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ABSTRACT

This study investigates usage behaviour as a variation in internet engagement by integrating the concept of access gaps with the ability-motivation-opportunity (AMO) framework. The research model was tested with data collected from 270 respondents in Klang Valley, which is the most urbanised metropolis in Malaysia. The result of path modelling analysis revealed that the cognitive factor of internet skill has the most significant effect on internet engagement. The significant effects of opportunity and extrinsic motivation on engagement were confirmed. Intrinsic motivation has no significant impact on engagement, but it has a significant interaction effect with opportunity. Thus, the lack of opportunity to access the internet does not limit the frequent engagement of the intrinsically motivated user. This study offers a systematic explanation of the underlying mechanism for the interaction among the access gaps and an alternative model in explaining the determinants of internet user behaviour.

KEYWORDS
Digital Divide, Internet Engagement, Internet Skill, Motivation, Opportunity, Usage Behaviour

1 INTRODUCTION

The internet remains the primary source of information in the new economy. The web offers several advantages, including better job prospect, cheaper communication, cost-efficient travel, seamless financial services, and entertainment. However, not everyone can access and use the internet, thereby creating disproportionate gains (Chauhan et al., 2018; Van Dijk, 2005). Such disparity constitutes the digital divide (van Deursen & van Dijk, 2015b, 2019). The digital divide is beyond the traditional
focus on the distinction between those with access and those without access to investigating how differences in skills and usage shape the digital inequalities (Helsper et al., 2015; Robinson et al., 2015).

Most attempts at explaining the digital divide have been descriptive - associating variation in internet usage with sociodemographic factors (Robinson et al., 2015; van Deursen & van Dijk, 2015a). Contrary to such perspectives, people are not homogenous but are likely to share different needs and interact differently in society. Therefore, some individuals with access to the internet could choose not to use it because of other priorities and needs, which are not necessarily due to lack of means. This reasoning is in line with Selwyn (2006:275), who posited that people are not just ‘end-users with no role to play beyond accepting ready-made technological artefacts.’ Hence, people have the rights to decide on whether to use or not to use a certain technology.

Studies have extended technological access to other types of access gaps including motivational, skills and usage (van Deursen & van Dijk, 2015b; Van Dijk, 2005). Studies have also determined that the access gaps are interdependently related, but the lack of theoretical premises for the interplay among these factors is noticeable. Thus, future studies are needed to offer systematic explanations of the mechanism underlying the interaction among the access gaps (Ghobadi & Ghobadi, 2015). Scholars have also called for the application of alternative models in explaining the attitudinal factors of technology adoption (Bagozzi, 2007; Boateng et al., 2016). Drawing on the ability-motivation-opportunity (AMO) framework, (Ojo et al., 2019) investigated the determinants of internet usage behaviour, but, the situational effect of opportunity was not examined. Accordingly, the present study aims to investigate how users’ perceptions of opportunity could influence the impacts of both ability and motivation on usage behaviours. This study considers opportunity as a situational factor, thereby extending the notion of physical access (Courtois & Verdegem, 2016; Matzat & Sadowski, 2012; Van Deursen et al., 2012) to the favourable conditions like time and other resources to access the internet (Ono & Zavodny, 2008; Siemsen et al., 2008; Venkatesh et al., 2008). Hence, the present study contributes to the digital divide literature, by investigating how individual’s perception of the enabling conditions could affect the cognitive and motivational factors of internet usage.

2 THEORETICAL BACKGROUNDS

The digital divide was initially conceptualised to explain the inequality of access to technological opportunities. This is evident in the gap between individuals with access to and those without access to digital technologies like the computer, internet and other associated systems (van Dijk, 2006; Yu et al., 2018). According to (Pagán et al., 2018), despite the advancement and increasing access to digital technology, there still exist gaps in terms of actual usage among individuals, organisations and countries. The present study focuses on the individual level of the digital divide. Earlier interventions at closing the digital gaps were focused on narrowing the accessibility gap through the reduction of the physical barriers by providing affordable access to those within the underserved community. However, the availability of the low-cost smartphone, prepaid data services and community-based telecentres have enabled more people to gain access to the internet (Chauhan et al., 2018; Naik et al., 2012). Given the increasing accessibility, extant literature has shifted from the notion of physical access to a broader view of the digital divide (Barnidge et al., 2019; Gurstein, 2003; Robinson et al., 2015). As a result, accessibility gaps have been extended beyond the technological perspective to encompass the underlying social, mental, cultural and psychological factors of inequalities in access to and usage of digital technology (Helsper et al., 2015; Van Dijk, 2005).

Moreover, access to the internet does not necessarily result in the effective usage of the internet. Rather individuals with similar access might vary in their capacities to use the internet effectively (Gurstein, 2003). Such a multifaceted perspective of accessibility follows Van Dijk’s (2005) proposition on the four key determinants of effective access to digital technology. According to Van Dijk (2005), internet accessibility can be shaped by the level of the users’ skills and motivation, as well as the presence of favourable conditions and quality of physical access. The concept of internet engagement captures the shift in the digital inclusion literature from the accessibility notion to an encompassing
focus on differences in usage (van Deursen & van Dijk, 2015b). Doing this entails the investigation of how people use and participate in different activities, contents, and platforms on the internet (Helsper & Eynon, 2013). Specifically, we posit that user engages differently with the internet by deciding on whether and how they would use or not use the internet, thereby shaping variations in usage.

Drawing on the AMO framework, engagement with the internet is conceptualised as internally shaped by ability and motivation, while the opportunity is the situational determinant of their engagement. Ability refers to one’s possession of internet skills or proficiency in using the internet and its associated technologies. Inequality of internet skills encompasses the second-level of the digital divide and its significant effect on the effective and efficient use of the internet (Correa, 2016; E. Hargittai & Hsieh, 2012; van Deursen & van Dijk, 2015b). Motivation refers to the underlying motives of an individual’s behaviour. The impact of attitude on technology usage has been well documented (Rauniar et al., 2014; Venkatesh et al., 2008), and the link between attitude and internet usage have been validated (Van Deursen & Van Dijk 2015a). Besides, studies have demonstrated the significance of material access as a determinant for internet usage inequality (Dimaggio et al., 2004; Mossberger et al., 2012). The opportunity in the present study’s context reflects the degree to which one possesses the time and enabling conditions to access the internet (Ono & Zavodny, 2008; Siemsen et al., 2008; Venkatesh et al., 2008). The research model (see Figure 1) also incorporates the effects of the traditional sociodemographic factors of usage inequality (Courtois & Verdegem, 2016; Ojo et al., 2019).

Figure 1. Research model

2.1 Dependent Variable: Internet Engagement

Engagement is conceptually associated with individuals’ involvement, commitment, empowerment and loyalty across the diverse fields of management research (Mollen & Wilson, 2010; Zheng et al., 2015). It is a multifaceted concept, including an individual’s cognitive and affective involvement in a task (Mollen & Wilson, 2010). Engagement with digital technology occurs through individuals’ interaction with the technology to achieve a desirable outcome (Fan et al., 2017). According to Charlton and Birkett (1995), people who interact with technology to a similar extent might produce
different results. The adverse outcome is an addiction, while engagement is a positive outcome. Thus, engagement describes the degree of one’s active involvement with technology for a particular purpose. Based on the analysis of users’ engagement with email, Newhagen et al. (1995) considered human interaction with technology as a psychological construct shaped by an individual’s sense of efficacy and media system’s efficacy. Similarly, studies on the digital divide have demonstrated the relevance of both individual differences and external factors in shaping usage behaviour (Correa, 2015; Van Deursen and Van Dijk, 2015a). For instance, people differ in their motivation and skills, thereby demonstrating different levels of attitude and competence. Besides, the external factor of physical access to the internet could impact on their usage. In line with the above, the hypothesised relationships between these determinants and internet engagement are discussed as follows.

2.2 Internet Skill and Internet Engagement

Ability reflects the ‘set of skills that users need to operate computers and their networks, to search and select information, and the ability to use them for the fulfillment of one’s goals’ (Van Dijk 2005;73). According to Hargittai (2005), internet skill encompasses an individual’s ability to effectively and efficiently find useful information on the internet. The internet self-efficacy evaluates the extent to which people are confident in their ability to organise and perform certain activities on the internet (Eastin and LaRose, 2000). Other studies have examined skills as self-perceived abilities that significantly impact internet engagement (LaRose & Eastin, 2004; Livingstone & Helsper, 2007; Ojo & Raman, 2017). An individual will engage in a behaviour that she/he feels confident of performing. Nevertheless, scholars have questioned the self-reported measure of skills for its lack of validity (Van Deursen & Van Dijk 2015b). Accordingly, survey items have been developed from the outcome of performance-based tests focused on assessing individuals’ internet skills (Hargittai, 2005; Van Deursen et al., 2012). Hargittai (2005) for example, evaluated users’ awareness of internet terms (e.g., advanced search, jpg, pdf, spyware). These items highly correlated with individuals’ ability to find different content on the web, thereby they were employed as proxies for internet users’ actual skills. As compared with the self-assessment measure, the performance-based scale has demonstrated superior psychometric properties regarding satisfactory reliability and construct validity (Van Deursen & Van Dijk 2015b; Correa 2015; Hargittai & Hsieh 2012).

Consequently, we suggest the following hypothesis to describe the relationship between internet skills and usage.

H1: User with adequate internet skills will frequently engage with the internet for diverse purposes.

2.3 Motivation and Internet Engagement

An intrinsically motivated individual performs an activity because it is inherently interesting and enjoyable, but not for other tangible outcomes (Davis et al., 1992). Intrinsic motivation entails the self-desire to find new things and new challenges, to assess one’s potential, observe and gain knowledge. It is influenced by an interest or enjoyment in the task itself and exists within the individual rather than depending on external pressures or a desire for reward. In any activity, intrinsic motivation encourages satisfying and attractive behaviour, which result in pleasure and internal fulfilment for the performer of the action (Fischer et al., 2019). However, extrinsic motivation entails the performance of an activity to achieve desirable results, which are separate from the action itself. Therefore, extrinsic motivation is instrumental in attaining rewards (Koh & Saad, 2006). The IS literature has generally conceptualised intrinsic and extrinsic motivation as perceived enjoyment (PE) and perceived usefulness (PU), respectively (Davis, 1989). Several studies within the workplace domain, have found PU to be the most significant determinant of technology usage (Wu & Lu, 2013). Besides earlier findings on internet usage behaviour supported the instrumental values, wherein people mainly use the internet for its relevance to their daily tasks (Teo et al., 1999). Nevertheless, the hedonic value
of PE showed a dominant effect on usage within the voluntary context. Studies on online learning behaviour found that students who were intrinsically motivated engaged more in the completion of the assigned assignment (Martens et al., 2004) and participated in the discussion (Rienties et al., 2009), as compared to those who were extrinsically motivated.

Both the instrumental and hedonic needs can influence one’s usage of the internet. For example, users could engage with the internet to achieve economic objectives, including buying and selling products, searching for a job or relevant information, all of which are instrumental values. Therefore, studies have associated the significant impact of PU with the instrumental value of the technology in task performance (Koh & Saad, 2006; Teo et al., 1999). Nevertheless, engagement is likely to be motivated by the hedonic value, when individuals use the internet for leisure and entertainment purposes. Studies investigating usage behaviour within the voluntary context have reported a significant impact of PE (Hsu & Lin, 2008; Lin et al., 2017; Rienties et al., 2009). According to Hsu and Lin (2008) engagement with the internet for social activities like blogging has more to do with interest; because individuals will only contribute to blogging when they perceive it as enjoyable.

Furthermore, the outcome of a recent meta-analysis reported that the impact of both extrinsic and intrinsic motivation is dependent on the context of technology usage (Wu & Lu, 2013). According to them, both components of motivation are salient in the context of behavioural intention. Extrinsic motivation is more significant when using technology for the utilitarian purpose, but intrinsic motivation becomes dominant for the hedonic purpose. Nevertheless, both can influence a user’s behaviour when a hedonic system is expected to offer a utilitarian purpose. The present study examines internet usage behaviour as engagement in diverse activities, contents, and platforms. Therefore, we hypothesise that both the hedonic and utilitarian values are significant in explaining engagement.

H2: Intrinsically motivated user will frequently engage with the internet for diverse purposes.
H3: Extrinsically motivated user will frequently engage with the internet for diverse purposes.

2.4 Moderating Effects of Opportunity on Internet Engagement

Opportunity examines the extent to which an individual possesses the time or favourable conditions to enable the performance of a certain behaviour (MacInnis & Jaworski, 1989). An individual lacks the opportunity when he or she has the will to perform a behaviour but unable to do so, due to conditions outside of his or her control (Rothschild, 1999). In the context of employee’s knowledge sharing behaviour, the opportunity was operationalised as the availability of time (Siemsen et al., 2008). While in IS literature, it has been conceptually linked to facilitating conditions or perceived behaviour control (Venkatesh et al., 2003). Facilitating conditions is defined as the ‘degree to which an individual believes that an organisational and technical infrastructure exists to support the use of the system’ (Venkatesh et al. 2003:453). Based on the perspective of effort expectancy, facilitating conditions can internally shape an individual’s behavioural intention. While the external effect of facilitating conditions relate to the presence of the essential resources that can support the performance of a particular behaviour (Venkatesh et al., 2008). Previous studies have investigated such conditions in the form of the formal training, guidance, infrastructure and help-desk support that are provided for the employees to facilitate their usage of the technology (Venkatesh et al., 2008). Regarding internet engagement, opportunity can be considered from a positive perspective as the availability of the enabling conditions and time to access the internet.

Opportunity encapsulates the conditions that are outside of one’s control, which could constrain the ability and motivation to perform a behaviour. Thus, the availability of the favourable conditions to support internet usage does not only directly impact on usage but serves as the situational determinants of how one’s competence and motive relate to usage (Ojo & Raman, 2016). In the context of employee’s engagement in knowledge sharing, the opportunity has been revealed to function as a bottleneck, which can either facilitate or inhibit knowledge sharing (Siemsen et al., 2008). Equally, usage behaviour
has been found to be contingent on the extent to which the underlying conditions are favourable to enable system use (Venkatesh et al., 2008). For instance, people who are both willing and possess the essential internet skills will engage more frequently with the internet, when the conditions are favourable. Likewise, the unwilling and the less competent user might be encouraged to engage with the internet frequently, when the conditions are favourable. The favourable conditions include the availability of time, reliable access, resources and support (Ono & Zavodny, 2008; Siemsen et al., 2008; Venkatesh et al., 2008).

Opportunity concerning the availability of time, human and technological resources could facilitate the frequent engagement of individual’s who ordinarily lack the essential skills to do so. Furthermore, when everyone around is using the internet, an unwilling individual’s might be encouraged to engage with the internet to stay in touch with friends and gain group’s acceptability. Therefore, access to people who are frequent users of the internet might facilitate an unwilling individual interest in engaging with the internet for a various purpose. Courtois and Verdegem (2016) revealed that the support of frequent internet users is relevant to explaining the usage behaviour of individuals with low skills and motivation. In line with this, the following hypotheses suggest that the impacts which digital skill, intrinsic and extrinsic motivation have on internet engagement are contingent on the opportunity to access and use the internet.

H4: The impact of (a) internet skills; (b) intrinsic motivation, and (c) extrinsic motivation on internet engagement is stronger for individual’s that have the opportunity to access and use the internet compared to one with limited opportunity.

2.5 Socioeconomic Determinants of Internet Engagement

The proliferation of digital technology in everyday activities has resulted in deepening inequality between more connected individuals and those with limited access to the internet (Courtois & Verdegem 2016). Several sociodemographic factors, including gender, age, educational attainment and income, have been considered as the key predictors of usage inequalities (Robinson et al., 2015). Although accessibility gaps between the male and female have narrowed, there still exists some level of inequality in terms of usage between the male and female (Blank & Groselj, 2014). As compared to women, men have been found to engage more with the internet for diverse activities (Correa, 2015). Individual’s usage diversity has also been closely associated with age (Chen & Wellman, 2004; Robinson et al., 2015; van Deursen & van Dijk, 2015b). Younger people are exposed to the internet from the early years and are generally familiar with the internet. Thus, they are more likely to engage with the internet for diverse purposes (Correa 2015).

Another significant predictor of internet usage behaviour is educational attainment (Dimaggio et al., 2004; van Deursen & van Dijk, 2015a). The poor economic status of people with low educational attainment correlates with the lack of physical access to the internet. Besides, lack of access is associated with the low level of digital skills and usage of the internet for a non-beneficial purpose (E. Hargittai & Hsieh, 2012). On the other hand, high educational attainment correlates with high socioeconomic status, awareness and enhanced information processing capability. Moreover, an increase in household income correlates with higher usage because such individuals can afford to pay for internet access (Livingstone & Helsper, 2007; Ono & Zavodny, 2008; Van Dijk, 2005). Studies have revealed that individuals with higher income use the internet more frequently for economic purposes, while those with a lower level of income engage with the internet for entertainment and generic activities ((Dimaggio et al., 2004). Besides, internet experience has been determined to be strongly associated with usage behaviour (Eastin & LaRose, 2000; E. Hargittai & Hinnant, 2008; Livingstone & Helsper, 2007). Therefore, an individual who has accumulated some level of experience in using the internet is expected to possess good digital skills, thereby able to use the internet in performing diverse activities (Van Deursen & Van Dijk 2015a).
Given the above, we propose the following hypotheses:

H5: Age is negatively related to frequent engagement with the internet.
H6: Educational attainment is positively related to frequent engagement with the internet.
H7: Male are more likely to engage frequently with the internet.
H8: Income is positively related to frequent engagement with the internet.
H9: Internet experience is positively related to frequent engagement with the internet.

3. METHODOLOGY

3.1. Data Collection

This study collected data from a sample of 270 respondents across Klang Valley, a metropolis comprising of the capital city, Kuala Lumpur and the state of Selangor in Malaysia. Klang Valley is the most populous, urbanised and diverse region. Moreover, its broadband internet penetration rate of 87% for the household is far greater than the national rate of 77.9% (MCMC, 2017). Nevertheless, due to several reasons such as lack of confidence, interest, time and financial capability, about a quarter of the population are non-internet users (MCMC, 2017). Therefore, the phenomenon of the digital divide is expected to be more evident in this context.

Before the final collection of data, we pre-tested the initial questionnaires to enhance the clarity, appropriateness and relevance of the questions. The pre-test was conducted by randomly administering the questionnaires to 35 respondents. These respondents were asked to review and comment on the phrasing of the questionnaires. Based on their comments, the questionnaire was revised. The final survey was administered by two graduate students, serving as research assistants. The intercept technique was adopted in the collection of data by randomly distributing the questionnaires to individuals at public spaces like shopping malls and train stations around the Klang Valley. Past studies have described the intercept technique as one of the most appropriate methods. This is due to its ease of implementation and lower refusal rate, most especially, when the respondents are drawn from varied backgrounds (Boateng et al., 2016; Puspitasari & Ishii, 2016).

Two hundred and seventy questionnaires were completed and returned, out of a total of 350 administered questionnaires. The average age of the respondents was 33.5 years ($SD = 9.35$), ranging from 20 to 59 years, while the mean number of years of Internet experience was 10.16 ($SD = 4.0$). Table 1 summarises the respondents’ demographic profile.

3.2. Measurement

The measurement scales for the variables were adapted from the literature. Except for the sociodemographic determinants (i.e., gender, age, education, income, internet experience), the other independent variables were measured using the 5-point Likert scale ranging from “strongly disagree (1)” to “strongly agree (5)”. While the dependent variable, internet engagement was measured with a 5-point Likert scale ranging from 1 (never) to daily (5).

Intrinsic motivation was measured using seven items that were adapted from the original scale of perceived enjoyment (Davis et al., 1992). This construct reflects the degree to which an individual believes that using the internet is enjoyable on its own, irrespective of the other outcomes. The mean, standard deviation and Cronbach Alpha are 3.921, 0.779, and 0.882, respectively. The extrinsic motivation was measured with four items adapted from the perceived usefulness scale (Davis et al., 1992; Venkatesh et al., 2003). This scale captures the extent to which an individual believes that using the internet is instrumental in achieving desired outcomes that are separate from the user’s experience. The mean, standard deviation and Cronbach Alpha are 3.601, 0.785, and 0.749, respectively.

The opportunity was measured by asking the respondents the degree to which the lack of time, reliable access and other enabling conditions have constrained their usage of the internet (Ono &
Zavodny, 2008; Siemsen et al., 2008; Venkatesh et al., 2008). These items were reversed coded during data entry to reflect the positive view of opportunity as favourable conditions. The mean, standard deviation and Cronbach Alpha are 3.858, 0.849, and 0.726, respectively.

Internet skill was operationalised using nine items that assessed the respondent’s perception of the extent to which they possess the basic skills for using the internet (E. Hargittai & Hsieh, 2012). Thus, the respondents were asked about their level of awareness and capability to perform tasks related to using the internet. Some of the sample items include navigating a website, searching for information, attaching a file to an email and downloading a file (Ojo et al., 2019). Previous studies have validated the internal consistency and predictive value of this scale (Correa, 2016; E. Hargittai & Hsieh, 2012; Matzat & Sadowski, 2012; Ojo et al., 2019). The mean, standard deviation and Cronbach Alpha are 3.711, 0.684, and 0.799, respectively.

Internet engagement was adapted from Van Deursen and Van Dijk (2015b), 25 items based on the five-point Likert scale, ranging from 1 (never) to daily (5). The respondents were asked the extent to which they use the internet in performing diverse activities. Sample items include searching for information, entertainment, learning, social engagement, etc (Ojo et al., 2019). The mean, standard deviation and Cronbach Alpha for the average sum of the 25 items scale were 3.15, 0.67 and 0.82, respectively.

Gender was assessed as a dichotomous variable (Male = 1, Female = 0). Age was measured using the numeric value reported by the respondents. Following previous studies (Helsper & Eynon, 2013; van Deursen & van Dijk, 2015b) educational attainment was categorised into three – low (secondary level and below), medium (diploma level), high (degree / postgraduate level). Income was computed as the total family income in the last 12 months. The number of years that respondents had been using the internet was included as the measurement of internet experience.

### Table 1. Demographic profile

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>109</td>
<td>40.4</td>
</tr>
<tr>
<td>Female</td>
<td>161</td>
<td>59.6</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>81</td>
<td>30.0</td>
</tr>
<tr>
<td>Medium</td>
<td>80</td>
<td>29.6</td>
</tr>
<tr>
<td>High</td>
<td>109</td>
<td>40.4</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 – 29</td>
<td>114</td>
<td>42.2</td>
</tr>
<tr>
<td>30 – 39</td>
<td>90</td>
<td>33.3</td>
</tr>
<tr>
<td>40 – 49</td>
<td>51</td>
<td>18.9</td>
</tr>
<tr>
<td>50 Above</td>
<td>15</td>
<td>5.6</td>
</tr>
<tr>
<td>Income (Annual)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RM49,999</td>
<td>80</td>
<td>29.6</td>
</tr>
<tr>
<td>RM50,000 – RM74,599</td>
<td>139</td>
<td>51.5</td>
</tr>
<tr>
<td>Above RM75,000</td>
<td>51</td>
<td>18.9</td>
</tr>
</tbody>
</table>
4. RESULTS

4.1 Assessment of Measurement Models

The partial least squares (PLS) method was used for the analyses of the measurement and structural models. This is a variance-based structural equation modelling (SEM) technique that is applicable in assessing the predictability of the exogenous variables. Unlike the covariance-based SEM, the PLS is highly robust and less affected by model misspecification (Hair et al., 2017). Hence, we used the SmartPLS 3.0 to validate our model and test the research hypotheses. The convergent validity for the latent variables was evaluated based on the generated factors loadings, average variance extracted (AVE), and composite reliability (CR). As presented in Table 2, the factors loading for all the items ranging from 0.510 to 0.859, were above the recommended value of 0.5 (Hair et al., 2017).

Table 2. Results of Measurement Model

<table>
<thead>
<tr>
<th>Variables</th>
<th>Items</th>
<th>Factor Loading</th>
<th>AVE</th>
<th>CR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet Skills (IS)</td>
<td>DS1</td>
<td>0.656</td>
<td>0.515</td>
<td>0.863</td>
</tr>
<tr>
<td></td>
<td>DS2</td>
<td>0.760</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>DS3</td>
<td>0.595</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>DS5</td>
<td>0.854</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DS7</td>
<td>0.722</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DS8</td>
<td>0.691</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intrinsic Motivation (IM)</td>
<td>IM1</td>
<td>0.633</td>
<td>0.543</td>
<td>0.892</td>
</tr>
<tr>
<td></td>
<td>IM2</td>
<td>0.756</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>IM3</td>
<td>0.725</td>
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<td></td>
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<tr>
<td></td>
<td>IM4</td>
<td>0.649</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>IM5</td>
<td>0.739</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>IM6</td>
<td>0.840</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IM7</td>
<td>0.792</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extrinsic Motivation (EM)</td>
<td>EM1</td>
<td>0.578</td>
<td>0.516</td>
<td>0.806</td>
</tr>
<tr>
<td></td>
<td>EM2</td>
<td>0.823</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EM3</td>
<td>0.825</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EM4</td>
<td>0.611</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opportunity (OP)</td>
<td>OP1</td>
<td>0.510</td>
<td>0.516</td>
<td>0.803</td>
</tr>
<tr>
<td></td>
<td>OP2</td>
<td>0.837</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OP3</td>
<td>0.606</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OP4</td>
<td>0.859</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internet Engagement (IE)</td>
<td>IE</td>
<td>SIM</td>
<td>SIM</td>
<td>SIM</td>
</tr>
</tbody>
</table>

Note: SIM = single item measures, AVE = average variance extracted, CR = composite reliability.

We obtained a satisfactory range of values in Table 2 after deleting three items with low factor loadings from the internet skill scale (i.e., IS4, IS6, and IS9). The AVE values ranging from 0.515 to 0.543, were greater than the minimum value of 0.50, and the composite reliability values ranging
from 0.803 to 0.892 were greater than the cut-off point 0.70. Therefore, the conditions for convergent validity were satisfied (Hair et al., 2017). Furthermore, we examined the discriminant validity for the latent variables based on the Fornell-Larcker’s criterion, and the results are summarized in Table 3. The results presented in Table 3 have satisfied the conditions for discriminant validity. Specifically, the off-diagonal elements, which represent the correlations between pairs of latent variables are of lesser magnitude than the square root of the corresponding AVEs, which are presented as the diagonal elements (Fornell & Larcker, 1981; Henseler et al., 2009).

4.2 Assessment of Structural Model

Table 3. Discriminant Validity

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Internet Skill</td>
<td>-0.108</td>
<td>0.657</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Internet Engagement</td>
<td>0.021</td>
<td>0.322</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Extrinsic Motivation</td>
<td>-0.090</td>
<td>0.170</td>
<td>0.199</td>
<td>0.718</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Education</td>
<td>0.269</td>
<td>-0.060</td>
<td>0.112</td>
<td>-0.047</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Opportunity</td>
<td>0.035</td>
<td>-0.101</td>
<td>0.211</td>
<td>-0.035</td>
<td>-0.005</td>
<td>0.719</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Gender</td>
<td>-0.009</td>
<td>-0.034</td>
<td>0.120</td>
<td>0.015</td>
<td>-0.115</td>
<td>-0.059</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Intrinsic Motivation</td>
<td>-0.144</td>
<td>0.352</td>
<td>0.112</td>
<td>0.462</td>
<td>0.023</td>
<td>-0.226</td>
<td>0.027</td>
<td>0.737</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Income</td>
<td>0.116</td>
<td>-0.033</td>
<td>0.154</td>
<td>-0.036</td>
<td>0.285</td>
<td>0.052</td>
<td>0.036</td>
<td>0.041</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>10. Internet Experience</td>
<td>0.114</td>
<td>0.048</td>
<td>0.084</td>
<td>-0.009</td>
<td>-0.102</td>
<td>-0.052</td>
<td>0.062</td>
<td>-0.034</td>
<td>0.002</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Note: diagonals (in bold) represent the squared root of average variance extracted (AVE) while the other entries represent the correlations.

The hypothesised relationships were evaluated based on the validated structural model. Following Hair et al. (2017) we examined the path coefficient, level of significance and coefficient of determination ($R^2$) for each of the hypothesis. The statistical significance of the path coefficients was assessed based on the bootstrap analysis, with a resampling size of 1000. The hypothesised path from internet skill to internet engagement was significant ($\beta = 0.354$, $p<0.001$). Similarly, extrinsic motivation was significantly associated with internet engagement ($\beta = 0.192$, $p<0.05$). However, intrinsic motivation was not a significant predictor of internet engagement ($\beta = -0.087$, $p>0.05$). Our results revealed that opportunity is a significant moderator of the relationship between extrinsic motivation and internet engagement ($\beta = 0.235$, $p<0.001$). This indicates that extrinsic motivation is strongly associated with internet engagement when the enabling conditions are favourable. Also, we found that opportunity tends to interact with intrinsic motivation in affecting internet engagement ($\beta = -0.111$, $p<0.1$). This suggests that intrinsically motivated internet users are not likely to be constrained by the lack of opportunity to access the internet. However, the moderating effect of opportunity on the relationship between internet skill and internet engagement was not supported. Accordingly, H1, H3, H4b and H4c were supported, but H2 and H4a were not supported. Moreover, except for age, all the other sociodemographic determinants (i.e., education, gender, income, and internet experience) were significant predictors of internet engagement. The results of hypotheses testing were summarised in Table 4.

The $R^2$ value of 0.301 for internet engagement indicates that digital skill, motivation, opportunity and sociodemographic can explain 30.1% of the variance in internet engagement. Furthermore, the
statistical significance of the path coefficients was assessed based on the bootstrap analysis, with a resampling size of 1000.

4.3 Predictive Relevance (Q²)

Following (Henseler et al., 2009) the model’s predicting capability was evaluated using the predictive sample reuse technique (i.e., Stone-Geisser’s Q²). This analysis was computed with the aid of the blindfolding procedure. According to Hair et al. (2017), the predictive relevance of the exogenous construct on the endogenous construct becomes acceptable when the Q² value is greater than zero. The Q² of internet engagement was 0.271, which indicates that the research model has satisfactory predictive relevance.

<table>
<thead>
<tr>
<th>H</th>
<th>Relationships</th>
<th>Beta</th>
<th>SE</th>
<th>t-value</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>Internet skills Internet Engagement</td>
<td>0.354</td>
<td>0.062</td>
<td>5.731**</td>
<td>Supported</td>
</tr>
<tr>
<td>H2</td>
<td>Intrinsic motivation Internet Engagement</td>
<td>-0.087</td>
<td>0.075</td>
<td>1.153</td>
<td>Not Supported</td>
</tr>
<tr>
<td>H3</td>
<td>Extrinsic motivation Internet Engagement</td>
<td>0.192</td>
<td>0.068</td>
<td>2.813*</td>
<td>Supported</td>
</tr>
<tr>
<td>H4a</td>
<td>Internet skills X Opportunity Internet Engagement</td>
<td>0.057</td>
<td>0.071</td>
<td>0.812</td>
<td>Not Supported</td>
</tr>
<tr>
<td>H4b</td>
<td>Int. Motivation X Opportunity Internet Engagement</td>
<td>-0.111</td>
<td>0.085</td>
<td>1.300</td>
<td>Supported</td>
</tr>
<tr>
<td>H4c</td>
<td>Ext. motivation X Opportunity Internet Engagement</td>
<td>0.235</td>
<td>0.074</td>
<td>3.163**</td>
<td>Supported</td>
</tr>
<tr>
<td>H5</td>
<td>Age Internet Engagement</td>
<td>-0.038</td>
<td>0.054</td>
<td>0.708</td>
<td>Not Supported</td>
</tr>
<tr>
<td>H6</td>
<td>Education Internet Engagement</td>
<td>0.142</td>
<td>0.058</td>
<td>2.462*</td>
<td>Supported</td>
</tr>
<tr>
<td>H7</td>
<td>Gender Internet Engagement</td>
<td>0.113</td>
<td>0.054</td>
<td>2.091*</td>
<td>Supported</td>
</tr>
<tr>
<td>H8</td>
<td>Income Internet Engagement</td>
<td>0.113</td>
<td>0.054</td>
<td>2.106*</td>
<td>Supported</td>
</tr>
<tr>
<td>H9</td>
<td>Internet Experience Internet Engagement</td>
<td>0.109</td>
<td>0.051</td>
<td>2.153*</td>
<td>Supported</td>
</tr>
</tbody>
</table>

*p < 0.10; *p ≤ 0.05; **p ≤ 0.001

5. DISCUSSION AND CONCLUSION

This study investigated the determinants of internet engagement for a diverse sample of the Malaysian population. Although, the overall household broadband penetration rate in Malaysia is 77.9%; however, the context of the current study, the Klang Valley area has a penetration rate of 87% (MCMC, 2017). Such an appreciable rate presents an appropriate context for investigating variation in internet engagement in an emerging country. The increasing accessibility to the internet has facilitated the shift from the binary notion of physical access to the interplay among the underlying access gaps in attitude, skills, and usage. Although previous studies have investigated the multivariate determinants of digital inequality, the lack of adequate theoretical background for the relationships among these factors is noticeable. Future studies are therefore encouraged to offer a systematic explanation of the mechanism underlying the interaction among these gaps (Ghobadi & Ghobadi, 2015; van Deursen & van Dijk, 2015b). Accordingly, the present manuscript demonstrates the empirical relevance of AMO framework as a theoretical foundation for relating differences in skills, motivation, opportunity, and usage. Specifically, this study investigated the usage gap as variation in internet engagement by integrating Van Dijk’s (2005) perspective on access gaps with the AMO framework.
As hypothesised, internet skill was the most significant predictor of internet engagement, followed by extrinsic motivation. However, the effect of intrinsic motivation on internet engagement was not supported. These results are consistent with the literature on the significance of skills, and attitudinal access gaps in the appropriation of digital technology like the internet (Van Deursen & Van Dijk 2015a; Ghobadi & Ghobadi 2015). Besides, these findings extend the attitudinal factor from the emotional notion to the underlying motive for engagement with the internet (Reisdorf & Groselj, 2017). The non-significant effect of intrinsic motivation suggests that hedonic values do not drive users’ internet engagement. Thus, it concurs with previous studies which found that internet usage behaviour is less associated with intrinsic motivation but strongly associated with extrinsic motivation (Teo et al., 1999).

The instrumental need is a key determinant of usage behaviour, yet, the outcome of a meta-analysis by Cameron and Pierce (1994) found that this need does not undermine intrinsic motivation. However, Deci et al. (1999) meta-analysis revealed that the instrumental values could mask the effect of intrinsic motivation. Following the inconclusive findings, Deci et al. (2001) delineated the effect of instrumental values as informational and controlling components. The informational component reflects the self-determined competence, which is associated with intrinsic motivation while the controlling component impacts the externally perceived locus of causality, which minimises intrinsic motivation. The controlling component is evident in the current study, where engagement includes the extensive usage of internet in diverse activities. Therefore, the hedonic effect of the internet might be masked by the instrumental values. People are more likely to relate their usage of the internet with the attainment of external rewards like performance, interaction with friends or group acceptance. Whereas, the hedonic nature of the internet offers a self-fulfilling value, which is more dominant in entertainment activities (Atkinson & Kydd, 1997; Heijden, 2004). Our results align with findings on internet use and gratification; which suggest that the internet’s potential to improve one’s lot in life is the most powerful motivating factor for usage (LaRose & Eastin, 2004).

Most prominent though is the findings on the moderating effects, which underscore how the instrumental and hedonic values interact with opportunity. As hypothesised internet engagement deepened for the extrinsically motivated individuals, who have the opportunity to access and use the internet. However, the interaction between intrinsic motivation and opportunity had a negative impact on internet engagement. This result indicates that when individuals derive fun and enjoyment from the internet, they will find a way to go around the limitation imposed on their usage. With the increasing physical access to the internet, interventions focused on creating the opportunity for intense engagement might be effective in facilitating usage for practical purposes, yet such is not broad enough to explain the complexity of digital divide (Ghobadi & Ghobadi, 2015). For instance, the underlying motive for an individual’s usage, most especially the needs for enjoyable and leisure activities could rectify the limitations imposed by the lack of opportunity. Therefore, users who have developed the habit of using the internet might not engage less frequently with the internet when they have limited opportunity to do so.

Moreover, consistent with findings from the developed countries, inequalities in internet usage in Malaysia can be associated with the sociodemographic factors (Büchi et al., 2015). This study confirmed that men and more educated higher-income earners and experienced internet users engage more with the internet. Nonetheless, the lack of support for the negative effect of age on internet engagement is unexpected. Younger internet users have grown up with a higher level of familiarity with digital technology, thereby deepening generational gaps in usage (Büchi et al., 2015; Correa, 2016). However, our result debunks such notion, thus demonstrating that usage inequality is not directly associated with age.

In conclusion, the present study contributes to the information science literature by synthesising the AMO’s framework with the multifaceted perspective of access gaps in the digital divide literature. Hence, our findings offer some insights into the factors of the digital divide by demonstrating the situational determinants of internet engagement.

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REFERENCES


Correa, T. (2016). Digital skills and social media use: How Internet skills are related to different types of Facebook use among ‘digital natives.’. *Information Communication and Society, 19*(8), 1095–1107. doi:10.1080/1369118X.2015.1084023


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