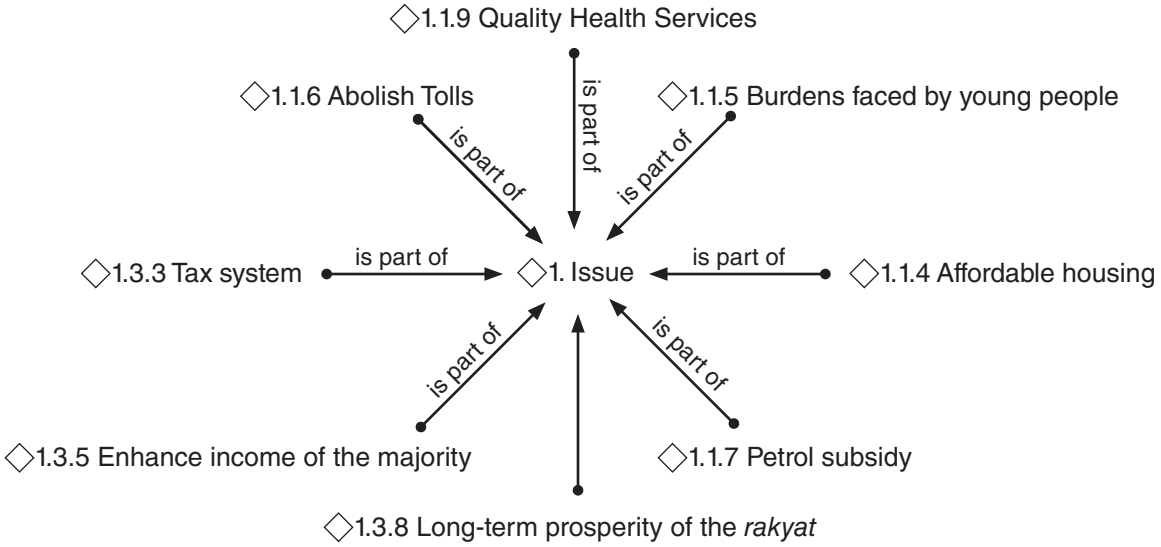

Figure 2. Topics identified in the tweets

As shown in Figure 2, the issues discussed on Twitter under the hashtag #Bajet2020 were affordable housing, burdens faced by young people, abolishment of tolls, petrol subsidy, quality health services, enhancing income of the majority, tax system and long-term prosperity of the people.

Affordable housing

On the topic of affordable housing, among the issues raised was home purchase and ownership. In some of the tweets, users have described the difficulty of owning a home. Admittedly, developers are facing issues in selling houses too. During the tabling of the 2020 Budget, it was announced that the government aimed to reduce the supply overhang of condominiums and apartments amounting to RM8.3 billion in the second quarter of 2019 by lowering the threshold on high-rise property prices in urban areas for foreign ownership from RM1 million to RM600,000 in 2020.

However, this received a backlash from the public on Twitter. Mostly, they were wary of foreigners monopolising properties in Malaysia. This issue can be seen raised in a tweet by user @duniatiger, "*Foreigners can now buy property priced at RM600,000 in Malaysia. Wow. Sell everything to foreigners. #Bajet2020*". Some were of the opinion that the lowering of threshold would only benefit the developers. Twitter user @SyakirWazir tweeted: "*Good for developers, but not us… Not us… #Bajet2020*".

Burdens faced by young people

As politically marketised in *Buku Harapan*, the coalition announced their commitment to reducing the burdens faced by young people by creating more high-quality and well-paying jobs that are suited to their qualifications. Under the topic of burdens faced by young people, the study discovered three major issues: unemployment, PTPTN, and sustainability of the Malaysian@Work programme.

A tweet by the Twitter user @nipa_wiggins displayed concerns on unemployment among graduates. To quote the user's tweet, "*Many are not working. No job opportunities. Graduates are unemployed. Government #Bajet2020 is incentivizing RM500 a month. Where does the 350,000 job opportunities come from?*". The Malaysian@Work programme had sceptical netizens talking as well. @imanmukhlis tweeted: "*I'm so afraid with the sustainability of this paying employer to hire employee. #Bajet2020 #malaysiakerja*".

Abolishment of tolls

Under the topic of abolishment of tolls, the issue of discounted toll charge was widely discussed on Twitter. Many people were looking forward to the abolishment of toll, however, in the 2020 Budget table, it was only announced that there will be an 18% discount. Twitter user @abdulshamin tweeted: "*Steady. Toll has been abolished. Oops. 18% discount only. Hmmm #Bajet2020*".

Petrol subsidy

Pakatan Harapan in its manifesto had promised to provide targeted petrol subsidy. During the tabling of the 2020 Budget, it was announced that for eligible recipients of the *Bantuan Sara Hidup* (BSH), the petrol subsidy receivable will be RM30 per month for car owners and RM12 per month for motorcycle owners. Twitter user @woody2shoez tweeted: "*Can't believe I actually heard the budget presentation the entire drive home from work. I think there were a lot of goodies for the people. Liking the targeted subsidies via the Bantuan Sara Hidup for the B40. #concernedcitizen #Bajet2020*". While the tweet sounded optimistic, another user, @ied_17 was of the opinion, "*Offer subsidy in the form of money instead of oil. (When) oil prices go up, prices of goods and services go up as well. (But) when oil prices dropped in the past, did we see prices of goods reduced? #Bajet2020 #excessiveprofittaking*".

Quality health services

The issues discussed under the topic quality health services were mostly on the pneumococcal vaccination. The initiative was well-received by the public on Twitter. In some of the tweets, users were praising the National Immunisation Programme. @khairulhafiz_m tweeted: "*This is one of the best initiatives. The Rakyat is currently paying RM 250-300 for the pneumococcal vaccine. Not many parents can afford that. Thank you @DrDzul #Bajet2020*". The positive reaction was also shared by another Twitter user, @aiman0802: "*Glad to know that the pneumococcal vaccine is now free and included in our National Immunization Schedule. Also, bigger budget for healthcare! Happy to hear the #Bajet2020 just now*".

Enhancing the income of the majority

There were mixed opinions on the minimum wage announced. One optimistic user, @aizad_z, tweeted: "*Increasing the minimum wage is a good news. #Bajet2020*". Twitter user @ismet_ulam on the other hand tweeted: "*The cost of living was only mentioned once in the 2020 Budget speech. Is it not important anymore when in fact cost of living is rising? The minimum wage promise is a big lie*".

Tax system

Some of the concerns raised were related to how the government will keep up with the growing expenditure. It was speculated that in order to keep up with the economy, the government might implement a new tax system. @KBhensem tweeted: "*What's worrying is that with the announcement of incentives and increase of the budget, under the current economic condition, it is possible that a new tax system would be introduced to increase national income*".

Long-term prosperity of the people

The discussion on the long-term prosperity of the people or *rakyat* revolved heavily around investments and national debt level. The political party, Malaysia Chinese Association (MCA) tweeted: "*Asset has been sold off but debt level is still high. #Bajet2020 #Belanjawan2020 #2020Budget*". Twitter user @azmyklanajaya also expressed his concern over the nation's debt. The user wrote in a tweet: "*2020 Budget is a deficit budget. Deficit here means that expenditure will be higher than income. It is likely that the national debt will grow to RM 1 trillion as reported by PH before this*".

Table 4. Summary of issues discussed on Twitter

Topic	Summary of issue
Burdens faced by young people	• PTPTN • Unemployment among graduates • Sustainability of the Malaysian@Work programme
Abolish tolls	• 18% discount instead of abolishment
Petrol subsidy	• Targeted petrol subsidy for eligible recipients of BSH
Affordable housing	• Threshold on high-rise property prices for foreign ownership lowered from RM1 million to RM600,000 • Only benefit the developers
Quality health services	• RM60 million allocated for pneumococcal vaccination • Pneumococcal vaccination included in the National Immunisation Schedule
Tax system	• Likelihood of implementation of new tax system to cover expenditure
Enhance income of the majority	• Rising income inequality • Minimum wage
Long-term prosperity of the *rakyat*	• Investments are expenditure • Increase in national debt level

Personalities mentioned in the tweets

To answer the research question on identifying personalities associated with the 2020 Budget discussion on Twitter, the study looked into usernames mentioned by the public on Twitter and the topics they were mentioned in. It was discovered that the personalities mentioned in the tweets were political leaders from both government and opposition camps.

Table 5. Summary of personalities mentioned in a topic

Personality	Topic
Lim Guan Eng (@guanenglim)	Petrol subsidy Burden of young people
Najib Razak (@NajibRazak)	Long-term prosperity of the *rakyat*
Mohamad Hasan (@tokmatn9)	Petrol subsidy
Zahid Hamidi (@Zahid_Hamidi)	Petrol subsidy

Table 5. (con't)

Personality	Topic
Ahmad Maslan (@ahmadmaslan)	Petrol subsidy
Dr Dzulkefly (@DrDzul)	Quality health services
Syed Saddiq (@SyedSaddiq)	Affordable housing

Social media platforms may bridge the communication gap between citizens and politicians. The public could benefit from the mention feature on Twitter in engaging politicians. However, this does not guarantee a response from them. While the intended person might not react, the interactive nature of the medium makes it possible for a public debate to take place. A lengthy and publicly visible discussion could develop when users respond and discuss the issue even without the participation of the personality mentioned. So, while there may still be a communication gap between citizens and politicians, this dialogic strategy allows the public to respond to the replies from other users, enabling wider discussions. Indirectly, messages intended for other users on Twitter may also influence other people on the platform as people try to gather more information about an issue.

Sentiment towards the issues discussed

Social media enables people to express their views, opinions or emotions on almost anything. It is important for political institutions to be able to gauge public sentiment (positive, negative or neutral emotions) or opinions on certain political topics as found and discussed in the subsequent sections.

Positive

Among all of the topics discussed under the hashtag, the topic of quality healthcare service received the most positive feedback from the people. In the 2020 Budget, it was announced that the government will be allocating RM60 million for the pneumococcal vaccine and making it compulsory through the National Immunisation Programme. Free vaccination means more people could have access to it. A positive sentiment will create a positive priming effect where leaders are judged based on their kept promises and strong political will. Positive sentiment towards an issue is determined through the tone and choice of words. "Like", "glad", "good news" and "love" were among the words found used to express emotions in a positive tone. For instance, @aiman0802 tweeted that he was "*glad to know that the pneumococcal vaccine is now free and included in our National Immunization Schedule. Also, bigger budget for healthcare! Happy to hear the #Bajet2020 just now*".

Negative

Topics such as burdens faced by young people, abolishment of tolls, affordable housing, tax system and the long-term prosperity of the *rakyat* were viewed negatively on Twitter. Opposition politicians also took the opportunity to deliver their tweets in certain narrative styles. In a tweet by Ahmad Maslan, who was a member of parliament of the opposition camp, the tweet displayed the use of communication style known as "opinion by satire".

Sukmayadi, Suryadi, and Rouf (2019) identified this as the most dominant style used by opposition politicians. This strategy involves the use of humour, exaggeration, irony, or ridicule to expose and criticise in a loud but implicit manner. @ahmadmaslan tweeted: "*Not once in the #Bajet2020 the #PTPTN manifesto was mentioned. Before this in #PRU14 they have been campaigning about the PTPTN, but now it seems like it has been forgotten. Not once mentioned in the budget @guaenglim*".

Neutral

An issue could also be determined as neutral when a tweet has two premises. This could be detected in the use of conjunctive adverbs such as "however" and "but". The following tweet by @KBhensem displayed a neutral sentiment: "*First impression for #Bajet2020, rhetorical budget with unknown economic consequences. But with the youth empowerment incentive, I hope we are walking in the right direction. #BelanjawanAnakMuda2020*". A topic was also categorised as neutral when the tweets collected under the topic had a mix of positive and negative reactions by the public on Twitter.

Table 6. Summary of sentiment towards the issues discussed

Issues	Keyword	Sentiment
Burdens faced by young people	*"ramai orang tak kerja"* *"afraid with the sustainability"*	Negative
Abolish tolls	*"Diskaun 18% je"* *"Tol yang sebelum ini janji dihapuskan, tidak akan dihapus rupanya"*	Negative
Petrol subsidy	*"bajet menyindir rakyat"* (Negative) *"liking the targeted subsidy"* (Positive)	Neutral
Affordable housing	*"orang asing dah boleh beli hartanah"* *"selesaikan isu penjualan rumah bukan pemilikan rumah"* *"paling tidak boleh diterima"*	Negative
Quality health services	*"what I love about #Bajet2020 is vaksin pneumococcal"* *"glad to know that pneumococcal vaccine dah bagi free"* *"Antara paling power"*	Positive
Enhancing income of the majority	*"Janji gaji minimum ni memang antara 'kencing' paling power"* (Negative) *"Increasing the minimum wage is a good news"* (Positive)	Neutral
Tax system	*"menimbulkan kecurigaan terhadap kemampuan kerajaan merealisasikan semua peruntukan berdasarkan sumber lain termasuk kenaikan cukai atau mewujudkan cukai baharu"* *"berderet PH susun cukai baru"*	Negative
Long-term prosperity of the *rakyat*	*"Investment and investment and more investment. Come on give me something…"* *"Aset dijual, tetapi hutang masih tak turun-turun"*	Negative

It was observed that the majority of the sentiments towards the issues were negative. Negative sentiments could reveal political dissatisfaction among netizens on a particular issue.

DISCUSSION

Issues identified in the topics discussed

Issues in a tweet refers to the identification of topic of a tweet. This is to determine the presence of a political conversation by using a range of subjects. Through the content analysis, the researchers were able to identify the issues discussed. The study looked into Pillar 1 and Pillar 3 of *Buku Harapan* which focused on reducing people's burden, and sustainable and equitable economic growth, respectively. The researchers found that burdens faced by young people, abolishment of tolls, petrol subsidy, affordable housing,

quality health services, tax system, income of the majority, and long-term prosperity of the *rakyat* were among the topics discussed on Twitter. Overall, unemployment, PTPTN, discounted toll fees, home-ownership versus home-purchasing, targeted subsidy petrol, budget deficit, the national debt level, minimum wage, and the worry of having to pay more taxes were among the issues discussed on Twitter.

Diamond (2010) argued that the internet enables citizens to scrutinise the government, express opinions, and monitor elections. As soon as the budget was announced, netizens expressed their opinions of the budget. This is in line with Leong (2015) who contended that the nature of new media allows netizens to immediately respond with feedback, instead of being passive recipients. This dialogic strategy is not only interactive in nature but also includes the acknowledgement of differing viewpoints (Beers, 2014). Besides that, the internet too has enabled the monitoring of elections (Diamond, 2010). However, in this study, it is observed that the monitoring process goes beyond the election process, as people were still monitoring the coalition's performance post-election.

For political institutions, learning "which issue matters" provides a leverage in political campaigns where it can be used for publicity, promotion and political persuasion. The government could also use this knowledge to their advantage and win back public confidence. Economic factors have long been considered to be important determinants of electoral outcomes (Lee, 2019). In GE14, general economic conditions such as economic growth, inflation and unemployment seemed to have a significant influence on the election.

The more exposed an issue, the more it influences people's assessment of politicians. Priming takes effect by the way of isolating and amplifying issues on social media for evaluating politicians. Social media too serves as a medium for public agenda setting. Beers (2014) described this as an issue-oriented strategy which refers to interactions about political or policy issues of public concern. In fact, today, social media, more often than not, contributes to news headlines allowing issues to be amplified, reaching a larger audience.

Personalities mentioned in the tweets

Conversations on the internet allows exchange between politicians, journalists and citizens (Leong, 2015). Mentioning other people in a tweet means involving other users. In identifying the key personalities, the researchers found that a number of politicians were put under the spotlight, thanks to some of the issues. This was identified by looking into the personalities mentioned in the tweets, either by other politicians or the general public. Politicians received mixed "mentions" on Twitter. The researchers found that the interactions under the #Bajet2020 can be categorised into interactions among politicians as well as interactions between citizens and politicians.

The study discovered the then Finance Minister Lim Guan Eng as one of the frequently mentioned personality on Twitter. He received negative mentions in the tweets. He was also frequently mentioned by the opposition politician, Ahmad Maslan. This interaction proves the argument by Leong (2015) that the internet allows exchange between politicians.

It was reflected in the study that the public, too, use Twitter to interact with politicians. Although the interactions do not necessarily indicate a political discussion, it is an adequate example to illustrate the act of political expression through direct mention of the politicians. However, the "mention" feature was not fully utilised by the citizens. The mention feature was mostly used by politicians to provoke other politicians. Even so, when a citizen did use the mention feature, it was mostly used to compliment. The mention feature should also be applied in tweets that are negative, so that politicians can learn about public opinion directly.

Sentiment towards the issues discussed

Social media rituals include the use of hashtags. Much like #PRU13, #Bajet2020 too became a central hashtag which contributed to the debate and discussion of the 2020 Budget. Hashtags may not necessarily provide an avenue for political discussion but more of a platform for political expression as highlighted by Small (2011). #Bajet2020 was used as a marker of political expression by Twitter users. Sentiment analysis or opinion mining was described by Liu (2011) as a method to study people's opinions in terms of views, attitudes, appraisals and emotions towards entities, individuals, issues, events, and topics. The researchers found that the topic of quality healthcare services to be the only topic discussed positively on Twitter. In other topics such as burdens faced by young people, income of the majority, petrol subsidy, abolishment of tolls, and the long-term prosperity of the *rakyat*, sentiments displayed were negative.

It is important for political institutions to get a good read of the prevalent sentiment (positive, negative or neutral) expressed by others about themselves as a person or organisation, as well as on certain political topics (Stieglitz & Dang-Xuan, 2012). Learning about what other people think allows the government to evaluate public confidence. Without public confidence, negative sentiments will always surround the pace of recovery. PH's victory was contributed by the rising cost of living, unemployment among graduates, rising household debt and the increasing corruption (Nambiar, 2019). Today, issues such as unemployment among graduates remain as a major concern. Thus, negative sentiment surrounding these issues might affect politicians, political parties and the criteria by which political leaders are evaluated.

CONCLUSION

As previous studies have shown in the last few years, social media has become an important political communication channel. Based on the extensive literature review, there is an increasing need to observe political discussions on various social media platforms such as Twitter and Facebook. This study followed the existing guideline of social media analytics framework. The issues discovered were reflective of the economic determinants among voters which could be used as an indicator of satisfaction or dissatisfaction towards the government.

This study established the landscape of the political discourse on Twitter in Malaysia, particularly surrounding the hashtag #Bajet2020. Although new issues may develop in the subsequent years, the study provided a baseline of issues which can be useful for both political institutions and voters. The role of social media as a medium for public agenda setting in forcing the political actor to pay attention to a specific issue should be considered. For political actors, this research yields a clearer picture of campaign strategies and political marketing used in garnering support for election and in retaining the confidence of the public. For voters, social media is a platform to band their voice together. The combination of issues identified and sentiment analysis could be further developed in mining economics-based public opinion. Future research should also explore non-economic issues such as foreign policy.

Twitter represents potential new directions in the political communication landscape. This could encourage more substantive communication strategies from political parties and foster a more rational public sphere. Due to the many political voices present on the internet, politicians and political institutions need to compete for the attention of potential voters. To do so, politicians need a leverage which is gained by identifying and

understanding prominent issues among the public. With that knowledge, politicians can start focusing on issue-based interactions. From the perspective of political institutions, this study implicates a need for reputation management in the social media sphere.

While the core discussion in this paper was based on findings specifically on the hashtag #Bajet2020, it must be noted that other variations of hashtags related to the discussion of the budget exist. Variations of the hashtag could include #budget2020, #belanjawan2020 or simply #bajet. #Belanjawan2020 resonated a tone of formality, especially since it was more visibly seen and used by media outlets and political actors alike. "*Bajet*" is a loan word from the English word, "budget". Although the researchers had the alternative of tracking "*belanjawan*" (another option for "*bajet*" in the Malay language), for the purpose of this study, "*bajet*" was selected as it was deemed more likely to be used in candid online discussions. Apart from that, other debates regarding the 2020 Budget may have taken place through non-hashtagged messages on Twitter which resulted in less visibility for those posts. Therefore, it must be emphasised that this study only offers an analysis of how Twitter users utilised the marker #Bajet2020. Another limitation of the study is that it was also conducted at the semantic level. The data were coded at face value — at the explicit or surface meaning. The study was not intended to look for anything beyond what had been said or written.

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Designing the MOOC Protocol for MyOBM260 Notes Junkie

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ABSTRACT

Numerous studies have highlighted the advantages of using an online platform as a teaching method which allows collaborations among various codes and subjects. However, to date, there has not been any standard procedure or methodology for Organizational Behaviour (OBM260) created for students majoring in Office Management Technology (OMT). Therefore, this paper presents a methodology for designing and developing MyOBM260 Notes Junkie, an online learning content of the subject using the platform of Massive Open Online Courses (MOOCs). This methodology has been developed with the intention of easing and simplifying the process of learning in an open and online environment. The incorporation of notes in the form of mind maps and other illustrations motivates and enhances students' understanding of lessons via the MOOC platform. In addition, Gagne's 9 Conditions of Learning Theory was adopted as the theoretical and pedagogical guideline in the design of MyOBM260 Notes Junkie. The novelty of MyOBM260 Notes Junkie is that it is done on the first MOOC platform available for OMT students for MyOBM260 online lessons to aid students beyond classroom settings, to promote independent learning, and to motivate their active involvement in collaborative learning.

Keywords: ***Protocol, organizational behaviour, MOOCs, note-taking, mind-mapping, online learning, self-directed learning, online collaborative learning***

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INTRODUCTION

Recently, Massive Open Online Courses (MOOC) platforms have been widely used in tertiary education that focuses on a new and innovative e-learning pedagogical approach (Atiaja & Guerrero-Proenza, 2016). MOOC platforms have attracted widespread public and academic attention by offering innovative online courses targeted at extensive collaborative involvement and released through open-access platforms on the internet (Baturay, 2015). The variety of content may include, but not limited to video-based instructions, videos, problem sets, and group forums. MOOC platforms enable the building of interactive community-based interactions for learners, lecturers, and tutors. By offering flexible learning in terms of time and place, MOOC platforms are reliant on learners' commitment in self-organising their involvement based on learning outcomes, existing comprehension and proficiencies, and mutual relevance. Further, MOOC platforms are intended to sustain the lifelong learning process, where learners may expect unlimited participation from geographically dispersed locations, involving not only students but also academics, via discussions throughout the world.

As outlined in the Malaysian Education Blueprint 2015-2025, the Ministry of Education Malaysia introduced MOOCs as one of the initiatives to help Malaysia stand on par with the global educational system (Anealka, 2018). As one of the leading educational providers in Malaysia, Universiti Teknologi MARA (UiTM) is committed to offering high-quality education through the implementation of MOOCs. Starting from a single course in 2014, it grew into four courses in 2015, and gradually became 16 courses in 2016. By 2017, UiTM had developed 450 new courses and today, over a thousand courses have been registered in MOOC repositories (Anealka, 2018). In support of UiTM's commitment to the use of MOOCs, this protocol paper presents the methodology used in the development of MyOBM260 Notes Junkie, an online learning platform designed to ease and simplify the process of learning in an open and online environment. The incorporation of notes in the form of mind maps and other illustrations motivates and enhances students' understanding of lessons via the MOOC platform.

MyOBM260 Notes Junkie was designed for flexible sharing of online lesson content with learners who enrol in the course. It provides an opportunity for learners to familiarise themselves with the necessary course content before taking comprehensive notes in class. Its emphasis is on employing effective methods to organise information, to identify and to highlight key ideas gathered in class presentations or lecture sessions through interactive note-taking applications, such as Canva. Notes has two relevant functions: for external storage and for encoding. The external storage function ensures that the learners can remember significant details, by creating a memory cache that can be referred to during revisions for examinations or for general learning. The encoding function refers to the encoding process which facilitates and increases the attention of learners during a lecture by encouraging active engagement with the course content and crucial ideas from lessons. Learners of this course are expected to use MyOBM260 Notes Junkie as a preparation tool before attending a lecture session. Notes will help them recall information and read notes from previous lectures, before class. This preparation enables learners to stay focused, to pay attention, and to engage actively with learning during lectures, whether online or face-to-face, or even during self-learning sessions.

LITERATURE REVIEW

Massive Open Online Courses (MOOCs) and MOOC protocol

The increase in worldwide demand for virtual learning has compelled the migration of many traditional classes to MOOC websites. These modules are offered online with open public access via the internet to encourage unlimited participation (Siemens, 2013; Lin & Cranton, 2015) from around the world. The courses offered in MOOCs are related to high-level academic and professional studies (Watted & Barak, 2018); hence, it is populated with adult learners, mostly university students and working adults who seek ongoing educational and professional development. Despite some emerging resistance and criticisms on the relevance and efficiency of MOOCs (Johnson & Becker, 2014; Lin & Cranton, 2015; Kang & He, 2018), it cannot be denied that MOOCs has had an unprecedented success in revolutionising higher education due to its free access, besides promoting lifelong learning among adult learners for their personal and professional development (Johnson & Becker, 2014).

The potential of MOOCs in promoting positive learning behaviours and favourable learning outcomes has been closely linked to its distinctive characteristics of being elective, autonomous, and interactive (Kang & He, 2018). With these characteristics, its pedagogical framework directly fosters self-directed learning (Lin & Cranton, 2015; Touati, 2016; Kubincová, Dale, & Kerr, 2018), self-regulated learning (Onah & Sinclair, 2017), and online and mobile collaborative learning (Brahimi & Sarirete, 2015; Harasim, 2017; Lu, Huang, Huang, & Yang, 2017; Amarasinghe, Hernández-Leo, Manathunga, & Jonsson, 2018; Lee, Leow, & Kong, 2019). Grounded on these key characteristics, the design and development of the MOOC protocol for MyOBM260 Notes Junkie was embedded with the pedagogical underpinnings of developing self-directed learning, online collaborative learning, multiple intelligences, and critical thinking through note-taking and mind-mapping skills on an online learning platform. The MOOC protocol used in the design and development of MyOBM260 was guided by Gagne's Nine Conditions of Learning Theory as well as enhanced with infographic software like Canva, and interactive multimedia such as YouTube and Powtoon to create a more vibrant and engaging learning platform for the learners.

Self-directed learning (SDL) and online collaborative learning (OCL)

Self-directed learning (SDL) has been recognised widely for its effectiveness in engaging and training adult learners since its introduction in 1967 (Boyer, Edmondson, Artis, & Fleming, 2014; Rashid & Asghar, 2016; Touati, 2016). This mode of learning has been closely linked to the learners' ability in selecting their choices and regulating their pace of learning in a way that enables and motivates them to learn better. This shift of responsibility to learn from teachers to learners in SDL was also highlighted by Tekkol and Demirel (2018). Due to its promotion of learner-centeredness and learner autonomy, SDL has been widely integrated in the instructional design and pedagogical approach of most courses for adults, such as in MOOCs. Self-directedness is especially crucial in MOOCs, as the learners are expected to identify and set their learning goals, be resourceful in finding the necessary learning materials in MOOCs, and be disciplined in completing the course within the timeline set by themselves, without any external guidance (Lin & Cranton, 2015). Therefore, for a learner to become fully self-directed, a certain level of preparedness and maturity is needed. Since the MOOC protocol designed and developed for MyOBM260 Notes Junkie predominantly caters to university students who may not have acquired the level of readiness and maturity for a full SDL, it adopted a mandated learning approach instead of a total voluntary learning endeavour by the learners.

Another learning theory in relation to tertiary education is collaborative learning. In its traditional pedagogical framework, collaborative learning "involves groups of learners working together to solve a problem, complete a task, or create a product" (Laal & Laal, 2012, p. 491; Laal, 2013, p. 815). Besides collaboration, Brandon and Hollingshead (1999, cited in Xia, 2011) proposed the communication and social contexts as two additional key elements of collaborative learning. As computer and digital technology continues to gain increasing importance and emphasis in education, collaborative learning has taken on new names like Computer-Supported Collaborative Learning (CSCL) and Online Collaborative Learning (OCL) to stay relevant in the increasingly digitised education landscape.

Close reading into scholarly works on collaborative learning shows a frequently raised concern over the inclusive use of the term "collaborative" to apply on all learner-centred and interactive learning that involves groups of learners (Zhan, 2012; Ha, Janssen, & Wubbels, 2017). In a way, self-directedness is more evident in collaborative learning as compared to cooperative learning, since in the former, learners are actively involved in common tasks in which they share knowledge and contribute to the completion of the assigned tasks in the learning process (Tan & Arshad, 2017). This justifies the conclusion made by Bruffee (1999, cited in Zhan, 2012) on the two concepts, that between the two, collaborative learning is more suitable for adult learners and university students who have the maturity to control their own learning. The MOOC protocol which has been designed and developed for MyOBM260 Notes Junkie adopted the term online collaborative learning (OCL) in its instructional design and pedagogical framework, based on the collaborative nature in learners' participation in MOOCs. The online learners' interaction in this protocol leans more towards OCL, in which unplanned learning takes place when learners communicate among themselves via the internet, unlike in the more structured group communication in online cooperative learning. Consequently, it promotes knowledge sharing among this MOOC community as the learners regularly interact with each other online (Rahmawati, Mulyana, & Safitri, 2019).

Note-taking, mind-mapping skills, and critical thinking

Note-taking has been identified as a critical study skill in higher education (Kırkgöz, 2010; Boyle & Forchelli, 2014), as university students are expected to record important points in lectures for revision and examination purposes. Learners' ability to take notes effectively and systematically has been empirically proven to be one of the requisites of academic success (Bui, Myerson, & Hale, 2013; Lee, Wang, Hamman, Hsiao, & Huang, 2013; Asci, Kulac, Sezik, Cankara, & Cicek, 2016; Almaaghbh, 2020). However, applying note-taking skills in academic settings, such as lectures has been found to be challenging for learners (Ipek, 2018). Therefore, learners need to develop and master note-taking skills through regular practice and application. As online or web-based learning is gaining more prominence in higher education, there has been a rapid conversion of course contents and lecture notes into digital forms. This requires learners to review and adjust their learning style to fit the demands of online learning, including any previous note-taking habit, which has to depart from the conventional paper and pen approach (Morehead, Dunlosky, Rawson, Blasiman, & Hollis, 2019). The instructional design of MyOBM260 Notes Junkie carries the potential of providing guidance and support to better facilitate learners' note-taking skills through a digital template of "emphasis cues" and "organisational cues" (Boyle & Forchelli, 2014) that comes in the form of short notes presented in a visually stimulating and textually efficient graphics.

Another vital study skill that has been incorporated in the MyOBM260 Notes Junkie in its MOOC protocol is mind-mapping. Ever since its introduction by Tony Buzan in the 1970s, mind-mapping has been extensively used in education of all levels, albeit it is

given more attention in higher and adult education. Primarily, mind-mapping is a graphic method, which can assist learners or users successfully in gathering and linking details, emphasising on vital themes, discovering other possibilities upon a single observation, and visualising the outlines that converts evidence from details into informative data to be kept and remembered (O'Connell, 2014). Within the context of education, Erdem (2017) posited mind-mapping as an "effective technique in the process of learning-teaching as a form of note taking" (p.2) that departs from the traditional way of note-taking. Its colourful structure with links also promotes memory, while facilitating constructivist learning (Erdem, 2017). When used efficiently, just like note-taking, mind-mapping can facilitate the learning process by helping learners retrieve, organise, review, and recall information more systematically.

The value of mind-mapping in promoting critical thinking has been investigated and confirmed in various studies. D'Antoni, Zipp, Olson, and Cahill (2010) found that mind-mapping can help medical students think critically when learning the link between basic and clinical sciences. The role of mind-mapping in promoting critical thinking in medical education was also explored by Sadik (2014). Prior to this, Lee et al. (2013) cited that mind-mapping helps develop learners' ability to reflect and evaluate existing knowledge and to exercise a higher level of critical and complex thinking. Adding to that, Susanti, Poedjiastoeti, and Taufikurohmah (2018) found that mind-mapping is a useful tool to shape learners' creative thinking, besides critical thinking. In summary, the review of the literature provides a necessary understanding of the theoretical and pedagogical frameworks that have guided the design and development of the MOOC protocol for MyOBM260 Notes Junkie.

METHODOLOGY

In 2018, Office Management & Technology (OMT) of the Management Department, Faculty of Business Management established MyOBM260 Notes Junkie MOOC as a required teaching methodology for every subject code. OBM260 is the subject code of the compulsory Organizational Behaviour course for fourth-semester students, which is a three-credit-hour core subject that covers six chapters, namely Introduction to Organizational Behaviour; Emotion and Behaviour in the Workplace; Stress Management; Motivation in the Workplace; Team Dynamics; and Power and Influence.

This MOOC was designed to assist the students in their learning using clear and easily understood course notes for the subject. In developing the MOOC, a mind-mapping technique has been embedded in the notes, making it easier for the effective delivery of the gist of the course notes. Additionally, other learning tools, such as Canva, YouTube videos, Powtoon, and Puzzle, among others, are continuously linked to the MOOC to allow more efficient and effective delivery of course notes. The incorporation of mind-mapping and learning tools into the MOOC is to enhance the learning process and to retain the focus and attention of the students on the course notes, particularly in the context of the OMT students. This approach can eventually inculcate students' experiential learning and promote self-focused learning (Chong & Teng, 2018). For this, a "storyboard" was built to set up the arrangement of the MOOC. The final set-up incorporates all materials in the MOOC platform provided by the university: https://ufuture.uitm.edu.my/login.

The development of the MOOC was in accordance with the topics, which were further chunked into several subtopics to include various activities and additional materials. The learners are able to gain access to all activities. Learners are required to complete selected tasks or activities that have been identified by the MOOC developers.

These activities or tasks are set as compulsory, and learners' participation is traced and tracked to confirm and assess their level of participation, even though they learn online remotely. Besides the activities, students' progress in learning is also ascertained through their response and feedback in two major surveys that they are required to take part in upon the completion of the MOOC. Student Exit Survey (SES) assesses their own evaluation of learning from MOOCs, while the Student Acceptance of the MOOCs Survey provides the MOOC developers with the necessary feedback from the students, who are also the end users of MOOCs, in terms of their overall satisfaction. These two surveys are key check-and-balance mechanisms that allow developers to evaluate the effectiveness and efficiency of the MOOC in order to optimise this learning platform for the benefit of the students.

The design of this MOOC was guided by Gagne's Nine Conditions of Learning Theory, which validates the MOOC's theoretical and pedagogical framework, besides being a systematic and useful guide for the developers. In general, Gagne's model explains the way information is interpreted, which involves social awareness (Miner, Mallow, Theeke, & Barnes, 2015). Past research indicate the need for quality assessments to assess content and resource design, and to connect learners with content and resources (Dillenbourg, Fox, Kirchner, Mitchell, & Wirsing, 2014). In MOOC, therefore, Gagne's Nine Condition Learning Theory was used in the design and content of lessons to engage learners. The framework of MOOC was arranged according to Gagne's Nine Events of Instruction, which involve (a) gaining learners' attentiveness; (b) informing lesson objectives to learners; (c) stimulating recollection of previous learning; (d) presenting stimuli with idiosyncratic characteristics; (e) providing guidance to learners; (f) prompting performance; (g) providing constructive responses; (h) evaluating performance; and (i) improving preservation and transmission of knowledge (Miner et al., 2015).

Before the MOOC was opened for registration, the OBM260 notes were designed and creatively arranged using Canva to map them in detailed yet simplified versions. The gist of every topic in OBM260 was embedded into mind maps with visual illustrations and pictures that help elaborate the notes clearly. The content of the mind maps was inclusive of each subtopic's keywords to facilitate students' memorisation. The materials and arrangement of notes were organised according to the syllabus of the subject in order to adhere to the faculty's requirement. Additionally, these steps ensured that the OMT students can obtain, share, use, and store information provided in the mind maps for their learning purposes, and subsequently use the information in their quizzes and examinations. Table 1 shows how the Gagne model was used to guide the arrangement of the MOOC.

Table 1. Gagne's Nine Conditions of Learning's guide on the basic design of the MOOCs

Gagne's Nine Conditions of Learning	Guidelines	Activities	Application suggestions
Gaining learners' attentiveness	Stimulate alertness of students' enrolling in the MOOC	Instructors recorded a short introduction video to welcome and brief students on the intended topic.	YouTube & Canva poster
Informing lesson objectives to learners	Provide objectives for the learners to understand the intended topic	Instructors provided the aims of each intended topic to encourage prepared understanding.	Canva postcards
Stimulating recollection of previous learning	Recall previous learning for better continuous learning	Instructors provided a review of previous lessons, starting from the first topic onwards.	Canva illustrations & mind-mapping

Table 1. (con't)

Gagne's Nine Conditions of Learning	Guidelines	Activities	Application suggestions
Presenting stimuli with idiosyncratic characteristics	Present content in an organised and understandable manner	Instructors prepared a step-by-step learning board to arrange each subtopic in a topic.	Canva mind-mapping
Providing guidance to learners	Provide an alternative approach to convey the content in compelling ways	Instructors summarised the topic with relevant keywords.	Canva mind-mapping
Prompting performance	Demand demonstration that shows learners' understanding	Instructors created activities to enhance students' understanding, for example, *crossword puzzle* activity based on the topic.	Classtools.net
Providing constructive responses	Give feedback to learners	Every topic has its own Question & Answer session with the instructor – this session has been pre-set in UiTM's MOOCs. https://ufuture.uitm.edu.my/login	Canva poster
Evaluating performance	Provide measurement tools to assess learners' performance	Every topic is followed by a set of tests to track students' understanding, and feedback is provided after each test.	Google forms
Improving preservation and transmission of knowledge	Retain and transfer knowledge in another medium	Instructors planned game activities and/or a case study for students to check their understanding of each topic. A section in UiTM's MOOCs will be developed to set the case study, where discussions will be encouraged.	Classtools.net

Practicality, usefulness, and novelty

MOOC tools encourage versatility (Lan & Hew, 2020). Similarly, MyOBM260 Notes Junkie offers learners who enrol in the course flexible ways to learn, without restrictions on the number of participants. Learners can also gain access to the content anytime and anywhere. Hence, the flexibility of MOOCs promotes student-centred learning and helps them improve their learning experience by offering varied challenges, activities, or additional materials for those who are interested to learn further about any topic. In the process, learners will experience a greater sense of autonomy. Nevertheless, learners are required to manage their learning schedule to get the best out of this mode of learning. Another element of learning via MOOCs is its asynchronous collaboration capability, particularly through the use of forums between learners and educators.

The potential benefits of online discussion forums to participants have been well examined and documented in previous studies. According to Afify (2019), the opportunity for learning and teaching anytime and anywhere is possible with asynchronous online discussion, for example, providing students with the time needed to process learning and to share ideas and points of view about learning materials. In MyOBM260 Notes Junkies, the features of asynchronous online discussion were embedded in the MOOC platform, allowing exchange of information via "Question & Answer Sessions," and discussions,

which can transpire at any chosen time. Another distinctive feature of the design and development of this MOOC protocol was the consideration given to learner differences. Individual differences are essential in the learning environment design (Schmidt, 2010). Therefore, designing appropriate learning methods is crucial in helping educators deliver knowledge and overcome the problems faced by their students in their learning (Jalil, Kassim, & Madar, 2019).

A well-designed MOOC should cater to several types of learners with different learning styles and learning needs. MyOBM260 Notes Junkies has been designed by incorporating several multimedia teaching methods, including the use of mind-mapping to present information. This MOOC had also employed Canva.com, an infographic tool, to create infographic materials to accentuate text and graphics. Additionally, teaching videos using multiple video makers, including Animaker, Powtoon, Biteable, Animoto, and YouTube video examples were also created to enhance learners' understanding and motivate their engagement. Given that the length of a video can affect its efficacy as a learning medium (Velegol, Zappe, & Mahoney, 2015), each teaching video developed for MyOBM260 Notes Junkie were set to be less than five minutes to promote active and effective learning. Guided by Gagne's Nine Conditions of Learning Theory, the design of MyOBM260 Notes Junkie is in line and compatible with the desired learning environment of MOOCs, that is, to promote self-directed learning and critical thinking through a flexible and motivating learning platform.

FINDINGS

Engaging students in MyOBM260 Notes Junkie via the MOOC platform encourages self-directed learning. It also promotes the development of an autonomous behaviour among learners, which includes organising resources based on their own initiatives, a practice which is rare in the traditional face-to-face classroom (Snodin, 2013). For instance, the use of Canva, as mentioned in the previous section, enables the presentation of course notes in an organised, creative and attractive manner, which makes it easier for students to retrieve information and to do revision. The brevity and clarity of the notes enhances learning and understanding, and students are able to quicky grasp the gist of a topic. Well-prepared, they are at an optimal condition to retain more information while going through the lesson.

As MOOC learning has been closely linked to the learner's ability in selecting and regulating their pace of learning, this enables and motivates them to learn better. By using MyOBM260 Notes Junkie, the learning process is within the students' control, and they can press the next button when they are ready to proceed to the next level of learning. MyOBM260 Notes Junkie also enables students to understand notes better through mind-mapping, while improving their note-taking skills. Visual elements, such as images, curved branches with colours like tree branches or a fishbone structure, help students recall and retain information quicker and better (Santiago, 2011). By noting only keywords, students can save time studying, since only the most important information needs to be recalled. Additionally, MyOBM260 Notes Junkie via the MOOC platform also helps facilitate collaborative learning. Online learners benefit greatly because of their connectivity with one another, which helps them share, add knowledge and fulfil their mutual goals (Yuan & Kim, 2014). Eventually, MyOBM260 Notes Junkie MOOC can foster a positive relationship among teammates which is essential in promoting enhanced cohesiveness (Lambert, 2020).

CONCLUSION

MyOBM260 Notes Junkie comprises multiple learning tools that have been carefully selected and incorporated, before being embedded in the MOOC. The notes in the MOOC can be flexibly used by students for repetitive learning, revision, and additional learning beyond the classroom setting. By replicating a simplified version of the subject into MOOC, guided by Gagne's Nine Conditions Learning Theory, this MOOC protocol was mooted with the aim to assist OMT students in enhancing their learning experience, and remains an ongoing project that seeks and explores new and innovative ideas to meet the changing needs of students and the landscape of teaching and learning.

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Analysing political candidates' popularity on social media using POPularity MONitoring (POPMON)

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ABSTRACT

Recent advancements in information technology and computing devices has significantly transformed the method of sharing ideas, opinions, experiences and feedback on products, services, political issues via social media sites. Nowadays, in the digital era, social media platforms such as Facebook, Instagram, Twitter and blogs have generated a massive amount of text data in the form of messages, chats and posts. This phenomenon has led researchers to analyse the content of short messages (tweets) that contain political insights on Twitter. This study proposes a web-based application tool of real-time Twitter sentiment analysis (POPMON) which can be used to analyse public opinion and track the popularity of famous political candidates. In this study, politicians' Twitter accounts were selected, incorporating millions of Twitter users and real-time tweets (raw data) and gathered using a tweet crawler. Various text mining techniques were applied to the raw data for a pre-processing purpose. For instance, the Naïve Bayes algorithm was applied to the cleaned data to be classified into sentiment polarities such as positive, negative, or neutral. The findings enable a more thorough understanding of the political sentiment and the possible points of view regarding political candidates' popularity. Finally, the political sentiments were visualised in graphical plot graph, doughnut chart and word cloud for a better analysis. These findings will aid politicians in improving their public service, assist political parties and their leaders on planning publicity campaigns and predict the outcomes of future elections to a certain extent.

Keywords: ***Sentiment analysis, Twitter, Naïve Bayes, social media***

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INTRODUCTION

The advancements in mobile communication technologies and computing devices have led to the rapid growth of data sources such as social networking applications, images, online news, email messages, videos and medical records (Zainol, Jaymes, & Nohuddin, 2018). Nowadays, the applications of digital social media platforms such as Facebook, Instagram, Twitter, LinkedIn and blogs have offered users immense opportunities to share information, ideas and life stories (Hua, So'od & Hamid, 2019). These social media platforms have generated large amounts of text data in the form of messages, chats and posts. Lin (2021) reported that there are 192 million daily active Twitter users with 500 million tweets sent out daily. Twitter allows users to post short messages (tweets) that contain text (news, questions, brand announcements), GIFs and memes, promo codes, flash sales, link to external websites, etc. (West, 2020). Social networking, or the practice of sending brief messages to an audience on a social network, allows users to reach out without forcing unwanted contact with someone who may feel compelled to react (Jindal & Aron, 2021). According to Khairulnissa, Krisnan, Kaundan and Aziz (2021), social networking has tremendously altered how information (news) is consumed and disseminated. Responses to online social media responses are more voluntary. Sentiment analysis is a technique that enables natural language processing and data mining to define and extract human emotions from unstructured text. Data mining is used for learning and training data sets gathered from social media. It is the most utilised sentiment analysis technique.

Recently, the applications of social media such as Twitter, Facebook, Instagram, and YouTube in politics have dramatically changed the way political campaigns are run and how voters interact with their political candidates (Hua et al., 2019). A growing number of users and governments have engaged in political activities such as general elections, digital campaigns during elections, political parties, etc on the social media. This phenomenon has led to the growth of data. This large amount of data (text data) is believed to contain interesting patterns and valuable insights within it. As such, determining people's attitude and sentiment concerning a specific topic or person especially political topics and public figures has been a growing interest. For example, Tumasjan, Sprenger, Sandner, and Welpe, (2010) examined the 2009 German Federal Election using Twitter that could be used to predict the outcome of the election. There were more than 1,000 tweets collected from August 13 to September 19, 2009 that contained the names of the six public figures represented in the German Parliament. The collected data was then used to extract the sentiment results. Based on the results, they concluded that the probability of winning the elections was directly proportional to the number of tweets mentioning a particular public figure.

However, analysing social media data is still considered a difficult and daunting task as the dynamic and complexity of the data often hinders researchers to effectively transform the data into valuable knowledge (Zeng, Chen, Lusch, & Li, 2010). To overcome this limitation, social media analytics synthesises the data, triages the responses and evaluates the data in real-time. The focus of this research is to develop scientific methods and software tools for tracking, mining, and analysing the vast amount of social media data available on the internet. This method not only helps in speeding up the analysis on the vast and unstructured data but facilitates researchers to discover hidden insights of social media data and provide insightful suggestions to practitioners in their decision making and operations.

Therefore, the aim of this study is to develop a web-based application tool of real-time Twitter sentiment analysis using POPularity MONitoring (POPMON) to analyse public opinion and track the popularity of famous political candidates. The opinion data sets collected from Twitter are classified into three main categories: positive, negative, or

neutral. The classified results of each candidate can then be used to predict the outcome of the election as well as to help political parties and their leaders in planning publicity campaigns and future strategies.

BACKGROUND AND RELATED WORK

Data Mining (DM), also known as data exploration, is one of the steps in Knowledge-Discovery in Databases (KDD). DM generally refers to the process of searching for useful patterns in an enormous quantity of data through algorithms (Dunham, 2006). DM is based on database theory, machine learning, artificial intelligence, and the rapid development of modern statistics. It has been applied in many fields such as education (Abdo et al., 2021; Rahayu, Kamarudin, & Zainol, 2018; Rastrollo-Guerrero, Gomez-Pulido, & Duran-Dominguez, 2020), healthcare (Rasid et al., 2018; Zainol, Nohuddin, Rasid, Alias, & Nordin, 2019), sentiment analysis (John & Jonar, 2020; Julieta, John, & Anicia, 2020), business and financial analysis (Bauder, da Rosa, & Khoshgoftaar, 2018; Chan, Lee, & Zainol, 2020; Monamo, Marivate, & Twala, 2016, Majumder & Nath, 2021; Abd Rahman, Jamaludin, Zainol, & Sembok, 2021), climate prediction (Horrocks et al., 2020; Rashid, Nohuddin, & Zainol, 2017), crime investigation (Delima, 2019; Feng et al., 2019), document content analysis (Canito, Marreiros, & Corchado, 2019; Nohuddin, Noormanshah, & Zainol, 2021; Noormanshah, Nohuddin, & Zainol, 2018), etc. DM consists of various tasks (e.g., classification, clustering, association rules, etc.) and techniques. The summarisation of DM tasks and techniques is given by Nohuddin et al. (2018). Furthermore, these tasks and techniques can be applied individually or can be combined to implement sophisticated processes.

In DM, classification is a typical approach for classifying data points. It may be used to arrange various types of data sets, including complicated and big data sets as well as small and basic data sets (Colonna, 2013). This study categorised text or words to determine the expression of social media users; thus, one of the main reasons why classification as supervised learning is often used in DM for categorisation. The main objective of classification is to link a variable of interest to the needed variables, in this context, words and terms. The variable in question could be qualitative variables. Thus, classification algorithms come in a variety of shapes and sizes, each with its own set of features and applications (Sarker, 2021).

Naïve Bayes is a popular probabilistic data mining algorithm. It can be applied in a variety of classification applications such as filtering spam messages, classification of documents and sentiment prediction (Kim, Hahn, & Zhang, 2000). The Naïve Bayes algorithm is one of the classification techniques based on Bayes' Theorem. It assumes that the presence of a specific characteristic in a class is unrelated to the presence of other characteristics. For instance, a stationary may be assumed as a ruler if it is rectangular and long. Even though these characteristics depend on each other to assume true, but they are still independently contributing to the probability that this stationery is a ruler, and this reason is named "Naïve". A comparison of techniques was conducted by Kharde & Sonawane (2016) who claimed that machine learning methods such as Naïve Bayes demonstrate the highest accuracy compared to lexicon-based approaches.

Next, sentiment analysis (SA) is a subset of data mining where the sentiment of the public is measured through natural language processing. As stated by Liu and Zhang (2012), SA is also known as opinion mining that is applied to study human sentiments toward specific entities, individuals, issues, events, topics and their attributes. Concisely, SA is an automated process that allows machines to identify and extract opinions within the text, such as tweets, emails, product reviews and survey responses. In recent years, SA has become a hot topic in

different fields such as politics, business, and products. According to Fang and Zhan (2015), the internet is a platform full of resources with regard to sentiment information. It is because people nowadays are more likely to post and share their opinions on social media such as review sites, forums, and blogs. Therefore, with the help of SA systems, these unstructured data on the internet could be automatically transformed into structured data of public opinions about products, services, brands, and politics. This data can be very useful for commercial applications like marketing analysis, public relations, product reviews, product feedback, and customer service. In short, SA helps in detecting the emotions behind the words.

The importance of social media analytics

Social media analytics was introduced in the last few years for mining, analysing, and modelling data from social media, which is also the motivation for this research. It can help researchers from various perspectives such as business, politics and entertainment to gain insights and facilitate practitioners in decision-making, business strategies, and solution frameworks using social media content. Further, the explosion of social media usage has encouraged organisations, businesses and governments to shift their attention to this new technology, which drives the pressure to engage with people and understand them better. Government institutions, especially have shown interest in monitoring public opinion using data from the web and social media. As an example, Song, Kim, and Jeong (2014) analysed behaviour and how social issues emerge and change on Twitter. The researchers found that controversial issues on Twitter are generated and propagated in a more innovative way compared to existing media. Further, users with the same political dispositions tend to communicate and share information with their social companions on Twitter.

In another strand of social media research, Segesten and Bossetta (2016) studied how and to what extent the public use Twitter for political mobilisation in the electoral context. The social media analytics demonstrated that the public or citizens play an important role as a primary initiator and sharer of political acts on Twitter through the hashtag feature. Next, Jungherr, Schoen, and Jürgens (2016) analysed Twitter messages during the German Federal Election to compare politically relevant tweets with content in surveys and television news. The study revealed that some aspects of political events in traditional media influenced and mirrored in Twitter messages reflect a true image of the political situation. Since Twitter serves multiple purposes and functions with a wide diversity of content, more people are seen to favour this online platform compared to traditional media to obtain real-time information (Bian et al., 2016). Table 1 depicts a number of reviewed studies related to social media research in the political domain. It shows that various studies and analysis have been implemented to examine the dynamic and hidden narrative that is hard to capture on every tweet. By analysing social media data, this study offers insights from the unstructured and informal data of political tweets that will provide valuable knowledge and useful information.

Table 1. Overview of literature in social media research in the political domain

Source	Focus/Area	Research on	Analysis	Main findings
Abascal-Mena, Lema, & Sedes (2015)	Politics	Detecting socio-semantic communities	Social network analysis	Interactions between societies
Park, Park, Lim, & Park (2016)	Politics	Structure and content composed on Twitter during the presidential election	Social network analysis	Mass media political purposes correlates with political participation on social media

Table 1. (con't)

Source	Focus/Area	Research on	Analysis	Main findings
Varol, Ferrara, Menczer, & Flammini (2017)	Politics	Early detection of promoted campaign	Classification	Dynamic campaign pattern
Yıldırım, Üsküdarlı, & Ozgur (2016)	Politics	Topic extraction on Wikipedia	Topic modelling	Proposed a model to identify topics in a microblog post
van Vliet, Törnberg, & Uitermark (2020)	Politics	Twitter politics differences	Exploratory analysis	Cross-national differences in how parliamentarians engage in politics on the social media platform

Sentiment analysis using social media data

Many studies have been conducted to analyse tweets in monitoring real-time political sentiment. For instance, Soelistio and Surendra (2015) applied SA to surge data from digital news articles concerning positive or negative sentiments about a specific politician. Using the Naïve Bayes classifier approach, they proposed a simple model for analysing digital newspaper sentiment polarity. It showed promising results and overall, this study focused on the likelihood of whether journalism provides a positive or negative review on target political figures.

Furthermore, Elghazaly, Mahmoud, and Hefny (2016) conducted a SA in the context of politics by using Twitter data. The political tweets were collected and published on Twitter's public message board from March 1 till June 24, 2012, before the Egyptian election, with the volume increasing as the election drew nearer. The goal of this study was to present and compare results obtained from the presidential elections in Egypt 2012 with Arabic text collections using the Support Vector Machine (SVM) and Naïve Bayes techniques. The data was mined using WEKA and the two techniques were used to compare the Arabic text classification. This study also aimed to measure the accuracy and time to get the results for each classifier and to determine which classifier is more accurate for Arabic text classification. The authors concluded that the Naïve Bayes technique had the highest accuracy with the lowest error rate.

In another study, Goel, Gautam, and Kumar (2016) developed a real-time movie rating SA system based on customer opinions from Twitter. The techniques used in this system were Naïve Bayes along with SentiWordNet, an English-based lexicon database that provides the definition and scores of positivity, negativity and objectivity for each word. The data was collected from Twitter in real-time using Twitter's dedicated application programming interface (API). The results showed an accuracy of 58.40%. The authors also explained that the accuracy of the Naïve Bayes classifier could be improved by using it together with SentiWordNet. Similarly, Awwalu, Bakar, and Yaakub (2019) proposed a hybrid N-gram model approach with a Naïve Bayes classifier to perform SA. It was dedicated to analysing political tweets from Twitter. The hybrid N-gram model used was the combination of unigram and N-gram models. The authors mentioned that social media such as Twitter has some relationship with real life when it comes to politics. According to Matta, Kishore Sabbavarapu, Priya, and Challa (2019), there were three main political parties selected to be analysed during the 2019 General Elections. The data from Twitter, Facebook and YouTube were manually collected from the official pages of these political parties. The Naïve Bayes and Dictionary-based approaches were applied to analyse the sentiment from the collected data. They also concluded that the Naïve Bayes algorithm and Dictionary Based classification algorithm work efficiently to classify textual data.

In another setting, Wongkar and Angdresey (2019) developed an SA Twitter application for the 2019 Republic of Indonesia presidential candidates. The SA was carried out in many phases, including data collection using Python libraries, text processing, testing training data, and text categorisation using the Naïve Bayes technique to classify social groups' level of emotion. Their findings showed the positive sentiment polarity of the Jokowi-Ma'ruf Amin pair was 45.45% and the negative sentiment polarity was 54.55%, while the Prabowo-Sandiaga pair received a positive sentiment score of 44.32% and a negative sentiment score of 55.68%. The combined data was then evaluated against the training data used for each presidential contender, yielding an accuracy of 80.9%. The authors also compared three techniques which were Naïve Bayes, SVM, and K-Nearest Neighbor (K-NN) and found that Naïve Bayes had the highest accuracy value of 75.58%.

Gobithaasan and Hamid (2020) presented their research findings of SA to determine the public approval of Pakatan Harapan, the new Malaysian administration led by Tun Dr. Mahathir Mohamad and Dr. Wan Azizah, with Dato Seri Anwar Ibrahim's influence. The experiment used the Naïve Bayes technique to categorise tweets into three categories of sentiments: positive, neutral, and negative. Their first stage included extracting tweets for a month (March to April 2019) using the following search terms: Pakatan Harapan, Mahathir Mohamad, Anwar Ibrahim, and Wan Azizah. The final analysis revealed that neutral emotion (41%) predominated in tweets about the new government, followed by positive sentiment (30%) and negative sentiment (10%) whereas (29%) Malaysians liked the new administration.

Based on the above assessment of the literature, it can be concluded that the Naïve Bayes classification approach is a commonly employed algorithm for predicting sentiment on Twitter data.

METHODOLOGY

In this study, the CRoss Industry Standard Process for Data Mining (CRISP-DM) methodology was applied to explain the development of POPMON. According to Shafique, Qaiser, and Research (2014), CRISP-DM is acknowledged as one of the most widely used models by DM researchers and experts as it offers a complete framework and guidelines for data miners to resolve existing problems. The CRISP-DM model consists of six main phases: project understanding, data collection, data preparation, modelling, evaluation, and deployment. Each phase plays an important role in developing an application. The advantage of this model is that it is not necessary to follow the order of the phases to develop the application. This model is flexible, where we can always go back to the previous stage to adjust the details. Figure 1 shows the overall phase of the CRISP-DM methodology and its workflow.

Phase 1: Project understanding

Similar to other methodologies, the first step is to understand the project objectives and requirements. This project focuses on analysing public's attitudes and opinions towards politicians on Twitter. The intention is to assist political parties and politicians to plan future strategies, design promotions, and take care of their public image. In addition, the main objectives were set up to perform sentiment analysis on the collected tweets and to develop an application that can be applied for monitoring the popularity of political candidates. This application is capable of classifying each tweet as positive, negative or neutral.

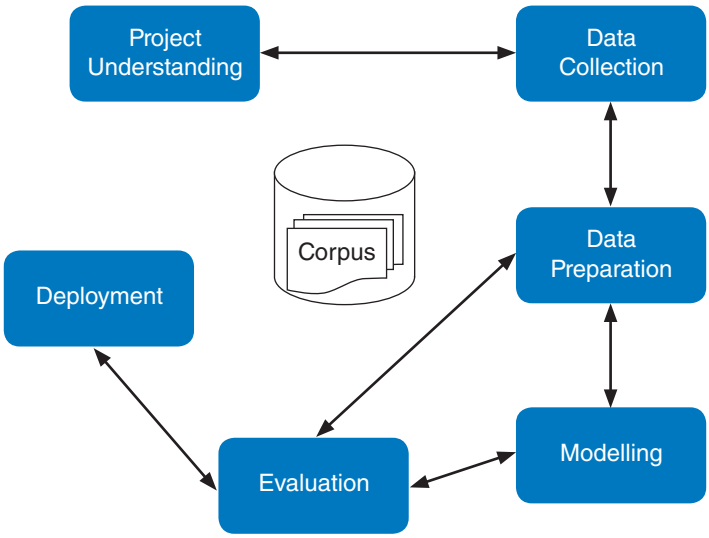

Figure 1. The CRISP-DM model adapted from Wirth & Hipp (2000)

Phase 2: Data collection

The study crawled data sets (tweets) from Twitter using the python package named *GetOldTweets3* (Mottl, 2018). In this application, targeted politician details such as Twitter account name, Twitter ID description, and image were required to be added into the application. The application crawled for the related tweets starting from December 2019. All related tweets were automatically collected in real-time. Only tweets in English were retrieved and used. All tweets were stored in CSV files where various files for each politician were listed. The raw CSV files consist of the following information: date and tweet message. In this study, we applied the Twitter account of a popular US politician – Donald Trump (@realDonaldTrump). The sample of Donald Trump tweets as demonstrated in the posts is shown in Table 2.

Table 2. Sample of tweets

Post No	Tweet Message
#1478	Donald Trump is not running a campaign against political correctness. He's just running a campaign that is against being correct.
#3146	Donald Trump is an expert at distracting people from the fact that he has nothing substantive to say for himself. https://t.co/1ZHvalDS3R
#4673	"If trump suggests I won't call this threat what it is, he hasn't been listening. "@lisa_m. https://t.co/1ZHvalDS3R
#5891	"@sara_wejesa: @realDonaldTrump Great speech!!!!!!!" Thanks!

Phase 3: Data preparation

This stage focused on pre-processing the collected tweet data. Pre-processing data could be a difficult task since there are many essential steps involved. The results obtained at this stage will affect the results of all the subsequent stages. During the process of collecting raw data, noisy data is inevitable. The raw tweets often contain spelling errors, hyperlinks, hashtags, usernames, and repeated characters. Therefore, a thorough data cleansing process was applied to the collected data. Firstly, the words in each tweet were tokenised. In other words, the text (tweet) was split into small units (tokens). In this experiment, we applied Natural Language Toolkit (NLTK) – a Python package that contains libraries for statistical

Natural Language Processing. Next, the spelling of the tokenised words was corrected. The hyperlinks (URLs), mentions, emojis, smileys, numbers, and hashtag symbols as well as English stop-words were removed from the tweets. Stop-words are common words that do not provide any additional insight (Kwartler, 2017) such as "it", "they", "with", "we", "I", "been", "what", "this", "is", "a", etc. A stemming process was also applied to the words. Stemming is a process of reducing common words to their roots such as 'listen' (listening/listened/listens). Lastly, the words were grouped into bigrams in order to achieve the best possible results. The example steps of pre-processing for post number #4677 *""If trump suggests I won't call this threat what it is, he hasn't been listening. "@lisa_m. https://t.co/1ZHvalDS3R"* is shown in Table 3. The cleaned data sets were then used as an input file (training data) in Phase 4 modelling.

Table 3. Example of tweets after cleaning process for post #4673

NLP Library	Result after text pre-processing
Word tokenisation	["If", "trump", "suggests", "I", "won't", "call", "this", "threat", "what", "it", "is", "he", "hasn't", "been", "listening", "@lisa_m" "https://t.co/1ZHvalDS3R"]
Removing URL, mentions, emojis, smileys, number, punctuation, hashtag, etc.	["If", "trump", "suggests", "I", "won't", "call", "this", "threat", "what", "it", "is", "he", "hasn't", "been", "listening"]
Removing stops words	["trump", "suggests", "call", "threat", "listening"]
Applying stemming	["trump", "suggest", "call", "threat", "listen"]
Setting bigrams	[("trump", "suggest"), ("suggest", "call"), ("call", "threat"), ("threat", listen")]

In addition, a set of training labels data was also prepared to extract features to train the model in the next phase. The training data was obtained from the Twitter Sentiment Corpus by Niek Sanders from Sentiment140 website (Sanders, 2011). It consists of 5,513 tweets in sentiments which are all labelled manually as "positive", "negative", "neutral" or "irrelevant" (Figure 2). There are almost 1,000 tweets labelled as "positive" or "negative" which are useful for this study.

	topic	sentiment	tweetID
2	apple	positive	126415614616154000.00
3	apple	positive	126404574230740000.00
4	apple	positive	126402758403305000.00
5	apple	positive	126397179614068000.00
6	apple	positive	126395626979196000.00
7	apple	positive	126394830791254000.00
8	apple	positive	126379685453119000.00
9	apple	positive	126377656416612000.00
10	apple	positive	126373779483004000.00

Figure 2. Sample of nine records of training labels data

Phase 4: Modelling

Figure 3 illustrates the process of how a supervised machine learning model classified the text data into various sentiment polarities – positive, negative and neutral. In this study, the Naïve Bayes algorithm was applied for building the model. As mentioned earlier in Phase 3, a cleaned data set was used as training data which is split from a set of complete data

that had been labelled. This labelled data is ready to be used to train and build a machine learning model. In this stage, the training data was used to train the model. The trained model then becomes the classifier that was used to predict the sentiment polarities on the collected data. Finally, the visualisation and analysis results will be explained in the results and discussion section.

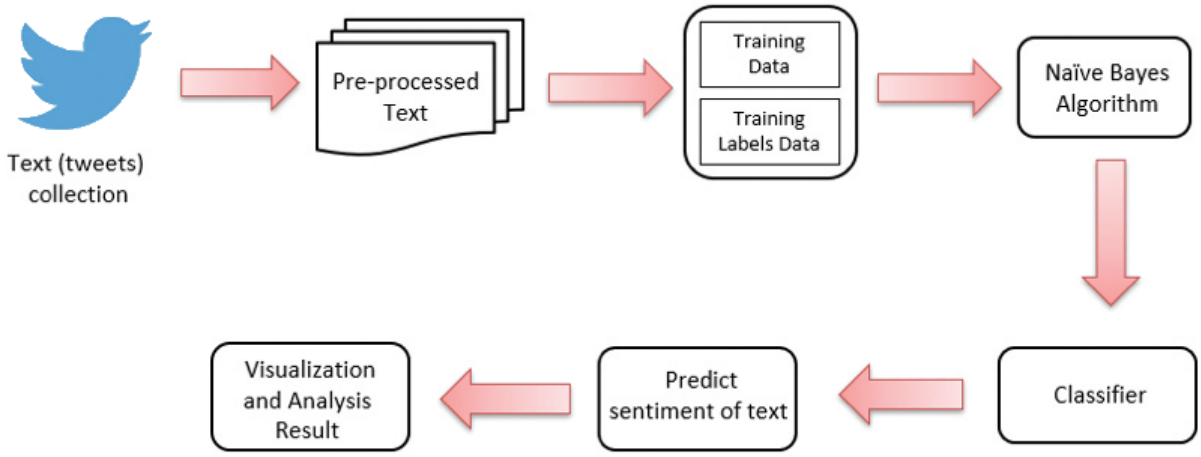

Figure 3. An illustration of how the machine learning model classifies text data

```
Input: Training dataset S,

      TP= (tp1, tp2, tp3,.., tpn) // value of the predictor variable in
            testing dataset.

Output: A class of testing dataset.

Step:

      1. Read the training dataset S;

      2. Calculate the probability stats for the terms in each class;

            //build the dictionary

            3. Repeat Calculate the probability of tpi using gaussian
            normalization equation in each class;

            Until the probability of all tp1, tp2, tp3,.., tpn) has been
            calculated.

      4. Calculate the likelihood for each class;

      5. Get the greatest likelihood
```

Figure 4. Naïve Bayes based model pseudocode

In this study, the developed Naïve Bayes based model is presented as a pseudocode in Figure 4. A set of data (S) was used to train the model to generate classifiers based on these word counts to find the probability of the word (TP) for all defined classes. Thus, as the model gathers the probability statistics for the words or terms, the model creates a dictionary of classifiers and counts how many times each word appears in positive, neutral or negative tweets. The process was iterated to smoothen the ratio of the likelihood for each class. Once the model was refined, it was used to test the rest of the data sets.

Phase 5: Evaluation

It is essential to evaluate the model that had been built as well as the data that had been prepared. In this stage, we can always go back to the data preparation and modelling stage to assess if there are any improvements or any details that need to be added to both stages. The purpose of this stage is to ensure that the data and model built are well prepared to produce good results. Test data sets were used to test the built model to find out the accuracy. If the accuracy is not ideal, it is advisable to go back and adjust the details in the previous stages such as data preparation and modelling. For instance, the necessary pre-processing steps can be added, and existing steps can be adjusted in the data preparation stage if any of the data cleaning steps were found not desirable during this stage. However, because the Naïve Bayes approach relies heavily on labelled data, a new training set may be used to retrain the classifier if the labelled data is inadequate.

Phase 6: Deployment

Depending on the project requirements, the deployment stage can be as simple as producing a report for the analysed data. At the final stage, the built model of the Naïve Bayes classifier was used to deploy the application. A user interface was also built during this stage for a user to interact with the model and its results. The application was designed to have a tweet crawler for collecting real-time data, while the data is passed to the Naive Bayes classifier to be analysed. Each collected tweet were classified into positive, negative, and neutral.

RESULTS AND DISCUSSION

Figure 5 shows the main interface of the Login page for the POPularity MONitoring (POPMON) application. The aim of this page is to ensure that only a registered user is allowed to access the application. There are two main fields available for a user to input a username and password. The application will check the users' credentials based on their login and password. All passwords that are stored in the database will be encrypted for data privacy. After logging in to the application, the user will be redirected to the dashboard.

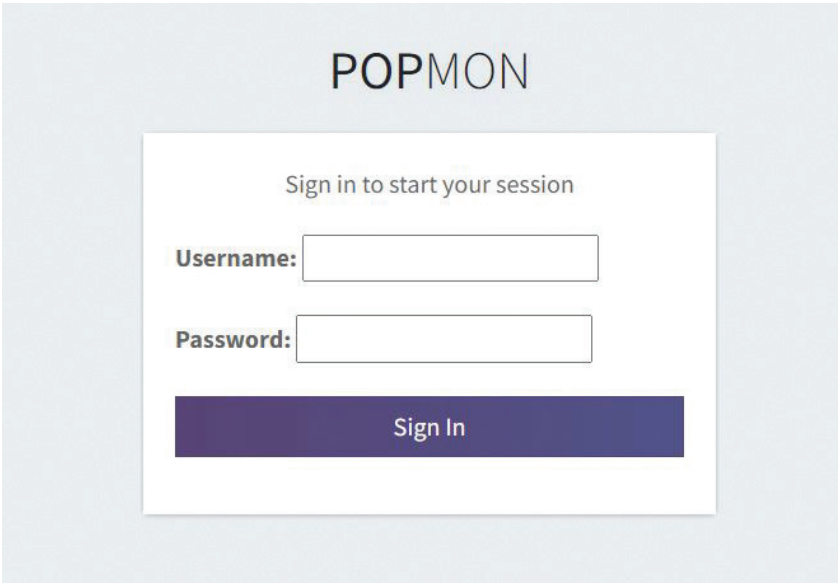

Figure 5. Screenshot application interface – login page

Figure 6 shows a dashboard page of the application which is accessible by a registered user. This page consists of three main panels: menu, widgets and graph. A navigation menu is located on the left-hand side of the page with a list of navigation items for the user to navigate to other pages such as homepage (dashboard), all politicians, dashboard tweets and analyse tweets. The second panel is widgets (on the top of dashboard) which presents a list of politicians, total tweets (today), total positive tweets and total negative tweets. Finally, the last panel presents a bar graph that provides interesting insights into the politician's sentiment. It also visualises the overall result of the politicians' tweets in the form of vertical bar graph. As shown in the graph, the vertical axis represents the number of tweets, and the horizontal axis represents the selected politicians in the application. The green bar shows the total number of positive tweets, the blue bar represents the total number of neutral tweets, and the red bar represents the total number of negative tweets for a particular politician. Among nine listed politicians, Donald Trump showed the highest total amounts of both negative and positive tweets (Figure 6). For instance, 320 tweets were negative, while 80 tweets were positive. In this study, almost 70% of the collected tweets were extracted from Donald Trump's Twitter account which led to an imbalanced result analysis.

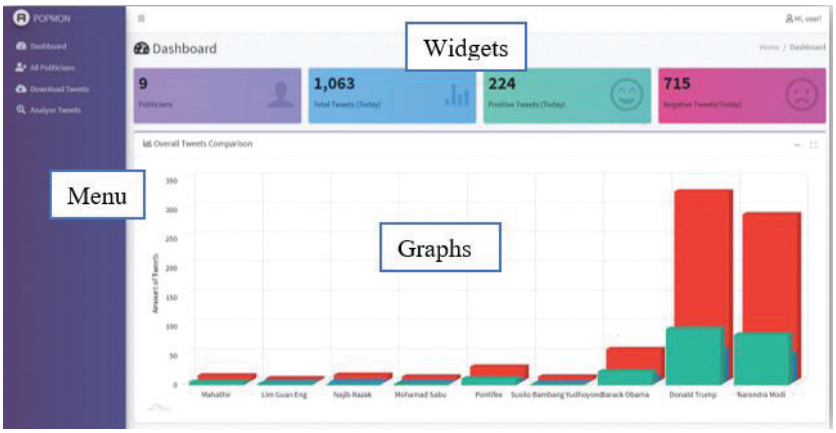

Figure 6. Screenshot application interface – user's dashboard

On the left-hand side of the widget, there is a small widget button for a user to view the full list of politicians and insert a new politician candidate (Figure 7). After clicking this button, a form will be displayed in a pop-up modal as shown in Figure 8. Users need to fill in the important information of the politician such as the politician's Twitter account, description, Twitter ID, and a picture of him. By clicking the button 'add', the application will then crawl the selected individual politician's Twitter account and display the politician's real-time sentiment results in the form of a doughnut chart and word cloud (Figures 9 and 10).

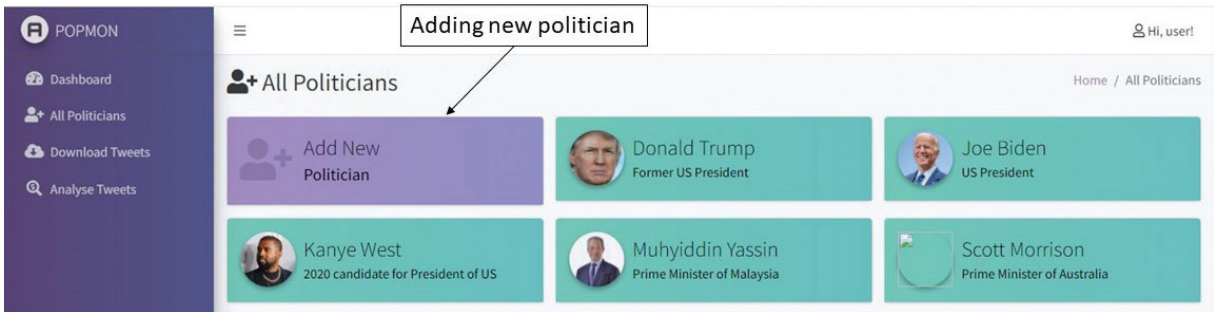

Figure 7. Screenshot application interface – adding new politician

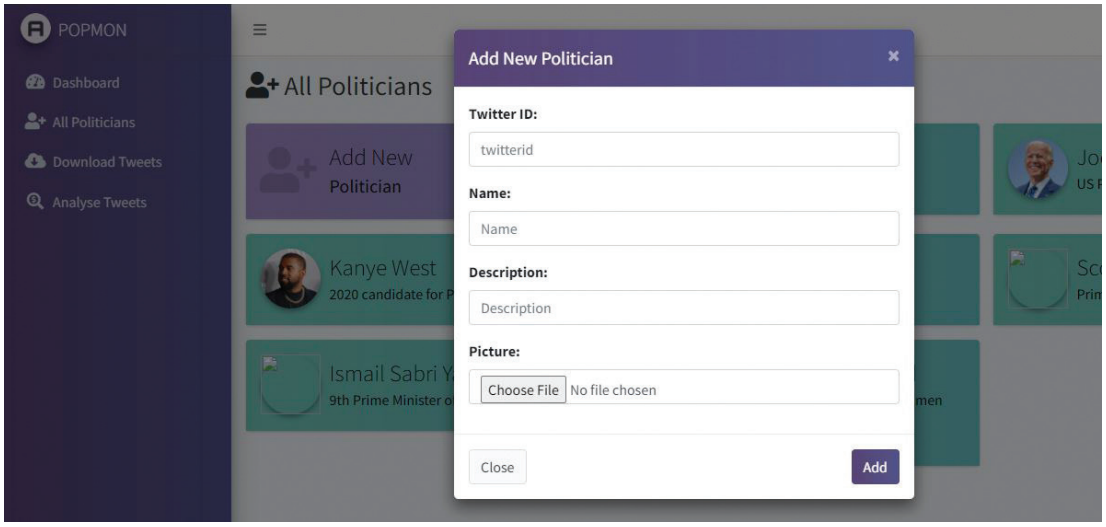

Figure 8. Screenshot application interface – inserting information of a new politician

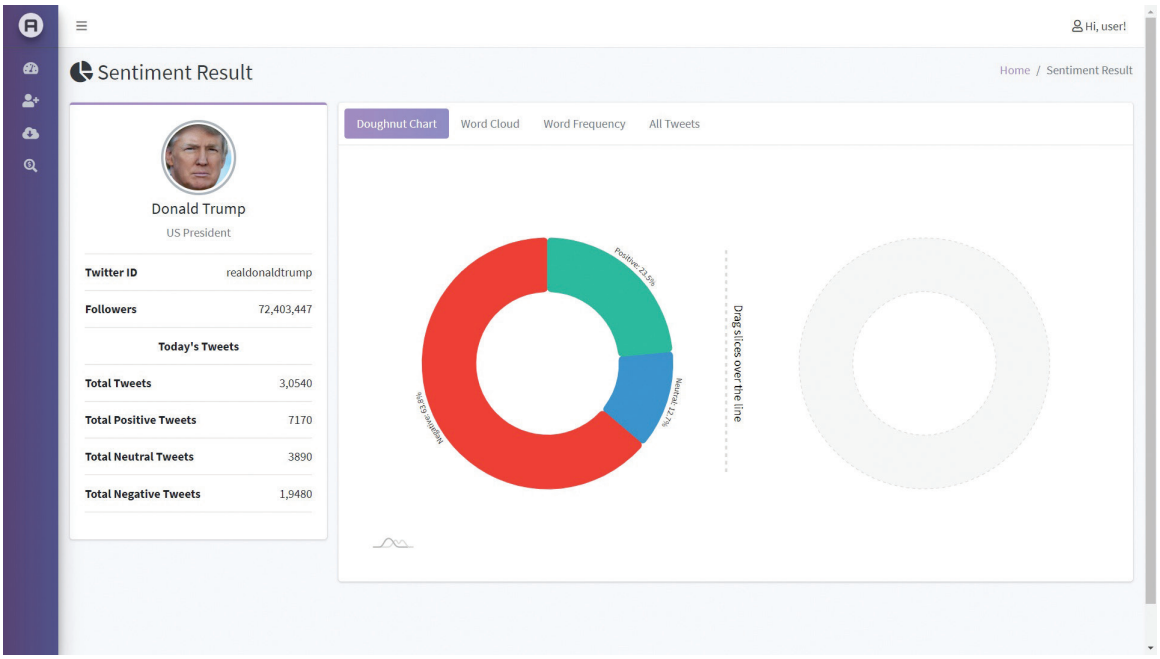

Figure 9. Screenshot application interface – sentiment result

Figure 9 shows the doughnut chart that displays the total tweets for Donald Trump. It contains three colourful slices of total tweets: positive (green), negative (red) and neutral (blue). This result analysis shows that Trump's tweets were often negative (19,480) than positive (7,170). Figure 10 shows the sentiment of 30,540 tweets in the form of a word cloud. Word cloud gives a quick visualisation of the most frequent words in different sizes and colours. Notice that words like "trump", "president", "like", "people", "think", "world", "dont", "get", "never", "you're" are among the top 10 most important words found in 30,540 tweets. Among the top frequent words, there are some words that are insignificant such as "get", "world", "dont", "youre", etc. The words in bigger size such as "trump", "president", "people" can be interpreted as neutral tweets whereas "lies", "fake", etc. are considered as negative tweets.

Figure 10. Screenshot application interface – Trump tweets' word cloud

As a result, the developed POPMON application allows us to identify trends of political sentiment and the possible points of view regarding the popularity of political candidates. The ruling government or any political party can use this application to analyse the public's text-based opinions quickly and methodically.

CONCLUSION AND FUTURE WORK

Public opinion is important to all politicians for improving their service to the public. In this study, we developed a web-based application tool of real-time SA on Twitter (POPMON) which can be used to analyse public opinion and monitor the popularity of political candidates. For this purpose, an experiment was set up to apply the text mining techniques on the real-time tweets (raw data). It was a very challenging task to conduct the data pre-processing as the tweets often contained spelling errors, hyperlinks, hashtags, usernames, and repeated characters. The Naïve Bayes algorithm was applied to the cleaned data which was then classified into sentiment polarities: positive, neutral, or negative. Based on the results, Donald Trump has shown the highest amount of both negative and positive tweets where 320 tweets were negative, and 80 tweets positive.

The top frequent words such as "trump", "president", "like", "people", "think", "world", "dont", "get", "never", "youre" describe the public opinion on Trump. In conclusion, the POPMON application can be utilised by the government or any political party to analyse the public's text-based opinions easily and systematically. It derives significant insights that are critical to better understand public perceptions, their expectations and enables these parties to improve their strategies and political decision-making process such as devising manifestos and policies, selecting suitable candidates for a position in the party or launching a political campaign based on public sentiments. Theoretically, it also allows researchers and practitioners to examine the underlying meaning of texts and reveal the emotions using linguistic and psychological textual analysis. For future work, this study can be extended by adopting other classification techniques such as Support Vector Machine, decision tree and including the performance comparison of each method.

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Influence of digital literacy on student performance: A conceptual framework

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ABSTRACT

21st century learning requires students to develop the necessary skills, knowledge, and attitude to meet the demands of jobs in the digital era. Therefore, most school curriculums have been embedded with technology to facilitate these competencies. However, past studies have found that despite the many benefits of using technology in the educational setting, many students still lack digital literacy skills. Digital literacy is a must in the current educational setting as it enables students to organise, manage, and evaluate information using digital technologies in a responsible manner. Digital literacy also boosts student performance and motivation. This paper proposes a conceptual framework of digital literacy that can influence student performance. Preliminary research was conducted with two secondary school teachers from Klang Valley. The data obtained was supported by literature review, and used to develop a proposed framework which has three dimensions: individual factors, learning environment factors, and sociocultural factors as these factors were found to influence digital literacy and student performance. It is hoped that this framework can be used to investigate the factors of digital literacy amongst students and their influence on students' learning performance. This endeavour will also support the initiative taken by the Ministry of Education (MOE) Malaysia to prepare students for 21st century learning, in addition to aligning the education system with Malaysia's Education Blueprint 2013–2025.

Keywords: ***Digital literacy, student performance, individual factors, learning factors, sociocultural factors***

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INTRODUCTION

21st century learning emphasises on three main aspects which include learning skills, information and media, and life skills. According to Voogt, Fisser, Good, Mishra, and Yadav (2015), the combination of specific abilities, knowledge, talents, and digital literacy with computational thinking will benefit students through the provision of multidimensional skills that can improve their performance. Additionally, learning using technology applications and collaborating with other students in teams can improve leadership skills (Savic & Kashef, 2013). Therefore, digital literacy, the internet, and Information Communication & Technology (ICT) applications can be considered as critical needs for 21st century learning. Many modern primary and secondary school curricula have included Informatics Education Fundamentals, thus allowing students to master IT applications and work seamlessly on digital platforms. Complementary reports have given an overview of informatics education in various countries such as Poland, Japan, Russia, Italy, Germany, United Kingdom (UK) and the United States (US) (Heintz, Mannila, & Farnqvist, 2016). The science behind IT is given various names such as "Computer Science" (the most common term in the US), as well as "Computing Science" and "Informatics" (the most common in continental Europe). Hence, 21st century learners need to obtain new dexterities, information, and lesson approaches that are affiliated with future job demands in the digital economy within the complex information environment (Kuhlthau, 2010). This provides a rationale for educators to provide guidance and instruction on a variety of information-seeking tactics (Mohamed Shuhidan, Wan Yahaya, Hashim, Mohamed Shuhidan, & Abd Hakim, 2019) so that students can obtain the knowledge they need while avoiding unsuitable material. This also implies that students should be exposed to digital literacy to prepare them for lifetime learning and future job skills that drive the digital economy (OECD, 2016).

LITERATURE REVIEW

According to Allen & Berggren (2016), digital literacy can be regarded as the ability of individuals to use digital tools, facilities, and resources to construct new knowledge in specific life situations. In addition, Harshbarger (2016) believed that digital literacy revolves around the usage of digital tools and facility within the context of state-mandated curricular content by focusing on the development of the communication, collaboration, critical thinking, and creativity (4C) skills of students. This curricular setting also helps students with the development of non-cognitive factors (academic behaviours, academic mindset, learning strategies, social skills, and perseverance) as stepping stones to refining their skills. The elements of 4C should be incorporated in the 21st century learning skills: learning skills, information, media skills and life skills. Meanwhile, the works of Calvani, Fini and Ranieri (2011), Feola (2016) and Anthonysamy (2020) focused on the three dimensions of digital literacy: technology, information ethics and cognitive. This is the case for certain cognitive skills such as linguistic or logical skills, but much less for critical (e.g., evaluating information) and ethical-collaborative skills, or the ability to face new technological contexts.

According to Torres Gastelú, Kiss, and Lagunes Domínguez (2015), the basic competencies can be considered salient for proper scholarly performance. This dimension is related to activities such as interaction with others through digital media, use of models to explore complex topics, application of tools to find information from various sources,

productive use of applications, and use of primary informatics resources. In general, Hungarian and Mexican students demonstrate a highly positive attitude towards ICT competencies. Further, Köseoğlu (2015) found that students who are more confident and self-assured are more likely to attain higher levels of academic performance, implying that beliefs in self-efficacy seem to play an important role in predicting academic achievement. This is because students nowadays have been introduced to the internet and utilise it in their learning.

In accordance with this, Malaysian students are also expected to become digital netizens, especially by teachers (Mahadir, Baharudin, & Jamil@Osman, 2021) due to their continuous experience in and exposure to IT applications such as computers, smartphones, social media, and online games. Nevertheless, not all students are digital natives and have acquired the competencies to use technology effectively in obtaining the material needed for study purposes (Ilogho & Nkiko, 2014; Orsu, 2017). Lee, Leow, and Jie (2019) in their study on students at a private university in the Klang Valley, Malaysia found that the students are ready to move forward in terms of technology as they are comfortable with its use. Furthermore, they have access to personal IT devices for learning. However, the students are only moderately ready to adopt e-learning although they are open to the idea of learning new technologies and perceive e-learning to be simple and beneficial.

Further, most students lack the self-efficacy to learn something new that can help them perform in academia. Very few studies have identified the level of self-efficacy students, along with their reading literacy (Cantrell et al., 2013). Students with low self-efficacy are often mistakenly viewed as having poor academic performance. In this regard, Charles and Shaoying (2018) stated that in education, the synergy and collaboration between students and other factors are vital. Students who misjudge their aptitudes may sometimes flunk, a situation which makes them feel unmotivated.

Most schools lack the facilities and trained personnel needed to handle and configure the needs of 21st century classrooms. In other words, schools face difficulties in preparing the environment needed for 21st century classrooms to improve the teaching and learning process (Hendon & Abdullah, 2016). In addition, the lack of or low-quality facilities and connectivity in schools threaten to amplify the students' disadvantage (Warschauer, Zheng, Niiya, Cotton, & Farkas, 2014). Without the necessary infrastructure and connectivity, the integrated system which encompasses the online portal, virtual classrooms, and technical assistance that serve as enablers to the learning technology and culture is not accessible to rural schools and they will not accurately reflect students' digital competence or guarantee excellent results.

Both the infrastructure and technology used in schools are important as key enablers of digital technology-based education that can improve teaching and learning. However, another major impediment is teachers lacking the competencies and teaching styles needed for 21st century learning in the classroom. Students witness first-hand teachers' lack of digital literacy, and this can create a disconnect that may hamper the development of the digital culture (McEwan & McConnell, 2013). According to Estyn (2018), most teachers in schools believe that digital literacy caters for learners with additional needs well. They appreciate that digital literacy can be broken down into small steps so that learners can progress at their own pace. Generally, teachers feel more confident with the content of "citizenship", "interacting and collaborating" and "producing", than with "data and computational thinking". This reflects teachers' medium of understanding of the ICT curriculum as these skills have never been the focus of traditional education. The main problem for teachers nowadays is the need to reconsider not only what to teach, but "how to facilitate students' management of digital information" (Ferri, Grifoni, & Guzzo, 2020).

According to Terras and Ramsay (2016), there is a psychological lack of digital awareness as well as parental and family support towards IT influence at home. This is an important gap as parents' behaviour is closely linked to that of their child. Additionally, parents need to be concerned of their children's use of technology. They need to be more aware of their children's online presence as youths are the dominant group of smartphone and internet users. For example, one in three internet and social media users in the UK are below 18 years old. Despite their extensive usage, most of them are not aware of the breadth and depth of the internet. In this respect, Waheed (2019) highlighted that Malaysian youths demonstrated an understanding concerning online threats such as cyberbullying, but this does not mean that their understanding of the concept translates into safe behaviour online. The youths studied also did not seem to give their actions much thought and to a certain extent, underestimated the potential harm of their actions. Parents and guardians play an important role in promoting and supporting the development of safe online behaviour to their children. Nonetheless, digital safety awareness is currently low.

Recent studies have emphasised on the significance of parental and family practices regarding the use of technology within the domestic household. Parents often underrate the influence of IT usage and behaviour has on their children (Marsh et al., 2015). Mohamad-Noor, Kim, and Aaron (2020) found that there is a generational gap between Generation Y (children) with the older generations (parents), where Generation Y displays a stronger preference for digital media such as social networking sites (e.g., Instagram, Facebook) and other electronic word-of-mouth (e-WOM) platforms compared to the other generational cohorts. They actively utilise digital media platforms for the sharing of information more compared to older generations. These practices should lead to the adoption of good digital literacy practices within the home and school. Therefore, this paper proposes a conceptual framework guiding the practice of digital literacy in influencing student performance.

METHODOLOGY

A systematic review method was used to analyse the research literature relevant to digital literacy. A systematic review is a clearly formulated question(s) through systematic and reproducible methods that distinguish, select, and assess all relevant research to collect and examine their data (Thapa, Cohen, Guffey, & Higgins-D'Alessandro, 2013). All published research articles obtained and collated from Mendeley, Google Scholar, and several electronic databases subscribed by the author's academic library such as Emerald Insight, Science Direct, ProQuest Dissertation and Theses are shown in Table 1. After obtaining evidence from the research conducted on digital literacy, a preliminary study was conducted with two teachers to explore the important dimensions of digital literacy skills. The qualitative method employed was semi-structured interviews with these teachers to answer questions about experience, meaning, and perspective — most often from the perspective of the participant as the aforementioned dimensions usually cannot be calculated or measured using mathematical equations (Hammarberg, Kirkman, & De Lacey, 2016). The participants were selected using purposive sampling as teachers who actively teach the subjects of computer science and technology in school can provide in-depth experience and information regarding students' digital literacy. The identified dimensions resulting from the research conducted, review of past literature and preliminary findings from the interviews are presented in Table 1.

Table 1. Mapping of content analysis and preliminary findings

Variable	Dimension	Teacher A	Teacher B
Individual Factors	• Self-efficacy • Student perception and motivation Afshari, Ghavifekr, Siraj, & Jing (2013); Shamaki (2015)	• Most students lack interest in the classroom because of their inability to understand the subject.	• Not many students are willing to put in extra effort on the subject
Learning Environment Factors	• Facilities and infrastructure • Educational materials and tools • Teacher engagement Ghavifekr & Rosdy (2015); Gilavand, Espidkar, & Gilavand (2016)	• Lack of IT applications and facilities in school. • Teachers need to put in extra effort to teach the subject	• Inadequate IT applications in school. • Computer Science teacher needs extensive training in programming skills
Sociocultural Factors	• Family support • Language and social culture Ismail (2014); Harshbarger (2016)	• Inaccessibility to ICT applications at home.	• Most students do not have computer/ laptop or internet connection at home.
Digital Literacy	• Learning skills • Literacy skills Calvani et al. (2011): Bocconi et al. (2016)	• Students have basic knowledge and competencies on the Computer Science subject.	• Students lack knowledge and competencies on programming skills.
Student Performance	• Student performance Merkouris, Chorianopoulos, & Kameas (2017); Passey (2017)	• Students have failed their Computer Science test and examination	• Many students need extra lessons and attention from the teacher to finish the task.

DEVELOPMENT OF RESEARCH FRAMEWORK

Through the research process conducted on the literature framework and preliminary findings, a few frameworks were identified and analysed as relevant to this research. From the preliminary studies, it was found that three dimensions, namely individual factors, learning factors and sociocultural factors can be positioned as independent variables, while digital literacy was designated as the dependent variable representing student performance as supported by evidence in past literature. Students who take the Computer Science subject were found to lack knowledge on the subject and demonstrate low competencies in digital literacy. Two dimensions consisting of self-efficacy as well as student perception and motivation make up the individual factors. This is because students' self-efficacy (Afshari et al., 2013) and perception in executing programming exercises and lessons (Shamaki, 2015) have been found to be important predictors. For the learning environment factors, schools were found to have inadequate facilities to conduct lessons (Ghavifekr & Rosdy, 2015). Additionally, teachers need to attend extensive training for the Computer Science subject, especially in terms of programming. These were found as important factors impacting student performance (Gilavand et al., 2016). According to Ismail (2014) and Harshbarger (2016), sociocultural factors also contribute to the students' level of digital literacy as learning and literacy skills (Calvani et al., 2011) are important for 21st century learning and academic performance (Passey, 2017). The proposed research framework is presented in Figure 1.

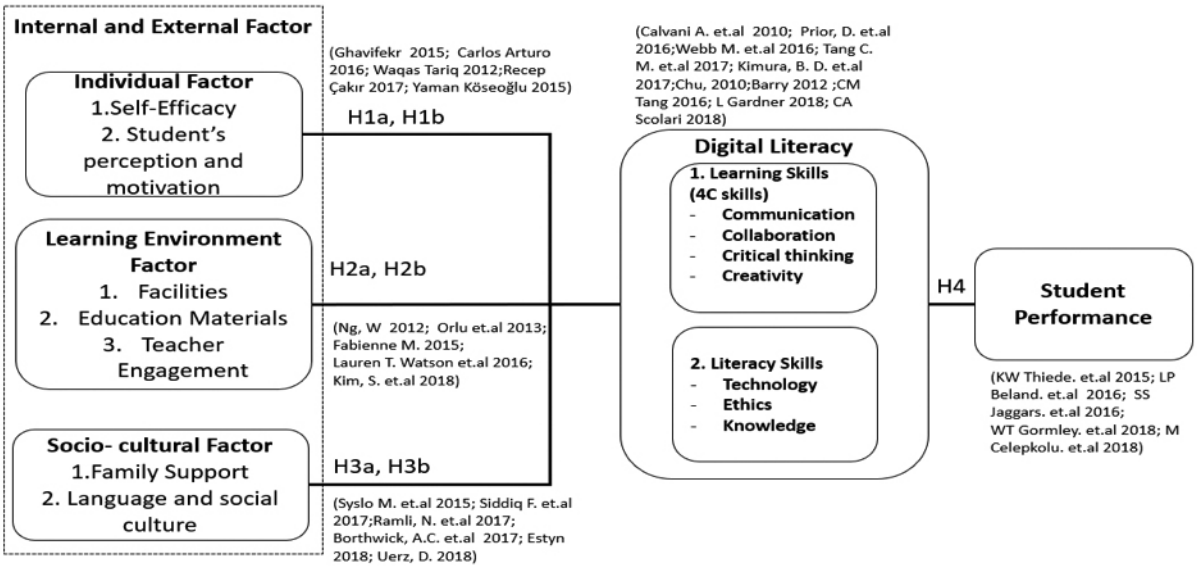

Figure 1. Conceptual framework of digital literacy towards student performance

From the findings shown in Figure 1, this study proposes three (3) main independent variables, namely Individual Factors, Learning Environment Factors and Sociocultural Factors, while Digital Literacy is proposed as the dependent variable. Through the systematic review conducted, this study further investigated the relationship between Digital Literacy and Student Performance. In the context of 21st century learning, students need to be high-skilled learners by becoming digital-information literate (Blaschke & Hase, 2015). They need to be flexible and innovative, implying that self-efficacy plays an important role in predicting academic attainment (Halsall, Kendellen, Bean, & Forneris, 2016). Self-efficacy in this context also includes how students navigate the digital world and use digital information ethically and socially. These issues are related to digital literacy dimensions that have influences on the relationship between 21st century learning factors and student performance. Many studies have proved that students' level of self-efficacy in technology reflect their digital literacy (Cantrell et al., 2016). Thus, students should be digital-information literate to use technology appliances in school, and this includes their consideration of all security threats.

Digital literacy should be incorporated in classes to allow students to explore the internet's online resources and databases and use email or social networking to communicate with others. Usman and Madudili (2019) mentioned that the school's physical facilities and culture also influence students' performance in 21st century learning. For the Learning Environment dimension, Siddiq and Scherer (2016) believed that teachers' computer competencies and teaching styles are important determinants of the integration of digital information literacy in teaching and learning practices. This dimension measures teachers' technological competency – in other words, teachers' aptitude to practise technology in general (not specifically related to teaching and learning) and competencies in using technology applications and approaches in class. In this respect, the learning environment plays an important role in enhancing the teaching-learning process for Science, Technology, Engineering and Mathematics (STEM) subjects (Warschauer et al., 2014).

The Sociocultural Factors cater to how parental support and guidance influence students' digital behaviour and good practices of digital literacy. Recent research has highlighted the importance of parental role and family practices in students' use of technology through multiple devices such as computers, tablets, mobile phones, and games

consoles within the home as good practices within the household can motivate students to improve their academic performance (Marsh et al., 2015).

According to Calvani et al. (2011), a general consensus has been reached on the need to pay attention to the more complex and conceptual aspect of digital literacy rather than to purely focus on the technical dimension of a technology. As such, Calvani et al. (2011) proposed three facets of digital literacy or digital competency comprising of the cognitive, technology, and information ethical aspects. Thus, students are expected to apply these three main aspects to explore the technological context in flexible ways, use their cognitive capacity to access, select and evaluate information critically, as well as interact and share their knowledge constructively in a responsible manner (information ethics). Digital literacy or competence is not just the result of simple elements of ability or instrumental knowledge, but a complex integration between cognitive processes and dimensions as well as methodological and ethical awareness. In this context, Calvani's model fits into the digital literacy skill framework through the elements of literacy and learning skills. The Technology Dimension also acts as the key factor in digital literacy and information ethics as it influences students' literacy skills —students in the 21st century are exposed to media, information, and technology literacy. Meanwhile, cognitive skills play an important part in learning as students in the 21st century must possess the 4Cs — critical thinking, communication, collaboration, and creativity for them to perform in school. Digital literacy facilitates the processes of interaction and participation and allows students to become active, rather than passive in interpersonal contexts (Scolari, Masanet, Guerrero-Pico, & Establés, 2018).

CONCLUSION

Digital literacy is an important skill that should be introduced at the school level as a part of the students' preparation for future jobs in the digital age. It is hoped that this proposed conceptual framework can be used to identify the factors important for digital literacy in the 21st century, more so in its influence towards student performance. If so, the framework will contribute to the improvement and implementation of digital literacy for 21st century learning amongst students in Malaysia. Moreover, the identification of internal and external factors of digital literacy amongst students will encourage both students and teachers to be well-equipped for 21st century learning and to share more knowledge through the learning process in schools. Thus, it is hoped that this proposed framework will highlight the digital literacy skills needed for student performance. With these insights, a healthy environment for 21st century learning can be cultured from within schools. Lastly, the proposed framework can assist the Malaysian government in aligning the education system with Malaysia's Education Blueprint 2013 – 2025 and prepare students with much needed skills such as digital literacy skills for future jobs.

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Coronavirus exacerbates xenophobia: Consciousness of Twitter posting during the pandemic

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ABSTRACT

Free speech is not a license for racists to spread propaganda. However, the outbreak of COVID-19 and its subsequent spread across the globe has left a shocking wave of disbelief resulting in an upsurge of xenophobia in the society. Racism is a system of dominance and power designed to uphold the racially privileged. This study delves into the consciousness of Twitter postings during the COVID-19 pandemic and deconstructs the power dynamics in the hashtags used. The study's data was analysed using Twitter Application Programming Interface (API) to identify the representation within tweet sample sets. The study concludes that social interactions on Twitter constructs power dynamics and these shared values create a new form of power resistance and subjugated knowledge. This leads to a discussion of power between social media intertwined with the machine learning tools in social science and humanities studies. This study contributes to the academic debates about the public sphere and social media's role in constructing meaning in cultural and social change. It also suggests that Twitter develops policies to prohibit hate speech and impose regulations to ensure that online spaces remain civil, safe, and democratic.

Keywords: ***COVID-19, power relations, racism, Twitter, xenophobia***

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INTRODUCTION

As the COVID-19 pandemic continues to wreak havoc across the globe infecting and killing tens of thousands, fear continues to pervade all societies. Undoubtedly, this pandemic has revealed social and political fractures in communities, with racialised and discriminatory responses to the pandemic fear that affect marginalised groups disproportionately (Haynes, 2020; "Stop the coronavirus", 2020; Zheng, 2020). A deplorable fear amid hegemonic rhetoric and counter-claims of distortion and falsification appears in the hegemonic culture by battling for legitimisation and acknowledgement of real encounters of open bigotry and microaggression within the group members in societies (Nakamura & Chow-White, 2013). Hence, times of crisis amplify the emotion and tension between groups. A particularly striking feature of this COVID-19 crisis is the coincidence of virology and virality that spread the virus quickly and misinformation about the outbreak creating panic among the public.

In an upsurging wave of xenophobia, people of Asian descent worldwide have experienced more violent reactions, especially on social media. Reflected in the news feed of social media users (i.e., timelines for posted user-generated content), millions of people use Facebook, Twitter, and Instagram platforms to provide opinions, join discussions, and disseminate race-related issues (Gan, Yaacob & Abdul Latif, 2021). On the other hand, speech that contains racist sentiments typically refers to the socially formed opinions of discrepancies between appearance, heritage, culture, or faith-based social classes (Matamoros-Fernández, 2017; Pantti, Nelimarkka, Nikunen, & Titley, 2019) that includes the categories of race, ethnicity, and faith (Silva, Mondal, Correa, Benevenuto, & Weber, 2016).

Over the last decade, there has been a remarkable growth in technological communication as a vehicle to communicate hateful, racist, and xenophobic sentiments, particularly during the epidemic (Bonilla-Silva, 2020; Khairulnissa & Aziz, 2021; Sylvia Chou & Gaysynsky, 2021). Furthermore, it is believed that the internet has facilitated the adoption of extreme violent beliefs and radical recruitment (Blaya, 2019).

In Malaysia, studies show that a majority of the racially charged comments in social media were anti-Islam/Malay sentiments, followed by remarks aimed at Chinese and Indians during the pandemic (Chin, 2020). Given that the content found in social media also represents their users' real-world interactions, there is an increased expectation that social media environments often reflect the norms of society. Thus, social media sites are constantly being requested to provide users with the tools to report offensive and hateful content (Connelly, 2019).

Despite the wide-ranging social psychological research into hate, prejudice, and stereotyping (Dahlstrand, Wigerfelt, & Wigerfelt, 2015), little is known about how power relations and otherness contribute to hateful offending behaviour (Eliassi, 2015). In particular, not much is known about the degree to which hateful online content is a possible risk factor that constructs negative attitudes and subsequent hateful acts (Synnott, Coulias, & Ioannou, 2017). In fact, the most prevalent form of hate speech on Twitter is racist sentiment (Silva et al., 2016). As xenophobia and racialised issues are prevalent worldwide, this study addresses the issue by delving into the consciousness among Twitter users during the COVID-19 outbreak and deconstructing the power relations embedded in the hashtags used.

LITERATURE REVIEW

Twitter and hate speech

Twitter, which was launched in 2006, has become one of the most popular social media platforms in Malaysia and worldwide. In fact, 2.63 million Malaysians actively used Twitter

in 2020, with a proportion of users aged 13 and above (Ilias & Zabuliene, 2020) displaying a considerable increase in percentage from 23.8% to 37.1% over the same period (Malaysian Communications and Multimedia Commission, 2020). According to statistics, Malaysia ranks sixth globally and first in Southeast Asia regarding mobile social media penetration. Meanwhile, based on data given by Hootsuite in 2020, the number of social media users in Malaysia increased by 1.0 million (+4.1%) between April 2019 and January 2020 (Kemp, 2020). In the meantime, Malaysia's social media penetration hit 81% by January 2020 (Hootsuite as cited in Kemp, 2020). This demonstrates that Malaysians are IT literate and tolerate the presence of technology in their daily lives. However, some considerations must be taken into account in the context of the Malaysian culture, particularly the misuse of social media, such as the transmission of fake news or seditious ideology, which might endanger national security and peace.

It should be noted that the presence of social media accounts with fictitious identities exists solely to promote derogatory remarks against other races and religions (Evolvi, 2018). In the past, in the absence of social media, it was challenging for certain individuals to spread slanderous or insulting words to another race. However, now with social media, these individuals can easily use various social media platforms to spread and manipulate fake news that is racist in nature. In a study conducted by Silva et al. (2016), they categorised a number of different hate categories and discovered that 48.73% of Twitter users are racists because they demonstrate racial attitudes and concerns on Twitter.

In Malaysia, a growing body of research has begun to look at social media as an online means of producing meaning, as a potential virtual public sphere, and as a platform for the development of the digital culture (Alakklouk & Mokhtar, 2017; Khairulnissa & Aziz, 2021). In fact, a slew of studies has focused on Twitter's crucial role in making sense of race and gender issues (Alexander & Chaudhry, 2016; LeFebvre & Armstrong, 2018; Shafer, 2017). Other studies that include Web 2.0 as part of the digital involvement in the public realm are more skeptical, only quantifying text-based hate speech (Davidson, Warmsley, Macy, & Weber, 2017; Saleem, Dillon, Benesch, & Ruths, 2017). This demonstrates how the evolution of scholarly attention to challenges in cyberspace has changed human-technology interaction.

As researchers can openly access social media and acquire public data without the need for informed consent or consulting the community under study (Linabary & Corple, 2019; Matamoros-Fernández & Farkas, 2021), they can identify and collect information more easily. Several academic investigations were prompted by the availability of user data combined with provocative occurrences. For example, in collecting Donald Trump's quotes and tweets, a study utilised only the top posts function of Twitter (Shafer, 2017). Another study focused on anti-Islamic hashtag-related speech and studied public Twitter data (Rzepnikowska, 2019). Meanwhile, critical approaches to the Twitter conversation have revealed xenophobic and racist sentiments as an expression of radical ideology (Alexander & Chaudhry, 2016). As a result, Twitter has helped promote the spread of hate speech and propaganda and made it easier for those with similar hateful ideas to make connections with one another.

Consciousness, power and knowledge

Racist discourses and practices on social media are essential yet complex topics of study. This study critically maps Foucault's foundational work power and knowledge as a critical precursor to combatting rampant inequality in modern societies, departing from Daniels' (2013) literature assessment. His philosophical works are well-known for their contributions to our understanding of coercive authority. The focus of this article is on how the power relations discourse influences the formation of hashtags on Twitter. Thus, this study examines the research issue using Foucault's notion of power/knowledge (Foucault, 1989) and the Foucauldian poststructuralist viewpoint on power, knowledge, and discourse (Lewis, 2017).

Notably, this research aims not to criticise Foucault's work or participate in arguments about other studies employing Foucault; instead, it reveals the underlying discourse that emerges via social media. According to Foucault, people's ideas of some social concepts and behaviours (e.g., madness, punishment, sexuality) are not fixed but rather show evident discontinuities between periods. He claims that knowledge is a historical product (Foucault, 1972). New knowledge is neither discovered nor created by the natural process of exposing pre-existing truth (knowledge evolution) or through the political endeavours of one social group toward enlightenment (knowledge invention) (Foucault, 1972). This is what the social media discourses have provided in the mediated world.

While much of his work focused on the power of knowledge/discourse, Foucault recognised that technological artifacts are also a powerful aspect of "technologies of power," as evidenced by his analysis of surveillance in Bentham's panopticon (Foucault, 1972) and the "instrumental coding of the body" through training with pencils and rifles (p. 153). However, it is important to emphasise that Foucault's approach to power differs from Marxist critical theorists, who focus on the structural mechanism of social or cultural reproduction (Smart, 2013). Foucault's system of knowledge necessitates identifying the authority and institutions that can speak of the knowledge. Hence, the power-knowledge nexus reveals how power is operationalised in the society from a completely new and distinct perspective as a productive force that is influenced by day-to-day activities.

Previous research has focused on whether social media serves primarily as a "safe haven" for groups and individuals to create and propagate counter-narratives to mainstream society's hegemonic norms and ideas (Dillette, Benjamin, & Carpenter, 2019; Mauro, 2020). There is also intense discussion of the role of media as an "online amplifier" for hate speech (Bilewicz & Soral, 2020; Luqiu & Yang, 2018; Ozalp, Williams, Burnap, Liu, & Mostafa, 2020). Nevertheless, most of the studies have been focused on hypothesis rather than broad-scale empirical work, and hence greater attention is required to address this evolving relationship in the context of Malaysia.

There are reasons to believe that the growth of new social media may bring new media dynamics, which could shift the building and formulation of societal discourses towards user-driven, participatory information interchange. Thus, traditional media no longer has "privileged access to discourse" (Van Dijk, 1998, p. 255), where power and discursive supremacy are simply imposed from the elite via mass media channels. Previous studies on the usage of Twitter (and other similar platforms) from a "critical" perspective for the development of ideology and power have underlined the need for additional research in this area (Bouvier, 2019, 2020).

Dominant discourses generate and disseminate power (and power relations) among people by influencing their attitudes and behaviours. Power is always encoded in media representations, and this frequently generates power relations. As a result, power relations are divided and mediated through knowledge creation, values, and beliefs. Significant emphasis was placed on the power of Foucault's work. The developed framework, a blend of Stuart Hall's "Representation" and Edward Said's "Othernes", is linked because both theories involve power production (Norena, Sulam, & Murad, 2017).

Discourses, ironically, are built on the foundations of language and representation. The discourse is constructed on interconnected knowledge systems formed explicitly from our shared values and information to construct the desired reality. As such, the method of comprehending social reality is congruent with Foucault's ideas. Simultaneously, Stuart Hall expanded on Foucault's work on the link between power and ideology. Although Foucault's theory relates to discourse, his theory implies that the act of representation, which entails meaning-making, modifies the power of relations. It is possible to say that representation equals power. More attention and focus on how power and dominance can be jointly formed through mass contact from the bottom up is required in filling the gap in literature.

Because Malaysia is a multi-racial culture, it delineates the new growing studies of non-whites and Asians using social media (Cisneros & Nakayama, 2015). Critical indigenous studies are rarely used as lenses to examine racism and hate speech on social media. Taking this into account and repeating Daniels (2013) and Matamoros-Fernández & Farkas (2021), this study delves into the consciousness of Twitter users during the COVID-19 pandemic. Simultaneously, it pays attention to how Twitter works by deconstructing the power dynamics implicit in the hashtags used.

METHODOLOGY

The intricacy of the theoretical framework and technique underlying this study and the enormous amount of data collected makes understanding and summarising the research conclusions a problematic effort. This study used a mixed-methods approach and followed a pragmatic research paradigm. The study looked into the issue by probing the level of awareness among Twitter users during the COVID-19 epidemic and deconstructing the power dynamics encoded in the hashtags used. As a result, this study is inductive in character, as no theory or hypothesis was evaluated at the outset. When interpreting the results, Foucault's power and knowledge theory is referred to.

Since web-based data collection has gained prominence among social science researchers to collect large amounts of data in social media (Golder & Macy, 2014), this study uses data mining from hashtag identification. Two hashtags, #*Tabligh Cluster* and #*KlusterTabligh*, were chosen as the unit of analysis. Multiplex network construction was thought necessary to address research issues, and hashtags are a technique to arrange important information about a topic in Twitter through data mining using hashtag identification (Small, 2011). From March 12 until May 12, 2020, data was collected via the Twitter Application Programming Interface (API). This particular timeline for data collection was chosen because it was during the first phase of Movement Control Order (MCO). However, the data was only available from April 10–May 12 due to the limited data extraction allowed from the free API.

The streaming API is the most used data source for Twitter research as large-scale quantitative data is based on raw data collected through this source (Dubois & Gaffney, 2014). It is a unique way of gathering data as it is "push" based, meaning "data is constantly flowing from the requested URL (the endpoint), and it is up to the researcher to develop or employ tools that maintain a persistent connection to this stream of data while simultaneously processing it" (Dubois & Gaffney, 2014). Twitter's streaming API provides users access to a random 1% sample of tweets. For this purpose, the third-party python module tweepy was used. In order to connect to Twitter's API, it needs to utilise a Phyton library called Tweepy. This module is used to stream live tweets directly from Twitter in real-time. Whenever a status update contains a keyword in the filter, its contents are saved in the JSON (JavaScript Object Notation) format for further use.

In the case of Twitter, we started a file in JSON format, which required a cleaning process before it was analysed. The section on "Compiling tweets" outlines the process for compiling tweets by using the streaming API enabled by Twitter. A cleaning process should accompany data compilation before the data can be analysed (Figure 1). The information extracted from the data analysis and compilation process is highly dependent on the quality of the data itself. Due to the unique properties of data mining, it is crucial to alter the data to create "raw material" suitable for the specified purpose.

As a social behaviour, tweeting is a discourse; hence this study looked for the hashtag and the assertion of discourse in individual tweets. Participants can voice their support or

disagreement in real-time updates via tweets. However, the "Twittersphere" is more than just a platform for expressing one's opinions; it is also a particularly conducive platform for dialogue and engagement during COVID-19 as participants can direct their comments to other individuals or groups, as well as reply to and respond to comments directed at them (Duncombe, 2019). Using Foucauldian Discourse to analyse the narratives and public vocabulary regarding power relations and knowledge production on Twitter, is one methodological approach. All tweets are presented anonymously (Fiesler & Proferes, 2018; Hoover et al., 2020).

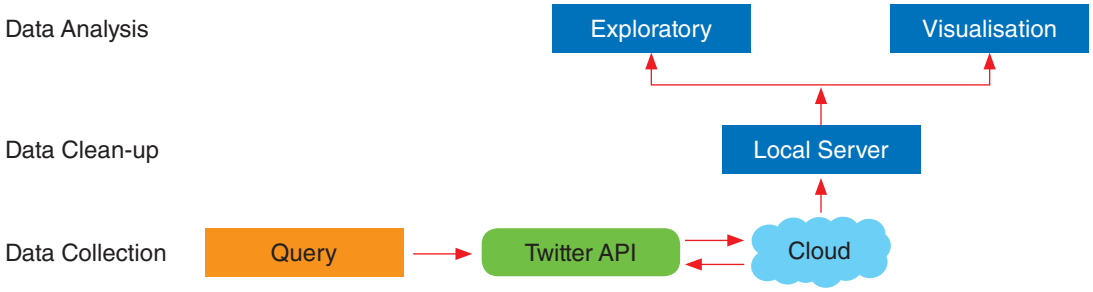

Figure 1. Data processing procedure adapted from Chen (2018)

FINDINGS AND DISCUSSION

This study conglomerated a dataset of 11,000 Twitter posts (tweets) from April 10 – May 12, 2020. These tweets show the early discussion and consciousness around the hashtags #*KlusterTabligh* and #*TablighCluster* during the pandemic. All the data was searched using the keywords "*KlusterTabligh*" and "*TablighCluster*". This timeline for data collection was chosen to coincide with the first phase of MCO. However, the data was only available from April 10 – May 12 due to the limited data extraction from the free API. The analysis is divided into two phases.

Tweet trend and consciousness

The resulting bar chart describes a number of particular trends as it presents peaks in correspondence for April 13 – April 19, 2020. According to Figure 2, April 18 shows the highest number of tweets. Hence, we can argue that this day represents the majority of Twitter users' activity. The increased frequency of tweets published can be attributed to numerous factors, such as the number of recovered patients discharged on April 18, 2020.

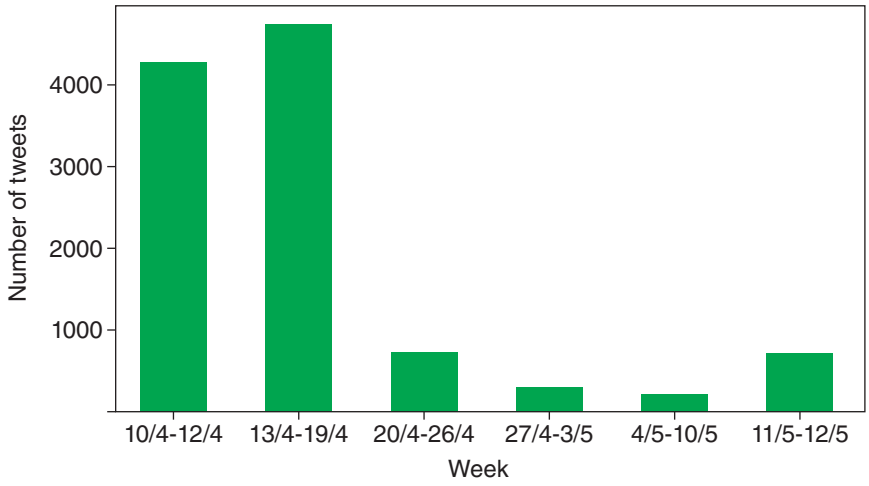

Figure 2. Frequency of tweets published from April 10 – May 12, 2020

Twitter trains human consciousness with constant connectivity through instantaneous communication. This is where the users can post, share, retweet and engage with other users instantly, anywhere. In fact, hashtags help users discover and add to current conversations, with Twitter serving as a kind of "neighbourhood of knowledge" which friends visit to obtain, exchange and communicate information (Gleason, 2013). Beyond the technological aspect of using machine learning tools, the hashtags (*#KlusterTabligh* and *#Tabligh Cluster*) carry an intrinsic philosophical weight, and that is one aspect of its value in this study. The theoretical and practical aspects interweave the cause and effect precondition each other beyond the homogeneity of sequential events during the pandemic and towards an intersubjective cycle of discourse and society.

In this study, Foucault's power and knowledge shape the theory behind the data analysis and interpretation of the empirical corpus of tweets, as shown in Figure 2. The findings reveal that tweets on this day (April 18) show the consciousness of using *#KlusterTabligh* and *#Tabligh Cluster*. Equally important, these Twitter users are mindful of their surroundings. This is related to the inner self and self-consciousness. When it comes to power relations using *#KlusterTabligh* and *#Tabligh Cluster*, the Twitter discussion, tweets, and retweets played a crucial role in power relations and knowledge production. This situation is based on the number of tweets and retweets that showed how users were conscious and unconscious of their postings. Hence the process of knowledge production was produced in the realm of the social world.

Word cloud

This section examines tag clouds from hashtags generated to gain insight into the vocabulary of Twitter users. The size of the words is related to the frequency of occurrence, i.e., if a word occurs more frequently, it will appear in a larger font within the word cloud. The word cloud is limited to 50 of the most popular words, and similar words will be grouped. This study employed Wordle's online text analysis tool to display commonly occurring words for the word cloud analysis. Figure 3 exemplifies Wordle's usage for preliminary analysis. All words were normalised, and stop words (e.g a, an, the, etc.) were removed from the corpus before visualisation. As seen from the word cloud, the frequency and usage of the purple color denotes the most used word in the postings. Prominent words like "*diisytiharkan tamat*", "*Mei satu*", "*terkini*" etc., were used to reflect the sentiments in the tweets. Word clouds are helpful because they reveal new information about the terminology used by the public. More prominent words indicate that the word appears more often throughout the text. It is noteworthy that these statements indicate that many people are concerned about this cluster and hoped that the pandemic would soon be over. First, it is essential to note that there have been many complexities in defining and dealing with hate speech. It is believed that by analysing these words, useful information for better understanding the core causes of hatred can be obtained. Specifically, what are the common words that are considered hate speech, and how are these words considered hate speech.

Figure 3. Word cloud from analysis

Representation of #tablighcluster and #klustertabligh

Even though COVID-19 is not confined to any borders and does not recognise nationality, ethnicity, or creed, the virus is frequently depicted in public discourse as a disease of "the other" (Ivic & Petrovic, 2020; Rosa & Mannarini, 2020). While COVID-19 has became a global epidemic, any reference to the origin of the coronavirus indicates xenophobic and racist language patterns that associate ethnicities and geographic regions with diseases. In fact, these othering discourses fuel the growth of xenophobia, racism, and democratic crises.

According to Foucault (1980), discourse is not only constituted by existing social formations and historical accounts but is also constituted by social groups, subject positions, and identities. This can be applied to current situations during the pandemic, where Twitter users tweet and retweet about #*KlusterTabligh* and #*TablighCluster*, thus demonstrating how knowledge production is constructed.

Hashtags, discursive and user-generated, have become the standard way to mark collective thoughts, ideas, disputes, and experiences that would otherwise stand alone or be swiftly submerged inside Twitter's fast-paced environment. It demonstrates that narratives based on Twitter hashtags evolve faster than narratives based on traditional media and that Twitter has become one of the most critical vehicles for spreading information to the general public. Figure 3 depicts the usage of humour and sarcasm throughout the discussion. Figure 4 illustrates users utilising several symbolic resources as part of clear reasoning of racism. This resulted in a lot of likes and retweets.

Furthermore, by defining the bounds of the discourse to follow, the signifying hashtags #*TablighCluster* and #*KlusterTabligh* invited an audience, much more so than the posting of a tweet to one's followers. It should also be noted that the twitterer is a member of a wider community and demonstrates awareness of the practice, discourse, and the group's worldview.

Figure 4. Tweets of #*KlusterTabligh*

This type of construction, in particular, creates resistance or transforms dominant forms of knowledge and a part of memory in the midst of upheaval and flux during the hikes on April 18. In fact, Twitter users create and employ hashtags based on their understanding of permanent visibility and self-regulating normalisation. Foucault (1989) proposed that the individual's life is autonomous, independent, and self-sufficient but maintains that it is already one of the primary effects of power where specific actions and discourses are formed among individuals. Foucault also maintained that individuals' subjectivities are purposefully formed and employed to serve a specific system and order of hierarchies. This construction is founded on the language employed, which acts as a mechanism to change settings into individuals, giving rise to the term "subject."

In the speech examined in Table 1, the "us" vs. "them" dichotomy reaches a crescendo. The majority of the tweets can be interpreted as individualisation. This racist outburst is related to the inner self, which demands that the racist be better than others. The influence of hashtags such as #*TablighCluster* and #*KlusterTabligh* is frequently cited as an example of how this process may bring injustices to the attention of a wider public, increasing pressure to hold criminals accountable, and even leading to power relations challenges (Bouvier, 2019). The study also discovered that a significant proportion of tweets were conveyed either by reinforcing negative other-presentation or comparing the self and the other. This collective voice was represented by utilising the words '*Kau*' and '*Aku*' to demonstrate empowerment. Racism, once again, is about a damaged character. It is all about hubris and arrogance.

Table 1. Tweets samples with themes

#KLUSTERTABLIGH* and *#TABLIGHCLUSTER	
CAUSES	**ISLAM**
For now, the tabligh cluster is enough been insulted by non Muslims. Don't wait until there is a cluster of mosques to be insulted more by haters of Islam.	"It is proven that the Malaysian and Thai tabligh clusters are very disciplined."
Datuk Dr. Musa needs to maintain morale and ethics as a medical practitioner and as a Muslim. Social media should not be used to incite hatred.	The wisdom of the tabligh congregation cluster. They show the world islam is not terrorist. Islam itself is full off love. Peace…
Why do they suddenly heat up the issue of prejudice and hate towards Rohingya? As to the point of wanting to fight and kill them? Is it because of PKPD in the Pasar Borong Selayang?	SHAH ALAM: The Selangor Islamic Religious Department (JAIS) confirmed that 33 individuals were detained on suspicion of gathering for congregational prayers at several mosques.
Tabligh clusters constitute the majority of COVID-19 patients.	Title: "ISMA defend a liberal portal for tarnishing image of tabligh congregation - Portal Islam dan Melayu | ISMAWeb"
This Tabligh cluster should not have a positive case for everyone who is aware of it there is contact with the latest.	The frequency of #COVID19 infection among Muslims is very worrying.
Being an onion ranger is also tiring. We used to fight with cluster tabligh's carriers.	@khairizulfadhli Why can a tabligh cluster be patient and listen to instructions? That is why Islam teaches"
You're the one who cursed the tabligh. Then there is the so-called cluster Elysium.	

Table 1. (con't)

#KLUSTERTABLIGH* and *#TABLIGHCLUSTER	
CAUSES	**ISLAM**
You can blame PH because the tabligh cluster was allowed by PH since PH follows WHO info instead of following Taiwan and Hong Kong.	
If there is a tabligh case, the virus is still there. Look now!	
"text": "RT @sebenarnyaMY: COVID-19 Outbreak In Ranau District Caused By 14 Individual Cluster Tabligh.	
The cause of the tabligh cluster is Malaysians not perpetrators.	
So now Malaysians can point fingers at you\ ud83d\udc46 because you are the cause of the tabligh cluster. You are really bad lid. The people will never trust you again.	
"title": "News | 38 Tabligh Akbar Gowa Participants from Banyumas Cause New Corona Cluster.	
Cases of COVID-19 infection involving tabligh clusters have not been reported stopped so far and it has spanned up to five generations of infection.	
Many people condemned this tabligh cluster.	

Multiple systems of power

The discourse constructed in Twitter was radical in the discursive opportunity structure when it made connections between multiple systems of oppression. Some users were conscious when they retweeted the tweet and understood it was racist content. Most users seemed unconscious in re-tweeting *#TablighCluster* or *#KlusterTabligh*. Beyond understanding racism, as grounded in the history of Malaysia, some users connected specific instances by bringing up the racial issue card. There was also a connection of systemic racism to the economy, where some used apartheid as a trend and connected it to *#TablighCluster* and *#KlusterTabligh*. For example:

> User 1: "Malay is such a nuisance, same goes like *#klustertabligh*!
> User 2: "Let's treat *#clustertabligh* like apartheid, #%#@%@#%...."

Twitter users made connections between other issues and *#TablighCluster* or *#KlusterTabligh* and between racism and other systems of oppression. Some felt empathy, and some had a sense of humanity. A few users also connected their tweets about *#TablighCluster* or *#KlusterTabligh*, defended them, and showed their struggle against this disease. For example:

> User 3: "We are all human, so does them *#clustertabligh*"
> User 4: "Why blame *#clustertabligh*? Why? Why?"

These tweets demonstrate that they were conscious and believe these systems of power were connected in some way. They brought up the issue to show the struggle against classism. Again, it demonstrates that #*Tabligh Cluster* and #*KlusterTabligh* as the minority voice and employs a wide range of discursive strategies to navigate sensitive pandemic situations.

CONCLUSION

Twitter has become a public sphere for communication and contestation. Hence, it allows certain imagined collectives to emerge as a networked public. During the COVID-19 pandemic, these imagined collectives have been shared through Twitter with the public. This study helps to demonstrate the importance of reviewing power relations in Twitter by considering machine learning tools to mine the vast exhaustive data. During the pandemic, social media, especially Twitter, has become the public sphere for communication. Indeed, Khosravinik (2017) was concerned that the advancement of media communication technologies has transformed "new interpretations of relations between text producers and consumers, as well as new (potential) arenas for public sphere debates". Both the literature review and the experiment reveal that hate speech is on the rise in social media; hate speech is a new worldwide challenge that threatens the peaceful coexistence of people in civilised society as hate propagators exhibit little sorrow or repentance.

On the other hand, the findings also reveal that social interactions in social media constructs power dynamics, the process of power constructions and relations as outlined by Foucault (1989), in which the magnitudes of power are unfixed and continually shift in today's reality. At the same time, the functionalities of Twitter that enable certain forms of communication within and between the networked publics add to a larger communications framework, resulting in a new form of power resistance that projects the subjugated knowledge. Hence, pairing and examined through the lens of othering, the shifts become exceptionally apparent and can drive one to contemplate a fundamental rethinking of modern technology and its uses in today's world. With the dawn of new technologies, human desires are under control. If we can filter with the right attitude and knowledge, humanity can be restored and molded.

The significance of this study is twofold. First, the study echoes Daniel's (2013) concern by demonstrating that it is possible to implement a technology that pinpoints who says what through opinion mining, that is, to track hate speech in a microblogs like Twitter, which can be expanded to other social media platforms. Second, this study contributes to the academic debate about the public sphere and social media's role in constructing meaning in cultural and social change. Specifically, this study hopes to contribute to a better understanding of the scope and pervasiveness of online racism — both the crass "frozen" variety and the subtler varieties that go unreported. While our dataset allows for some broad generalisations, it should be stressed that additional studies are required to support, validate, and extend these findings and refine them. Further, it is proposed that Twitter and other social media platforms adopt comprehensive policies and practices to prohibit hate speech and impose strict laws and restrictions on social media to ensure that the digital realm remains a civil, safe, and democratic space.

However, future studies could investigate the motivations of the authors of the contents posted on Twitter as investigating such motivations was beyond the scope of the present study. It can be concluded that Twitter has to merge human desire, and this is the ultimate subjugation and othering of knowledge, where humans are under control while machines become more intelligent than humans.

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The effectiveness of social media in raising awareness of Movement Control Order (MCO) during the COVID-19 pandemic

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ABSTRACT

The media plays many important roles in providing information to the public through various platforms, both in traditional and digital forms. In March 2020, the Malaysian government announced the Movement Control Order (MCO) due to the outbreak of COVID-19. COVID-19 is an infectious disease caused by a newly discovered coronavirus which continues to affect millions of people across the world. Social media platforms have been working diligently in making sure that communities are updated with news regarding personal safety and information on the MCO. The study aims to identify the effectiveness of social media in promoting awareness of the MCO. The study involved 440 respondents from different backgrounds across Malaysia and the data collected was analysed using Statistical Package of Social Science (SPSS) Version 23. Findings indicate that social media has a significant impact in promoting MCO awareness with 34.9% of the variance of MCO awareness explained by the proposed model.

Keywords: ***Social media, COVID-19, awareness, Movement Control Order***

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INTRODUCTION

COVID-19 (coronavirus disease) is a respiratory illness caused by the SARS-CoV-2 virus and was first detected in Wuhan, China in December 2019. There was a reported link between many patients in Wuhan with a large seafood and animal market that suggests animal to human spread. However, due to the growing number of patients reportedly not exposed to the animal market, it was confirmed then that person to person spread was taking place in Wuhan (Pantai Hospital, 2020). As of April 2, 2020, a total of 1,000,829 cases of COVID-19 were reported worldwide, with 51,356 deaths and 210,199 recoveries. The highest number of cases of COVID-19 were in the United States with 235,747 cases, of which 10,324 recovered and 5,620 died (Worldmeter, 2020). In Malaysia, the pandemic recorded 3,116 cases, 767 recoveries and 50 deaths (Ministry of Health Malaysia, 2020) as the number of cases kept increasing day by day.

In order to contain the outbreak in Malaysia, the government decided to enforce Movement Control Order (MCO) starting March 18, 2020. During the MCO, members of the public were not allowed to go out except for the head of the household for necessary errands such as buying groceries or food. When the situation was brought under control, the government replaced MCO with CMCO which refers to Conditional Movement Control Order or *Perintah Kawalan Pergerakan Bersyarat* starting May 14, 2020. During the CMCO, a few sectors were allowed to open, and people were allowed to go to work but with strict adherence to the Standard Operating Procedures (SOPs). The SOPs were drafted by the government to contain the outbreak and to prevent the transmission of COVID-19. After almost 80 days under MCO and CMCO, the government managed to control the crisis as cases showed a decrease in numbers. After which, Malaysian was placed under the Recovery Movement Control Order (RMCO) or *Perintah Kawalan Pergerakan Pemulihan* (PKPP).

During the outbreak, social media played an important role in providing information and keeping the public updated with the number of cases as well as measures taken by the government to contain the situation (Gan, Yaacob, & Abdul Latif, 2021). According to Fernandez (2020), COVID-19 has exacted wide-ranging effects on millions of people across the world and the media has been working diligently in make sure that communities stay updated with related news and vital information (Ridzuan et al., 2012). Government agencies, in particular the Health Ministry, always updates the public using social media on vital information such as personal safety, SOPs and rules and regulations concerning MCO. In fact, social media platforms and various accounts disseminate this information in various forms and formats to keep the public interested and vested (Tengku Mahamad, Ambran, Mohd Azman, & de Luna, 2021).

PROBLEM STATEMENT

Despite the stringent procedures and movement restrictions in place during MCO, a total of 828 people were detained by the Royal Malaysian Police (PDRM) (Abdul Karim & Adnan, 2020). These violators wanted to "hang out" during the MCO and were detained for violating provisions under Section 186 of the Penal Code (KK)/7(1) of the Prevention and Control of Infectious Diseases 2020 (Nasri, 2020).

In addition, there were concerns for those who attended the tabligh congregation at Masjid Sri Petaling (Yaacob, 2020) in early 2020 because most of the local cases were recorded from here. The police force analysed the data of 40,000 individuals who

underwent screening tests and predictive analysis revealed that the tabligh congregation was a COVID-19 cluster and any person who had close contact with its participants was likely to be infected with COVID-19 ("*Covid-19: Polis analisis 40,000 data*", 2020).

In addition, according to Abdullah (2020), Sarawak recorded the highest percentage in adopting preventive measures when COVID-19 hit the country, as opposed to Sabah and Penang which recorded the lowest percentage. This indicates that the awareness among people was still low during the pandemic even though the number of cases kept rising in Malaysia. Research done by Maidin, Sakrani, Wahab, and Razal (2019) also showed that social media is not effective in delivering information to the public. As most research on COVID-19 had been conducted overseas, this study hopes to shed some light on the effectiveness of social media in the context of Malaysia. More specifically, this research will use awareness of MCO as the dependent variable in relation to social media effectiveness.

Research objective

- To identify the relationship between the effectiveness of social media and the awareness of MCO.

Research question

- What is the relationship between the effectiveness of social media and awareness of MCO during the COVID-19 pandemic?

METHODOLOGY

Research design

The study employed a quantitative approach using online survey. The link for the online survey was distributed through social media platforms such as WhatsApp, Facebook, Instagram, and email. By using social media platforms, it was easy to reach the public as the study is focused on public response towards the effectiveness of media in promoting safety and raising awareness of MCO during the pandemic.

Sampling technique

The study used convenient sampling which is a nonprobability sampling technique. This technique selected respondents from the public with various occupations, in both government and private sectors such as self-employed, housewife, retirees, students and unemployed. The total number of respondents for the survey was 440. In reference to Krejchie and Morgan's able, 384 is the minimum number to represent the whole population of Malaysia (Krejchie & Morgan, 1970).

Research measurement

The survey consisted of 51 questions including the demographic section. The questionnaire items were related to the research objectives of the research and the main variables which were social media effectiveness and MCO awareness. The questions were designed in the ordinal, nominal and 4-point Likert scale format to collect data for analysis using the Statistical Package of Social Science (SPSS). The questions were reliable and valid to help respondents understand and answer the questions (Ridzuan et al., 2017).

Data analysis

The software used for the data analysis was SPSS software version 23. The collected data was subjected to analysis on percentage, mean, Independent Sample t-test, Anova for descriptive statistics and multiple regression for inferential statistics.

DATA ANALYSIS AND FINDINGS

Multiple responses

The most common social media platform used to obtain information about COVID-19 was Facebook (23.6%) followed by WhatsApp (21.5%). As stated by Askew (n.d.), 51% of people who have online access rely on social media as a news source. This is also one of the reasons for the continued popularity of social media platforms.

Table 1. Most frequently used social media platforms

Social media	Responses	
	N	Percent (%)
Facebook	279	23.6
WhatsApp	254	21.5
Others	188	15.9
Instagram	182	15.4
Twitter	171	14.5
YouTube	106	9.0
Total	1,180	100.0

Regression

A multiple linear regression analysis was performed to determine the predictor and its contribution towards the criterion.

Table 2. Regression results of effectiveness of social media and awareness of MCO

Coefficients						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	2.298	.119		19.238	.000
	Social media	.135	.028	.205	4.877	.000
a. Dependent Variable: MCO						

Table 2 shows that there is a relationship (statistically significant, $\beta = .205$) between the effectiveness of social media usage and the awareness of MCO during the COVID-19 pandemic. This finding is aligned with Kushner (2020), Ridzuan et al. (2021) and Askew (n.d.) who commented that various platforms of social media such as Facebook, Twitter, Instagram etc. are effectively used to provide information such as number of deaths and COVID-19 clusters, not only in Malaysia but also international news related to the pandemic.

DISCUSSION AND CONCLUSION

The findings of the study reveal that the media is effective in promoting awareness of MCO and to obtain information during the COVID-19 pandemic. The public is more aware when information is received through social media. Thus, the study suggests that government agencies should use social media more frequently and effectively to help the public understand measures taken by the government for their safety such as MCO. For future research, the researchers intend to extend the current study to other social media platforms such as Telegram, Snapchat and Tiktok.

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Impact of social behaviour on the new normal ICT structure during the COVID-19 pandemic in developing countries

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ABSTRACT

During the COVID-19 pandemic, Songkhla Rajabhat University in Thailand, like many other educational institutions worldwide, was ordered to close and shift to online teaching. This paper proposes the impact of the crisis on the network traffic and application demands of the university ICT network. The impact constructs the new normal social behaviour of ICT and duality of structure. During the online learning period, the number of active users and the demand for the video usage increased dramatically. In addition, the number of devices synced, drive storage, email storage, and photo storage also increased. This paper tests the theoretical framework of structuration by evaluating the relationship between these impact factors and new normal social behaviours that we need to be concerned of to prepare for future crises. The evidence of technology integration and structuration of Songkhla Rajabhat University during the Covid-19 pandemic matches Anthony Gidden's Model for the Dimension for the Duality of Structure. This proves that immense structuration in an institution could happen through societal contribution, entirely in an online setting — defining a New Normal for the society.

Keywords: ***Duality of structure, ICT, new normal, social behaviour***

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INTRODUCTION

The novel coronavirus has exacted a heavy toll on the world population and deprived the world medical community of its resources and workforce. In 2020, the World Health Organization (WHO) officially declared the coronavirus a pandemic just two and a half months after its outbreak in China (Kim, 2020). At this point, the outbreak had escalated in countries like Thailand, where the country would witness the highest number of confirmed cases in a week from when COVID-19 was declared a pandemic (Emergency Operations Center, 2020). Noting the new spike of cases in the country and also in neighbouring countries such as Malaysia and Singapore, the Royal Thai Government imposed a national curfew of 4 am-10 pm from April 5 onwards ("Curfew starts on Friday", 2020.). The government also mandated a 14-day quarantine for Thais arriving from abroad starting from April 2 (Post Reporters, 2020). During this time of crisis, Thais utilised social media as well as other ICT platforms for information processing and coordination. This included dissemination of information and facilitation of interactions between groups of people (Leong, Pan, Ractham, & Kaewkitipong, 2015).

This essentially means that most of the population prefer to obtain information from friends or family members rather than fully trust the official media or government announcements, especially those with restricted access to a variety of information sources. More importantly, this reflects the importance of establishing an efficient form of communication before the climax of any crisis. During the Thai Flood in 2011, the handling of information was confined to a one-way communication between the government and the Thai meteorological agencies. As a result, the general public was left out of the information loop and was not given any meteorological data that would indicate a flood warning (Kaewkitipong, Chen, & Ractham, 2016). The same situation happened at the onset of the COVID-19 pandemic in Thailand, where the government downplayed the outbreak, and the authorities withheld information.

This is where Thai social media plays a role in the sourcing of information. People would be able to determine their needs and contact others for critical information during the COVD-19 pandemic. Such instances of communication include group messages on social media platforms. Members of the public mainly relied on Facebook and Twitter accounts of influencers or those with vital information on COVID-19, including the Ministry of Health account (Khairulnissa, Logeswary, Manimaran, & Aziz, 2021).

In Thailand, social media platforms such as Facebook Messenger and LINE are commonly used as mobile texting applications in daily life. The role of these platforms is to convey written text messages or media over internet-enabled systems between persons and groups; as such, these platforms can be extended as a form of crisis communication. Further, the variety of media that could be sent using these platforms is not only limited text but also includes images, documents, videos, and audible files, across multiple people and multiple devices.

In the 2011 flood in Thailand, the victims were in a similar state as the COVID-19 pandemic; most of the desperate victims experienced restricted mobility since they were confined to their residences or a particular shelter. Hence, the communication between these isolated groups of people and the government are considered critical and vital towards their well-being and safety. During the flood, TV and radio stations, which were trusted by the government, presented false or insufficient information to the public regarding the growing flood-prone areas and locations affected. Thais then turned to social media, such as Facebook Groups, to request aid from NGOs (non-governmental organisations) and the army using direct communication (Kaewkitipong et al., 2016).

In developing countries like Thailand, Google has signed agreements with Thai universities where Google has offered use of its applications for free. Songkhla Rajabhat University has been a signatory to such an agreement to use Google for education since 2013.

This research intends to understand the social behaviour that takes pace in a crisis by comparing the data usage of the Google platform. The findings of this research would prove useful in planning ways to cope with the surge in internet usage during such periods. If an emergency occurs in the future, everyone can access the internet equally, especially for full online teaching and learning in the future.

LITERATURE REVIEW

During the COVID-19 pandemic, the use of the internet to support teaching and learning increased significantly; however, very few research has been conducted on this topic. For example, although internet traffic increases, data is lacking on the sources and the number of people using the internet. Furthermore, there is no specific plan or clear practice recommendations to support the surge in internet usage during critical moments. According to a study conducted in China, face-to-face activities drastically decreased during the COVID-19 pandemic, while online services were aggressively marketed, resulting in increased internet usage. The study found that 46.8% of the participants had increased their reliance on the internet, and 16.6% had increased their internet usage hours (Sun et al., 2020). Because the internet is a bridge to connect people, the medium is used in all forms of work, including work from home and the education sector. The education sector, schools were temporarily closed and universities started online classes (Lee, 2021). The internet had become indispensable to the working world during the crisis in 2020. It supported both the workforce and economies which had been affected since March 2020. The increased usage was also caused by travel and movement restrictions in groups or communities. Similarly, most of the universities in Thailand required everyone to work remotely from home.

The COVID-19 pandemic had affected all industries in many aspects but it had a significant impact on the educational community in many ways. Since the closure of physical classrooms and school, teacher have had to adapt to teaching remotely, and the resulting economic difficulties also led to high numbers of school dropouts. On the other hand, COVID-19 became a driving force for new technology and educational breakthroughs as educational inequity grew. These changes enabled youngsters across the world to study on their own using various forms and models that matched their environment. The impact of COVID-19, which caused most classrooms to be shuttered and shift to online instruction at all levels, raised the need for technology, prompting internet service providers, as well as schools and institutions, to supply greater high-speed services. This is particularly so at universities as its operations must be go on. Furthermore, students log in for their lessons through the institution. As a result, university internet providers had to extend their services and include new channels.

Undoubtedly, the internet is increasingly vital for every household because aside from being used for remote work from home, it is also used by students learning at home as well. The amount of internet usage has increased as well. The COVID-19 pandemic has essentially given telecommunications companies a huge challenge in having to sustain and upgrade their networks and operations in the face of unprecedented high volume of usage, as well as managing and alleviating societal stress imposed by unexpected and abrupt changes (Miteva, 2020). Being able to support high volumes of internet usage is therefore important especially in times of crisis. In an attempt to emulate other countries

that have embarked on e-learning approaches, Nepalese medical institutions debuted remote teaching and learning methods. Medical schools have been compelled to devote more energy, inventiveness, and money into adopting e-learning techniques of teaching as a result of the lockdowns caused by COVID-19. Although e-learning at medical schools is still in its infancy, it should be taken into account when developing national educational plans, in particular. Medical schools can frequently give supplementary online materials and training to professors and students to help them better utilise e-learning tools. However, it should be taken into account that Nepal is a resource-constrained country with a rural population of 80.26% (Pandey & Aryal, 2021).

Since there are no matching theoretical framework available to analyse the social interactions and survival structure of educational institutions during the COVID-19 pandemic, a significant approach would be to map the route from internal agency-level interactions to structural change and implications of the "new normal" during the pandemic. By applying the structuration theory, a route could be mapped on a case-to-case basis by using the raw data obtained from the Google Applications platform used by institutional members of Songkhla Rajabhat University, within the related timeline of the governmental COVID-19 policy. In the initial structuration theory by Anthony Giddens (1984), technology was hardly mentioned. However, today, the structuration theory is regarded as applicable in understanding the unexpected changes in IT development and implementation, which are the changes currently being witnessed in educational institutions as a result of the COVID-19 pandemic (den Hond, Boersma, Heres, Kroes, & van Oirscho, 2012).

Structuration holds accountable the human interactions and social structure, which Giddens put forth in three concepts: the duality of structure, time-space relations, and actor's knowledgeability. Duality is the two-way interaction between human actions and structural shifts. The structure dynamically changes and emerges from a constant variation of human action; simultaneously, the structure also controls and inhibits the modes of human interaction. Time and space, according to Giddens' definition, are the narratives surrounding a particular time and place. Hence, structuration could considered under the same context in any timeframe and location, and the social interactions are confined within a specifically descriptive time and place only (Giddens, 1984). Next, actors are entities that play a crucial role in structuration; the phenomena are voluntarily motive by actors; thus, these motives are knowledgeable and driven logically according to the actors' intentions (Giddens, 1984).

RESEARCH METHODOLOGY

In this research, Giddens diagram, see Figure 1, with dimensions of the duality of a structure, was used to interpret organisational response and internal social interactions and to map the route of institutional structural change based on the availability of existing technology. This method of using Giddens theory highlights the interaction between structures inside institutions like universities. In this diagram, Giddens highlights the duality dimension, interaction dimension, and the different modalities between these dimensions. First, actors or participants in organisations such as university are considered connected through communication, which is one of the interaction dimension; thus, it influences interpretive schemes and finally reaches the structuration change dimension of significance, which is the participant's understanding of the societal changes and shifts. This is the first step in aligning the Giddens theory with the reality of the COVID-19 situation in Thai university campuses. Then the structuration domination emerges from participants inside the organisation who exercise power through initiated facility and

resources available; domination is the knowledgeable allocation of these facilities and resources, which relates to the availability of technology which would be analysed further. Giddens' structuration would be a reason to explain the shift of the organisation, governed by the data gathered during the lockdown period, which alternatively could be defined as the structuration process. Finally, the dimension of legitimisation occurs when social interactions demand sanction to impose norms or the normalisation process. Sanctions could be interpreted as positive or negative (Kaewkitipong et al., 2016). Time as well as space is also defined in this case study as these contexts should be precisely defined and integrated well with the available data.

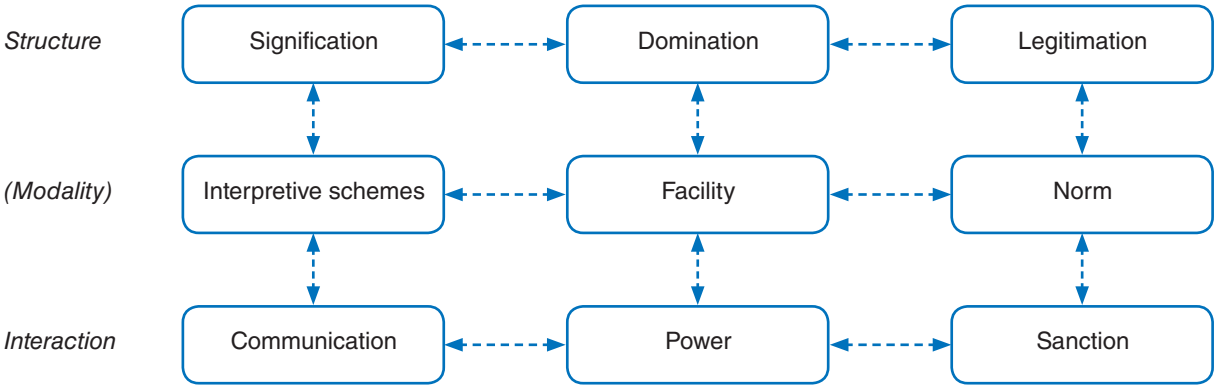

Figure 1. The duality of a structure (Giddens, 1984)

RESULTS

Since March 17, 2020, Songkhla Rajabhat University was ordered close by the Thai government and all students, teachers and workers were mandated to work from home. Figure 2 shows that the overall (in-out) network traffic in the campus decreased dramatically after the university was closed on March 17, 2020.

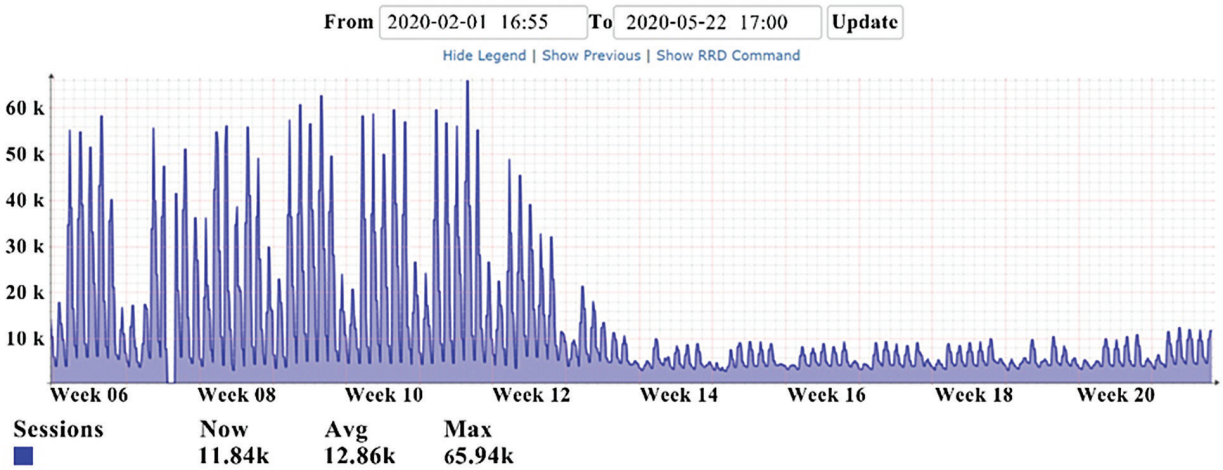

Figure 2. Network traffic report at Songkhla Rajabhat Gateway

Figure 3 shows the number of active users of all Google+ services for six months for intervals of 1-day, 7-day, and 30-day, respectively. April reflected the maximum number of active users for all Google+ services for 7-day and 30-day even though April was the university's summer semester (Table 1).

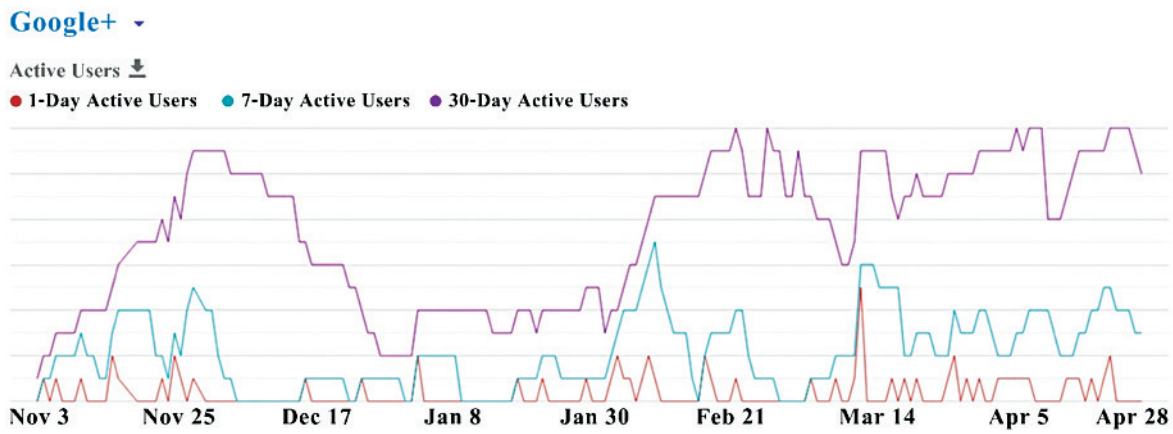

Figure 3. Number of active users for all Google+ services

Table 1. Sum of active users who used Google+ services

Active users	1-Day	7-Day	30-Day
Nov-19	10	59	135
Dec-19	2	22	216
Jan-20	5	30	117
Feb-20	13	84	247
Mar-20	15	79	284
Apr-20	15	96	322
Grand Total	60	373	1,333

Table 2. Number of active users who used Video Hangouts

Year	Month	Sum of Video Hangouts
2019		5
	Nov	3
	Dec	2
2020		2,394
	Jan	5
	Feb	17
	Mar	573
	Apr	1,799
Grand Total		2,399

Table 2 shows the number of active users who used Video Hangouts which increased dramatically after March 2020. The number of active users who used Video Hangouts in April was unusually very high, more than usual. Figure 4 shows a more detailed picture of the increase in number of active users for Video Hangouts.

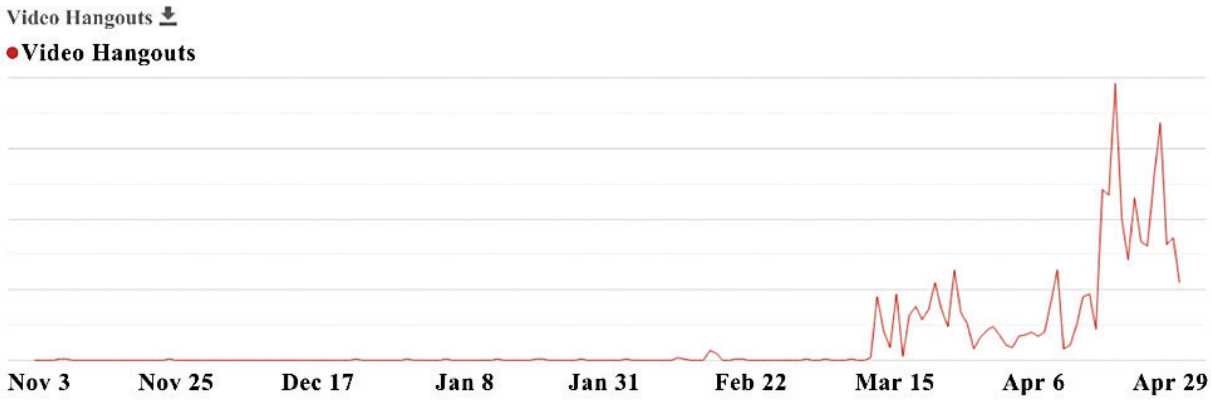

Figure 4. Number of active users for video hangouts from Nov 2019 to Apr 2020

Figure 5 shows that number of devices synced in March and April, for both Android and iOS.

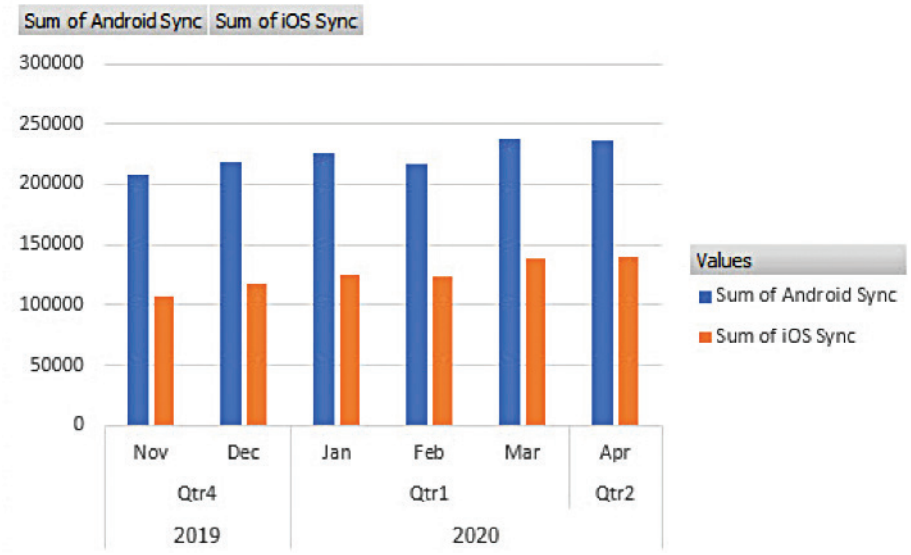

Figure 5. Number of device synced in March and April

Table 3. Number of Android and iOS devices synced

Year	Month	Number of Android device synced	Number of iOS device synced	Sum
2019		427,419	225,246	652,665
	Nov	208,346	106,914	315,260
	Dec	219,073	118,332	337,405
2020		917,395	526,953	1,444,348
	Jan	225,386	124,915	350,301

Table 3. (con't)

Year	Month	Number of Android device synced	Number of iOS device synced	Sum
	Feb	216,555	123,763	340,318
	Mar	238,426	137,714	376,140
	Apr	237,028	140,561	377,589
Grand Total		1,344,814	752,199	2,097,013

Table 3 shows that April 2020 recorded the highest number of iOS devices synced. In addition, the number of both Android and iOS devices synced increased from November 2019 until April 2020.

Table 4. Storage (MB), emails and files added

Values	April	March	Difference	Percent (%)
Drive storage (MB)	13,2692,620	127,672,612	5,020,008	5,020,008
Gmail storage (MB)	1,166,868	1,016,340	150,528	150,528
Photos storage (MB)	2630022	2,359,230	270,792	270,792
Total storage used (MB)	136,489,510	131,048,182	544,1328	544,1328

Table 4 shows the sum of storage (MB) which include drive storage, Gmail storage and photo storage. Between March 2020 and April 2020, the Gmail storage increased by 12.90%, photo storage by 10.29%, and drive storage by 3.78%, respectively. The total storage used increased by 3.98%.

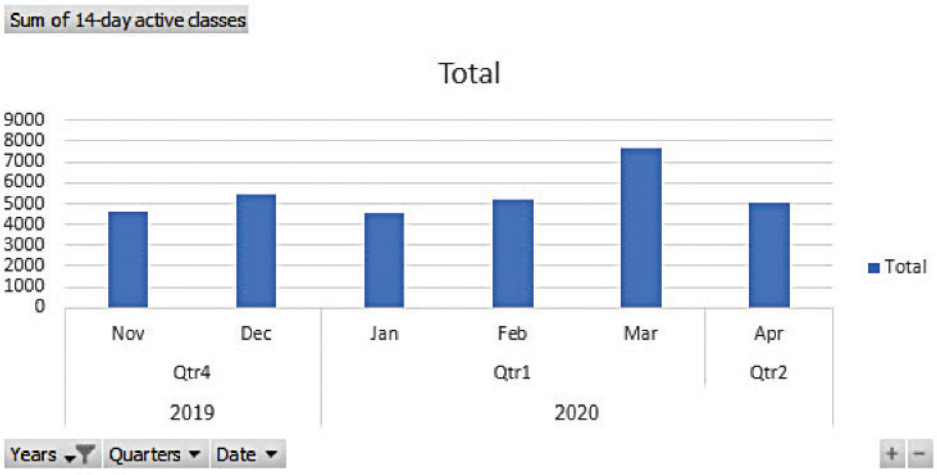

Figure 6. 14-day active classes during November 2019 to April 2020

Figure 6 shows 14-day active classes of the university using Google Classroom. March 2020 recorded the highest active classes in 14 days, 7,636 classes while January 2020 recorded the lowest active classes in 14 days, 4,570 classes.

Table 5. 14-day active classes

Year	Year/Month	Sum of 14-day active classes
2019		10,074
	Nov	4,636
	Dec	5,438
2020		22,426
	Jan	4,570
	Feb	5,211
	Mar	7,636
	Apr	5,009
Grand Total		32,500

Table 5 shows the sum of 14-day active classes in Google Classroom from Nov 2019 till April 2020. The highest number of classed was recorded in March 2020 probably because the final examination was in March and students were required to send in their work and participate in classes.

FINDINGS AND DISCUSSION

The integral part of this research demonstrates the increased use of the Google Applications Platform at Songkhla Rajabhat University. Table 1 shows that the network traffic in the university decreased dramatically as a result of the lockdown. By using Gidden's approach to understanding the social behaviour of the institution faculty, staff, and students, the change in structure is evident for technology use, for the timeframe from November 2019 to April 2020. According to the structuration theory, the change in structure in an institution is the amount of social interaction proportional to time and dependent on location (Giddens, 1984). Thus, the change in the structure during the COVID-19 pandemic in an educational institution could be explained in-depth with the diagram for the dimension of the duality of structure, proposed by Giddens. Three separate routes for the agency's (the university) participants (students, faculty, and staff) to reach the structuration could be distinguished using the diagram. From the data obtained, the dimension that is considered dynamic during the allotted timeframe is the social interaction dimension of communication.

On the other hand, the data shows the varying change in structuration, apparent in the dimension of domination, which is where the allocated resources are distributed and a survival plan is established for the institution during the crisis. While communication between participants increased, the power interaction was relatively constant and definitive. There were two types of power structuration of the agency during the pandemic: the government, and the university's administrators. During the lockdown, the government presented a superior authority over the university management, which dictates a minimal sanction dimension variation. This overrules the normality and normalisation process of all educational institutions in Thailand, which would include the lockdown, the work from home policy, and online learning for students; hence, this normalisation process is inevitable. This proves that organisations are automatically compelled to the normalisation process due to the exertion of the government's power sanction. However, participants

acted swiftly to ensure the continuity of the organisation when the pandemic hit, exercising a new normal and reaching the structuration change of legitimisation during the lockdown.

The second participant of the power dimension is the university administrators. Unlike the government assertion of sanction power, the administrators hold the role of allocating resources and facilities within the agency. The facilities in this case are the available technology of the Google Application platform used by members of the institution, while the existence of the resources and the facility aids the domination of the overall structuration. The increase in the number and usage of applications, storage, file sharing activities, video calls, and IOS and Android device synced supports the ease of the domination structuration. Therefore, a successful structuration process depends on the facilities and allocation of resources with precision and knowledgeable capability, also relative to the timeframe. The communications dimension of interaction is also present in this data collection, especially with the increase in emails and video hangouts. The number of video calls does not solely dictate the number of classes conducted online during the pandemic; however, it is accountable for meetings of staff, faculty, and administrators; similarly, the increase of emails. This increase supports interaction in the dimension of communications, which aids interpretive schemes.

The understanding of the situation becomes more evident to the members of the agency due to an increase in communication: "Participants will act according to their understanding, and hope they can improve their understanding of the current situation after taking some actions" (Kaewkitipong et al., 2016, p. 655). Hence, the structuration of significance is created through this process; the situation and action needed during the crisis becomes vivid. Therefore, the significant dimension affects the maturation of dominance through the cooperation of those adapted to the institution's situation. Singularity relations do not define these straight routes, but duality. The duality of structure means that the structure also influences human interactions. However, these interactions are hard to assume from the data obtained; since these data only show the formation of structuration dependent on human interaction. A case-by-case analysis of each group of participants in the institution can help decipher the impact of structure structuration on the interaction dimension during a crisis. Overall, the results confirmed that structuration occurred within the university through a collective assertion of social interaction between groups of participants during the COVID-19 pandemic. The data matched the structure dimension of domination, where technology is seen as a display of successful structuration. Moreover, the interaction dimension of communications is evident in the data to support the domination structuration process. Through the understanding of these relations, it is proven that technology could be used as a measuring tool to quickly evaluate the institution's structuration process during an ongoing crisis, which might aid the response tactics for the survival of the organisation in the future.

CONCLUSION

The insightful findings of the social behaviour of institutional members at Songkhla Rajabhat University demonstrates a consequential ideology that the existing technology (facilities and resources) in an institute builds the structuration of the organisation during the COVID-19 pandemic crisis. The structuration process helps to understand any societal type of change in the agency during any crisis. In this respect, administrators must make informed decisions and initiate the necessary preparations based on the understanding of these societal changes, especially the integration of technology. The evidence of technology integration and structuration of Songkhla Rajabhat University during the

COVID-19 pandemic matched Anthony Gidden's Model for the Dimension for the Duality of Structure. The integration of technology application has proven that structure in the agency does not have to be defined by physical space, but processes that could be seen online. This case study presented a unique case of ICT being applied to structuration theory during a pandemic. This proves that immense structuration in an institution could happen through societal contribution, entirely in an online setting — defining a New Normal for the society.

Furthermore, the base of this structuration ICT response could be applied to other institutions, and any other scale of society such as a city, a municipality, or even the government sector for a deeper understanding of societal changes and allocation of resources within organisations during a crisis or reforms of organisational structure. This case study could also be implemented on other platforms of society with more interactions between members, such as social media. A crisis response analysed using structuration in both social media and ICT would provide a more superior outcome of understanding social interactions.

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