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## Attitude towards Information & Communication Technology (ICT) and Digital Divide: What Academicians Say?

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### Abstract

Major structural changes have occurred in the global socioeconomic environment, and a large portion of these changes can be attributed to the transformational power of information and communication technologies (ICT). It is generally accepted that having access to ICT will lead to social development and economic growth. However, the digital revolution does not offer the same opportunities for every individual equally. The digital divide (the gap between demographics and geographic areas with and without access to modern ICT) poses a threat to the outcome. The Covid-19 outbreak has also played a significant role in bringing the issue to the forefront. The analysis of this topic contributes to a better understanding of the issue and will aid those working to close the gap. Thus, this study aimed to revalidate the scale of attitude toward ICT and the impact on the digital divide, and get expert consensus and views for this scale. This study uses the Fuzzy Delphi method with a 7-Likert scale to gather responses from 7 experts in higher learning institutions in Malaysia. A total of 4 key constructs and 20 sub-elements or items of questionnaires were given to experts for evaluation. The Fuzzy Delphi method Logic Software (FUDELO) has been used for data analysis. Triangular fuzzy numbering (triangular fuzzy number) was used to examine the data, and the "defuzzification" process was used to determine each item's ranking. The results show that the level of response and expert agreement on the scale is good. The overall expert consensus score is higher than 75% and the overall threshold (d) value is  $< 0.2$ . The results from the defuzzification process show that all items reach consensus and are valid through the expert judgment process. Therefore, the items that have been validated meet the required criteria. This will allow future research on the digital divide to use attitudes towards ICT as factors (determinants) of the digital divide in Malaysia.

**Keywords:** Attitude, Digital Divide, ICT, Expert Consensus, Fuzzy Delphi Method

### Introduction

The digital divide is a significant issue in the modern world. The more advance the country, the higher the reliance of its people on Information and Communication Technology (ICT) to interact or to do any activity in all aspects of life. Any disparities in ICT access, usage, and outcome could be defined as the digital divide (Lythreath et al., 2022). To put it simply, the

digital divide means the gap between people who have good access to ICT and people who have limited or no access to ICT. There are many factors that could lead to the digital divide. These factors are divided into a few categories such as sociodemographic, socioeconomic, personal elements, social support, type of technology, digital training, rights, infrastructure, and large-scale events as well as attitude (Lythreatis et al., 2022, Aswathi & Haneefa, 2020). Digital divide could create inequality in society because it can either restrict or improve people's social and economic capital including their participation in society such as in education, social interaction, economic activity, etc. (Ragnedda, 2017). In the context of education, the digital divide has caused unequal access to information and education opportunities.

Ever since the Covid-19 pandemic struck most parts of the world, Malaysia like most other countries is forced to transform the way they run their country into a "new norm", especially in the context of education. This Covid-19 pandemic shows the importance of bridging the digital divide in education because schools were closed and only online learning was allowed during that time (Mohammad et al., 2021). Understanding the causes of the digital divide is necessary for policymakers who want to close it. In general, factors such as sociodemographic, socioeconomic, personal elements, social support, type of technology, digital training, rights, infrastructure, and large-scale events as well as attitude contribute to the digital divide (Lythreatis et al., 2022, Aswathi & Haneefa, 2020). However, most studies primarily focus on deficiency in infrastructure as the main factor of the digital divide. There are only a few studies that see attitude towards ICT may cause to digital divide. In the Malaysian context, most studies on digital divide focuses on initiatives to bridge digital divide such as reducing cost of ICT access, expanding community access centers, building awareness and reducing language and cultural barrier (Foo et al., 2017), while the other focuses on issues of ICT access and use among rural and urban youth during Covid-19 pandemic (Mohammad et al., 2021). Thus, an attempt is made to see how such measurements (attitude) are valid in Malaysia where this study is a something new. In other words, before researchers can apply attitude as a measurement, it is important to obtain expert agreement on the measurement of attitude towards ICT and its impact on the digital divide in Malaysia using the Fuzzy Delphi Method.

Obtaining expert agreement on the measurement of attitude towards ICT and its impact on the digital divide will simply allow researchers to use these measurements in Malaysia. To put it simply, failing to agree with these measurements simply means researchers cannot use them in Malaysia. Hence, such failure might reduce the explanatory power of these measurements in explaining the causes of the digital divide. Even worse, someone might misunderstand that the digital divide is solely caused by a deficiency in infrastructure only. Moving forward, the digital divide in the context of education itself has caused many problems such as unequal access to information, etc.

### **Review of Literature**

The issue of the digital divide has been under investigation since the mid-1990s. It remains a significant problem in Malaysia and elsewhere, affecting especially rural areas and low-income groups. With the rapid shift to digitalization following the Covid-19 outbreak, the issue has become much more serious. In Malaysia, businesses and organizations, including the education sector, have begun integrating digital technologies more deeply into their daily operations to produce effective and efficient activities. It has been noted and stated that there are a variety of issues and challenges with the use of digital technologies in

communities, particularly in rural areas and among low-income households, which contribute to the issue of the digital divide.

In the Malaysian context, there are studies on digital divide that have been conducted from various aspects. There are researchers who study digital divide problems by focusing on rural areas (Nair et al., 2010; Surianshah 2021; Esa et al., 2021; Darus et al., 2021; Tokiran et al., 2021). Nair et al (2010) looked at important socioeconomic variables that affect computer use in Malaysian rural farming and fishing communities. They discovered that the primary barriers to computer use in the locations were perceived as being the high cost of computers, limited computer knowledge, and a lack of relevance and interest. Surianshah (2021) measured students' outcomes based on their perspectives on the effectiveness of online classes and financial constraints to attend classes. The researcher used a sample of secondary school students in the rural area of Sabah, Malaysia, and proved the existence of the digital divide among students during the Covid-19 pandemic. According to a study by Esa et al (2021), the learning method and internet connection were the two key elements affecting secondary students' ability to participate in online education in Sabah. A study conducted by Darus et al (2021) found only 2 spots with good internet coverage in Tuba Island, Langkawi, and the majority of the population has an average competent level of knowledge and skills to use the internet application.

Some scholars examine digital divide issues in terms of the factors that contribute to them. The lack of ICT infrastructure in rural areas frequently makes it difficult to provide ICT education and widens the digital divide (Sulaiman & Halamy, 2021; Esa et al., 2021). The mindset of the rural community, which appears to be unable to adapt and learn about ICT, is another barrier to ICT education. This is due to the fact that the majority of them lacked appropriate computer facilities, knowledge, and even computer literacy (Sulaiman & Halamy, 2021; Nair et al., 2010). Ojo et al (2022) have studied digital divides in the Malaysian metropolitan region by focusing their research on the internet engagement aspect. Their study's findings demonstrate that extrinsic motivation (which involves engaging in an activity in order to achieve the desired result that is distinct from the action itself) and internet proficiency are crucial elements in determining internet engagement. According to Faziharudean and Mitomo (2003), there is a digital divide between Kelantan's urban and rural senior high school students in terms of their use of the Internet. Their finding showed that the parent factor (observable variables used to measure parent factor are parent income, respondents' fathers Internet literacy, and ownership of PC) is found to be the most influencing factor for the use of the Internet among students.

There are also researchers who examine the issue of digital divide from the perspective of digital divide gender (Ahmad et al., 2019; Ismail 2012). It is evident from empirical studies that women in developing countries use technology at considerably lower rates than males do (Antonio & Tuffley, 2014). Ahmad et al (2019) found no disparities in digital device ownership among secondary school students in Hulu Langat district. However, there was a gender gap in digital proficiency, with male students having higher digital skills than female students. According to Ismail (2012), gender-specific traits like lack of confidence, inferiority complex, and gender stereotypes are what contribute to the digital divide between male and female respondents in Perlis.

Although there are numerous studies that focus on the digital divide, relatively little is known about how attitude factors contribute to the issue. People's attitudes can have a big impact on whether or not they want to adopt new technologies. Aswathi and Haneefa (2020) claim that some students have a negative attitude regarding the use of digital technology in education. The non-use of computers and the Internet is influenced by factors including lack

of interest or need. According to the research by Lebens et al (2009), low socioeconomic level children at Germany's general secondary schools reported feeling threatened and tense when they considered using computer applications or when they observed computer-related work there. The demographic aspect also affects how people feel about using technology, whether positively or negatively. A person who lives in a rural area too long tends to feel reluctant to start using technology. As a result, the outcome is seen as a negative attitude and a resistance to changes or technology (Tokiran et al., 2021). It is necessary to analyze whether attitudes toward information and communication technology play a significant role in contributing to the digital divide among students in the Malaysian context. Therefore, a scale to evaluate the attitude toward information and communication technology that may contribute to the digital divide is required. Thus, the Fuzzy Delphi Method will be used in this study to revalidate the dimensions of attitude toward information and communication technology and digital divide and finally create a reliable scale.

### The Research Aims

This study aimed to revalidate the scale of attitude toward information and communication technology (ICT) and the impact on digital divide, and get expert consensus and views for this scale by using Fuzzy Delphi method. If the items reach consensus and are valid through the expert judgment process, then a reliable scale of attitude towards ICT can be created. Future studies on the digital divide will now be able to consider attitudes toward ICT as a contributing factor (determinant) of the digital divide in Malaysia.

### Methodology

This study specifically uses the Fuzzy Delphi Method (FDM). The decision to employ this method was made because it offers a unique way to get the consent from experts to make a concrete decision. The development of the questionnaire's elements involves two phases. Researchers must first evaluate and choose the necessary elements through an analysis of the literature. The researcher forms an expert questionnaire 7 points in the second phase, after obtaining all the necessary elements. The questionnaire is then distributed to 7 experts with specific expertise and analyzed using the Fuzzy Delphi Method (FDM).

### Sampling Procedure

This study uses of purposeful sampling in the analysis. Since the researcher is looking for an expert opinion on a particular subject, this method is ideal. Hasson, Keeney, and McKenna (2000) claim that purposeful sampling is the Fuzzy Delphi Method's most acceptable tactic. Seven experts participated in this study (Table 1). These experts were chosen based on their qualifications and area of expertise. If each expert participating in this analysis is the same, then 5 to 10 professionals are needed. When there is some consistency, the minimum Delphi expert group size ranges from 10 to 15 (Adler & Ziglio, 1996).

Table 1

*List of Experts*

Expert	Field of expertise	Institution
4 Senior Lecturers	Business & Management, Marketing	Public University
3 Lecturers	Finance	Public University

### Expert Criteria

The selection of qualified experts is one of the crucial components of the Fuzzy Delphi study. When experts are selected incorrectly, the legitimacy, validity, and reliability of the study's findings may be questioned (Mustapha & Darusalam, 2017). Mullen (2003) defined an expert as someone who is knowledgeable and skilled in a particular field or subject. The researcher selects experts with at least five years of experience, who are relevant to the study and their field, and experts who are suited for the study based on a set of criteria.

### Fuzzy Delphi Step

Table 2

#### Fuzzy Delphi Step

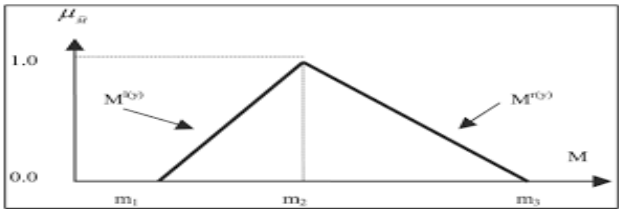
Step	Formulation
1. Expert selection	<ul style="list-style-type: none"> <li>This research incorporated the opinions of a total of seven experts. An expert panel was put together to examine the significance of the evaluation criteria on the items under consideration using linguistic variables, definitions of potential issue with the piece, and other methods.</li> </ul>
2. Determining linguistic scale	<ul style="list-style-type: none"> <li>All linguistic variables are transformed into fuzzy triangle counting (triangular fuzzy numbers) during this process. The translation of linguistic variables also incorporates the insertion of fuzzy numbers (Hsieh et al., 2004). The values <math>m_1</math>, <math>m_2</math>, and <math>m_3</math> are represented by the triangular fuzzy number, which has the following form: <math>(m_1, m_2, m_3)</math>. The value of <math>m_1</math> denotes the smallest possible value, <math>m_2</math> is a rational value, and <math>m_3</math> denotes the maximum possible value. To convert linguistic variables into fuzzy numbers, triangular fuzzy numbers are used to produce fuzzy scale.</li> </ul> 
3. The Determination of Linguistic Variables and Average Responses	<ul style="list-style-type: none"> <li>All measurement results must be converted to fuzzy scales after the researcher receives feedback from the designated expert. This is often referred to as the acknowledgment of each answer (Benitez et al., 2007).</li> </ul>
4. The determination of threshold value "d"	<ul style="list-style-type: none"> <li>The threshold value is crucial for determining the degree of expert consensus (Thomaidis et al., 2006). The distances for each fuzzy integer <math>m = (m_1, m_2, m_3)</math> and <math>n = (m_1, m_2, m_3)</math> are determined using the formula:</li> </ul>

Figure 1: Triangular fuzzy number

	$d(\bar{m}, \bar{n}) = \sqrt{\frac{1}{3} [(m_1 - n_1)^2 + (m_2 - n_2)^2 + (m_3 - n_3)^2]}$
<b>5. Identify the alpha cut aggregate level of fuzzy assessment</b>	<ul style="list-style-type: none"> <li>If there is agreement among experts, each item is given a fuzzy number (Mustapha &amp; Darussalam, 2017). The approach for measuring and computing fuzzy values is described below: (1) <math>A_{max} = \frac{1}{4} (m_1 + 2m_2 + m_3)</math></li> </ul>
<b>6. Defuzzification process</b>	<ul style="list-style-type: none"> <li>This process uses the formula <math>A_{max} = \frac{1}{4} (a_1 + 2a_m + a_3)</math>. If the researcher utilises average responses or average fuzzy numbers, the resulting score will be a number between 0 and 1 (Ridhuan et al. 2014). There are three formulas used in this process, namely: i. <math>A = \frac{1}{3} * (m_1 + m_2 + m_3)</math>, or; ii. <math>A = \frac{1}{4} * (m_1 + 2m_2 + m_3)</math>, or; iii. <math>A = \frac{1}{6} * (m_1 + 4m_2 + m_3)</math>. A-cut value = median value for '0' and '1', where <math>\alpha</math>-cut = <math>(0 + 1) / 2 = 0.5</math>. The item will be rejected if the resulting A value is less than the <math>\alpha</math>-cut value = 0.5 since it does not show expert agreement. Bojdanova (2006) asserts that the alpha cut value ought to be more than 0.5. It is supported by Tang &amp; Wu (2010), who said that the -cut value ought to be more than 0.5.</li> </ul>
<b>7. Ranking process</b>	<ul style="list-style-type: none"> <li>By defining items based on defuzzification values and the consensus of experts that the element with the highest relevance is the most crucial place for decision, the placement process is carried out (Fortemps &amp; Roubens, 1996).</li> </ul>

Source: Mustapha et al (2022)

### Instrumentation

The Fuzzy Delphi research instrument was created by the researcher using pre-existing relevant literature material. Based on the literature, pilot studies, and experience, researchers can develop questionnaire items (Skulmowski et al., 2007). Therefore, researchers used published work and literature to collect the key elements of attitude toward information and communication technology and the digital divide. A list of expert questions is then created using a 7-point scale. Since more scales produced more precise and ideal results, the 7-point scale was adopted. To make it easier for experts to answer the questionnaire, the researcher replaced the Fuzzy value in Table 3 to a value on a 1–7 scale.

Table 3

*Triangular Fuzzy Numbers for Seven-point Scale*

Item	Fuzzy number
<b>Extremely Unimportant</b>	(0.0, 0.0, 0.1)
<b>Very Unimportant</b>	(0.0, 0.1, 0.3)
<b>Unimportant</b>	(0.1, 0.3, 0.5)
<b>Moderately Important</b>	(0,3, 0.5, 0.75)
<b>Important</b>	(0.5, 0.75, 0.9)
<b>Very Important</b>	(0.75, 0.9, 1.0)
<b>Extremely Important</b>	(0.9, 1.0, 1.0)

Based on a review of the literature, researchers emphasized the crucial aspects of attitude toward information and communication technology and the digital divide. The researchers will assess the experts' validity and consensus as to whether this aspect is appropriate to be included in this model using the Fuzzy Delphi method in the next step.

Table 4

*The List of the Attitude toward Information and Communication Technology and Digital Divide*

	Early item rank	Attitude toward Information and Communication Technology and Digital Divide
<b>Attitude towards ICT and Digital Divide</b>	DD1	I am very comfortable to use computer
	DD2	Using the computer is clear and understandable
	DD3	I am not bothered about security issues related to the Internet
	DD4	The information available on the Internet is trustworthy
	DD5	Use of computer and other digital devices can cause health problems
	DD6	I like to work with computer and mobile phone
	DD7	Using the Internet makes learning fun
	DD8	I am not interested in developing my skills and knowledge to use computer and the Internet.
	DD9	I do not enjoy talking with others about computer and the Internet applications
	DD10	I am not interested in a career that involves the extensive use of ICT
	DD11	I can use the Internet effectively and efficiently
	DD12	I am sure I can do works using computer
	DD13	I can learn new software easily
	DD14	I can select appropriate Internet based e resources for learning
	DD15	My skills and knowledge in computer and other digital devices are not adequate
	DD16	Knowledge of computer will widen job opportunities
	DD17	I feel left behind if I do not use ICT
	DD18	Using the Internet enables me to accomplish tasks more quickly
	DD19	Using the Internet improves my academic performance
	DD20	The Internet helps me better to get the latest knowledge than other resources

Source: Aswathi & Haneefa (2020)



**Finding**

An expert consensus on several facets of the attitude toward information and communication technology and the digital divide will be provided in this part. Seven experts in the relevant fields were given Fuzzy Delphi questions to answer, and the results were compiled based on their responses. The study's findings are listed below (Table 5):

Table 5

The Analysis Result

Results	Perception of Comfort/Anxiety					Perception of Liking					Perception of Confidence					Perceived Usefulness				
	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item 13	Item 14	Item 15	Item 16	Item 17	Item 18	Item 19	Item 20
Expert1	0.00	0.02	0.00	0.07	0.04	0.02	0.04	0.08	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.04	0.01	0.01	0.01
Expert2	0.00	0.02	0.10	0.15	0.01	0.02	0.04	0.02	0.01	0.01	0.01	0.03	0.03	0.02	0.02	0.04	0.01	0.04	0.04	0.04
Expert3	0.00	0.02	0.00	0.04	0.04	0.02	0.00	0.02	0.01	0.04	0.04	0.02	0.02	0.03	0.03	0.01	0.01	0.01	0.01	0.01
Expert4	0.10	0.03	0.06	0.07	0.01	0.03	0.00	0.09	0.04	0.01	0.01	0.03	0.03	0.02	0.03	0.04	0.01	0.01	0.01	0.01
Expert5	0.06	0.03	0.00	0.13	0.01	0.02	0.00	0.02	0.04	0.01	0.04	0.02	0.03	0.02	0.02	0.01	0.01	0.01	0.01	0.01
Expert6	0.00	0.02	0.00	0.04	0.01	0.03	0.04	0.02	0.01	0.04	0.01	0.03	0.02	0.03	0.02	0.13	0.04	0.01	0.04	0.04
Expert7	0.00	0.03	0.00	0.04	0.01	0.03	0.12	0.09	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.04	0.04	0.04	0.04	0.01

Statistics	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item 13	Item 14	Item 15	Item 16	Item 17	Item 18	Item 19	Item 20
Value of the item	0.03064	0.02828	0.03064	0.08012	0.02357	0.02828	0.04242	0.05184	0.02357	0.02357	0.02357	0.02828	0.02828	0.02828	0.02828	0.04713	0.02357	0.02357	0.02357	0.02357
Value of the construct	0.03087																			
Item < 0.2	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
% of item < 0.2	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

<b>Average of % consensus</b>	<b>100</b>																			
<b>Defuzzification</b>	<b>1</b>	<b>0.88571</b>	<b>0.94286</b>	<b>0.88571</b>	<b>0.77143</b>	<b>0.97143</b>	<b>0.94286</b>	<b>0.91429</b>	<b>0.85714</b>	<b>0.92857</b>	<b>0.97143</b>	<b>0.97143</b>	<b>0.94286</b>	<b>0.94286</b>	<b>0.95714</b>	<b>0.94286</b>	<b>0.92857</b>	<b>0.97143</b>	<b>0.92857</b>	<b>0.97143</b>
<b>Ranking</b>	<b>1</b>	<b>7</b>	<b>4</b>	<b>7</b>	<b>9</b>	<b>2</b>	<b>4</b>	<b>6</b>	<b>8</b>	<b>5</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>4</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>2</b>	<b>5</b>	<b>2</b>
<b>Status</b>	<b>Acc ept</b>	<b>Acc ept</b>	<b>Acc ept</b>	<b>Acc ept</b>	<b>Acc ept</b>	<b>Acc ept</b>	<b>Acc ept</b>	<b>Acc ept</b>	<b>Acc ept</b>	<b>Acc ept</b>	<b>Acc ept</b>	<b>Acc ept</b>	<b>Acc ept</b>	<b>Acc ept</b>	<b>Acc ept</b>	<b>Acc ept</b>	<b>Acc ept</b>	<b>Acc ept</b>	<b>Acc ept</b>	<b>Acc ept</b>

According to the analysis of findings, all of the threshold values after data processing are below 0.2 ( $< 0.2$ ) (see table 5). In other words, the selected items are accepted by every expert. On the other hand, the average threshold value (d) 0.2, or 0.03087, for all items of attitude toward information and communication technology and the digital divide, is below  $< 0.2$ . The item displays a high level of the expert agreement if the average (d) value is less than 0.2 (Cheng & Lin, 2002; Chang, Hsu & Chang, 2011). The overall percentage of expert agreement, which is equal to 100 percent and higher than ( $> 75$  percent), shows that the item's expert agreement standards have been satisfied.

Table 6

*The List Based on Expert Consensus*

	Early rank	item New rank	item Attitude toward Information and Communication Technology and Digital Divide
<b>Attitude towards ICT and Digital Divide</b>	DD1	DD1	I am very comfortable to use computer
	DD2	DD7	Using the computer is clear and understandable
	DD3	DD4	I am not bothered about security issues related to the Internet
	DD4	DD7	The information available on the Internet is trustworthy
	DD5	DD9	Use of computer and other digital devices can cause health problems
	DD6	DD2	I like to work with computer and mobile phone
	DD7	DD4	Using the Internet makes learning fun
	DD8	DD6	I am not interested in developing my skills and knowledge to use computer and the Internet.
	DD9	DD8	I do not enjoy talking with others about computer and the Internet applications
	DD10	DD5	I am not interested in a career that involves the extensive use of ICT
	DD11	DD2	I can use the Internet effectively and efficiently
	DD12	DD2	I am sure I can do works using computer
	DD13	DD4	I can learn new software easily
	DD14	DD4	I can select appropriate Internet based e resources for learning
	DD15	DD3	My skills and knowledge in computer and other digital devices are not adequate
	DD16	DD4	Knowledge of computer will widen job opportunities
	DD17	DD5	I feel left behind if I do not use ICT
	DD18	DD2	Using the Internet enables me to accomplish tasks more quickly
	DD19	DD5	Using the Internet improves my academic performance
	DD20	DD2	The Internet helps me better to get the latest knowledge than other resources

### Conclusion & Suggestion

The rapid advancement of information and communication technology has significantly improved people's lives in a variety of ways. However, in order to take use of this beneficial information and communication technology, people must pass several barriers such as financial limitations and computer proficiency. The development of the Internet and ICT in the field of education also has made it possible for students to receive their education remotely using network technology for both teaching and learning. However, educational institutions still struggle to achieve effective learning outcomes due to a lack of infrastructure and technical know-how, which cause a digital divide problem. In general, the digital divide expresses unequal access to and use of ICTs among individuals and populations in different countries. The majority of studies found that the digital divide was caused by social and economic disparities among various nations and regions, as well as variances in the population's demographics characteristics (Aswathi & Haneefa, 2020).

Many previous studies have found that the problem of the digital divide exists among students in the education sector in Malaysia (Ahmad et al., 2019; Surianshah, 2021; Esa et al., 2021; Faziharudean and Mitomo, 2003). Although the digital divide has been the subject of numerous research in Malaysia, little is known about how attitude factors play a role in the problem. The willingness of people to adopt new technologies can be greatly influenced by their attitudes. Therefore, in this study, the researchers have developed a Fuzzy scale for attitudes toward information and communication technology and the digital divide for students. By analyzing students' attitudes toward information and communication technology, researchers can better understand this issue and thus suggest better solutions to solve the problem.

One of the most comprehensive studies was carried out by Lythreatis et al (2022) on factors contributing to the digital divide. They found that sociodemographic, socioeconomic, personal elements, social support, type of technology, digital training, rights, infrastructure, and large-scale events plays a very significant role in digital divide. For example, the sociodemographic consists of elements such as age, race, gender, population density, geographic disparity, urbanization, rural/urban dimension, remoteness, and size of the country. Out of all the factors, personal elements are the factor that attracts our intention the most. It consists of trust, motivations, privacy concerns, risk perceptions, values, attitudes and beliefs, and religion. This is because personal elements are the only factor that influences digital divide internally while factors such as infrastructure influence digital divide externally. Put it simply, no matter how much government spends on the infrastructure of ICT, the problem of digital divide still exists if people demotivate, do not trust, or uncomfortable (attitude of belief) while using the ICT.

The digital divide in the information society should be reduced and closed, especially in the field of education. By incorporating ICT awareness and training programs relating to the beneficial function of the Internet in school, a favorable attitude toward technology can be encouraged. Additionally, in order to develop a positive attitude toward IT, students' digital literacy needs to be improved. Investment in ICT should be increased in order to improve the quality of ICT training offered to students. It is important to encourage industries to develop new user-friendly ICT hardware and software for rural populations by providing tax incentives, subsidies, and research grants (Nair et al., 2010). ICT-skilled students will be more equipped and more confident to adopt and use new technologies, which will enable them to develop a positive attitude toward ICT. In order to ensure a successful implementation of digital culture in Malaysia, particularly in the rural community, the government as well as the

people in the community should work together to overcome the challenges. All generations should be eager to pick up new skills and learn how to use technology effectively. The digital culture environment should be able to reduce the gap and digital divide between different communities in this country (Tokiran et al., 2021).

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