# CHAPTER 2

## GENERAL OVERVIEW OF MALAYSIA'S ACHIEVEMENTS IN SCIENCE & TECHNOLOGY

Malaysia's economy continued its recovery path from the Asian financial crisis that took place in 1998. Domestic output, as measured by the real GDP figures, grew from RM209.9 billion in 2000 to RM219.3 billion in 2002, representing a growth of 4.4% over the period of two years. On an annual basis, the real GDP registered a slower growth of 4.1% in 2002 as compared to 8.5% in 2000 due to a combination of weak demand in the electronics sector and the adverse knock-on the effects on the tourism-related industry as a result of the threat of international terrorism.

In terms of individual's wealth, Malaysia's income per capita improved slightly from RM13,333 in 2000 to RM13,683 in 2002 due to an almost stagnant real GNP growth of 0.3% in 2001. When adjusted for purchasing power, the income per capita for Malaysia stood at US$9,300, which was more than double the income per capita for China (US$4,400) and half of that for Taiwan (US$18,000), in line with our nation's middle - income status relative to other countries.

The share of the Malaysian government's expenditure relative to domestic output has increased during the period 2000 to 2002. The federal government's expenditure as a percentage of GDP increased from 24.7% in the year 2000 to 29.0% in 2002, financed primarily through budget deficits (-5.8% and -5.6% in the year 2000 and 2002 respectively). However, budget deficit above 5% will typically raise an alarm as it will not be sustainable over the long term. Consequently, the future expenditures in all sectors in Malaysia's economy, including those that are related to science and technology (S&T), must be driven by the private sector.

Table 2.1 provides a comparison of Malaysia's economy relative to selected countries in OECD, ASEAN and the Far East. It is apparent that a country's achievement in S&T correlates strongly with its wealth, as measured using GDP per capita. However, the monetary wealth of a country provides only one perspective to the analysis of its S&T development. This report combines all factors that contribute to the development of S&T in Malaysia, ranging from education and research activities to employment and trade in technology-related goods and services.

| Country | Real GDP Growth | GDP at Current Price GDP | Population (million) | Per Capita GDP (nominal) | Per Capita GDP (PPP) |
|---|---|---|---|---|---|
| Malaysia | 4.1% | 94,910 | 24,531 | 3,869 | 9,300 |
| Singapore | 2.2% | 88,274 | 4,171 | 21,162 | 24,000 |
| Thailand | 5.4% | 126,473 | 63,430 | 2,034 | 6,900 |
| Taiwan | 3.6% | 281,921 | 22,510 | 12,524 | 18,000 |
| South Korea | 6.3% | 476,700 | 47,640 | 10,000 | 17,000 |
| Australia | 2.8% | 409,200 | 19,663 | 20,700 | 28,100 |
| US | 2.4% | 10,383,100 | 288,600 | 36,100 | 36,100 |
| UK | 1.6% | 1,563,700 | 59,008 | 26,400 | 28,000 |
| France | 1.2% | 1,431,300 | 61,082 | 23,400 | 27,200 |
| Japan | -0.4% | 3,972,500 | 127,435 | 31,200 | 26,900 |
| Canada | 3.3% | 724,800 | 31,414 | 23,100 | 30,300 |

Note: All figures are in US$ Source: World Bank

**Table 2.1:** Economic Data for Selected Countries (2002)

## 2.1 Education in S&T

Overall, student enrolment in the science and mathematics subjects at the secondary school has increased between 2000 and 2002, despite the overall reduction in the number of students registered for SPM (-8.6%) and marginal increase (1.9%) in the overall students registered for STPM.

At the university level, both social sciences and humanities continued to be more popular than S&T related fields such as natural sciences, engineering, IT and medical sciences. More students were enrolled at public educational institutions than private educational institutions for both undergraduate and postgraduate courses. The ratio of enrolment in first degree courses was 73:27 in favour of public educational institutions. For both types of institutions, social science recorded the highest enrolment, followed by engineering and technology at public institutions, and IT and computer science at private institutions.

Enrolment in masters and doctoral degrees were heavily skewed towards public institutions. In 2002, 84.4% of the total 29,464 enrolment in masters degrees and 95.1% of the total 4,053 enrolment in doctoral degrees were at public universities. Of the enrolment at masters level, 43.4% were for natural science equivalent subjects while for doctoral degrees, the percentage was 48.4%.

A total of 51,261 students graduated at first-degree level in 2002, with 60.5% of the total coming from public universities. Again, the graduation in masters and doctorate degrees were dominated by public universities, which contributed 90.8% of the total 6,226 masters graduates and 99.2% of the total 490 doctoral graduates in 2002. A higher percentage (58.6%) of natural science equivalent graduates were recorded at doctoral level as compared to master level (32.5%), indicating a doctoral degree is still very much associated with intense research-oriented activities as emphasised by most natural science subjects.

## 2.2 Human Resource in S&T

The period between 2000 and 2002 recorded an increase in the number of researchers per 10,000 labour force from 15.6 to 18.0. Similarly, researchers per 10,000 population also increased from 6.4 to 7.3. In terms of R&D personnel, there has been an improvement from 23,262 in 2000 to 24,937 in 2002. Although the manpower in R&D is still low when measured by international standards, there is a marked improvement over the last ten years.

Examining the trends in R&D personnel in different sectors, the private sector registered a significant increase in researchers in terms of headcount (45.4%) during the period of 2000-2002. There were more male researchers, technicians and other support personnel involved in R&D compared to females in all sectors for the two years of 2000 and 2002. For the private sector, in terms of headcount, males made up 70.9% of the total R&D personnel in the sector in 2002. In the public sector, 65% males were involved in R&D in Government Research Institutes (GRIs) whereas in Institutes of Higher Learning (IHLs), the involvement was 70.5%.

The overall concentration of activities was in the order of applied research (6,981), basic research (4,508) and experimental development (2,497). For the private sector, the focus was on applied research (44.2%) and experimental development (27.8%), clearly indicating the emphasis on market driven research to satisfy market needs. For the GRIs, 37.3% of the researchers were engaged in applied research, followed by 22.6% in basic research in 2002. For the IHLs, more emphasis was given to applied research (38.4%) and basic research (33.4%).

Of the three major sectors in the economy, the field of research that received tremendous attention in 2002 in terms of the number of researchers was engineering sciences, followed by information, computer & communication technologies, and applied sciences & technologies. The two fields of research that had the least number of researchers in 2002 were marine sciences and physical sciences.

The majority of researchers in the private sector in 2002 had a bachelor's degree (68.5%), followed by masters degree (10.1%) and PhD degrees (2.4%). The field of research that attracted a large number of researchers was information, computer & communication technologies, engineering sciences and applied sciences & technologies. Earth sciences and environmental sciences had the least number of researchers. In the case of government sectors, IHLs had the highest percentage of PhD holders (41.9%), whereas GRIs had 27.6% of researchers with similar qualification.

For IHLs the distribution of researchers in the various fields in 2002 was more or less quite well distributed compared to the private sector as 9 out of the 18 fields of research had more than 500 researchers. The field with the highest number of researchers was engineering sciences, followed by social sciences and information, computer & communication technologies. For GRIs, the concentration of researchers was in agriculture and engineering sciences. The distribution suggested that private sector R&D is market-driven and customer-focused, whereas GRIs and IHLs undertake research in areas that the private sector does not emphasise.

Analysis on Malaysian-born scientists and engineers currently working abroad is limited due to data unavailability. In the case of US for 1999, most of the Malaysian-born scientists and engineers were still holding Malaysian citizenship (67.5%), despite working in the U.S. Of these, 42.5% held a permanent visa and another 26.3% had a temporary visa. Almost one-third (32.5%) were already U.S. citizens. The largest proportion of these R&D workers was in engineering, followed by computer and mathematical sciences, and life sciences. In terms of sector of employment, more than three-quarters worked in the business and industry sector (77.6%). Slightly more than 10% worked in the education sector, presumably in universities or colleges throughout the U.S. About 9.2% worked in the government sector.

In the case of Australia for 2001, 1,578 Malaysian-born scientists and engineers worked in the country, with slightly more than half (56.7%) becoming Australian citizens. In terms of gender, more than three-quarters were males. Almost three-quarters were working in the private sector, while the rest worked with the state/territory government. 71.3% of these R&D workers were working as building and engineering professionals, while the rest were engaged as natural and physical science professionals.

## 2.3 Research and Development (R&D) Activities

Overall, the R&D expenditure increased steadily from RM1,671.5 million in 2000 to RM2,500.6 million (an increase of 49.6%) in 2002. About two-thirds of the R&D expenditure (65.3%) came from the private sector, 20.3% from Government Research Institutes (GRIs), and the remaining 14.4% derived from Institutes of Higher Learning (IHLs). The R&D expenditure for the private sector increased both in real terms and in terms of percentage contribution towards total R&D expenditure for the whole economy, from 57.9% in 2000 to 65.3% in 2002. Corresponding to the overall increase in R&D expenditure for the 2000-2002 period, all sectors within the economy recorded an increase in R&D expenditure. For the private sector, the amount of expenditure increased by RM665.2 million or 40.7%, while GRIs and IHLs also experienced an increase in spending on R&D amounting to RM89.6 million (an increase of 21.5%) and RM74.3 million (an increase of 26.0%), respectively. This indicates that the overall increase in total R&D expenditure during the reference period was mainly by the private sector. In terms of the GERD/GDP ratio, the increase was from 0.50 in 2000 to 0.69 in 2002.

The total R&D expenditure in year 2002 was RM2.5 billion, an increase of RM829.1 million or 49.6% from year 2000. In 2000, capital expenditure was 51.7% of total expenditure and current expenditure made up 48.3%. The structure of expenditure had changed significantly together with the increase in total expenditure. Compared to 2000, the percentage had increased by 7.4%. The increase was relative to GRIs and IHLs which had proportionally less expenditure in 2002 compared to 2000.

The manufacturing sector is the engine of growth for Malaysia. Building capacity for R&D in the private sector will enhance the competitiveness of the sector in terms of new product development and process innovation. Although companies with revenues of less than RM10 million made up 37.9% of the respondent companies, the amount of R&D spent made up only 11.5% of total private sector R&D expenditure, indicating the limited resources of small companies for R&D.

GRIs that are involved in agricultural research and IT, such as FRIM, MPOB, and MIMOS, experienced a significant increase in expenditure. MIMOS alone accounted for 61.6% of the total R&D expenditure in 2002. For current expenditure, in general, most of the agencies experienced a decline in expenditure in 2002. For capital expenditure, the opposite was found, i.e., most agencies saw an increase in expenditure in 2002. Total expenditure increased by 21.5%, in which capital expenditure experienced a significant increase of 121.6%, whilst the current expenditure declined by 48.9%.

Universiti Sains Malaysia (USM) experienced the highest growth of total expenditure with a 161.2% increase. The bulk of this increase was for current expenditure. For Universiti Malaya (UM), the increase was mainly due to an increase in capital expenditure. In 2002, UPM, previously the highest spender of R&D expenditure amongst the IHLs, experienced a decline in expenditure by 34.2% when compared to the 2000 figure. The amount of expenditure by other universities was still small.

In terms of R&D output, the total number of patent applications has declined over the years. The total number of patents applied for the period 2001-2002 has dropped compared to the number of applications for the period 1999-2000. On the whole, the total number of patents granted for residents and non-residents has increased from 1,126 to 2,962 for the period 1999-2000 and 2001-2002, respectively. The increase is largely due to the increase in the number of patents approved for non-residents. While the number of applications by residents for the period 2001-2002 has increased by about 60% compared to the 1997-1998 period, there was no corresponding increase in the number of approvals. The number of approved patents was 50 for the period 2001-2002 compared to 73 for the period 1997-1998. The field of chemistry and metallurgy has the highest number (4,115 or 27.91%) of patents granted since 1988. The total number granted was 2,962 for 2001-2002 compared to 1,125 and 1,352 for 1999-2000 and 1997-1998, respectively.

## 2.4 Innovation

About 35% of the manufacturing firms that responded to the MASTIC survey indicated that they carried out innovating activities during the period 2000-2001. The number of innovators varied across industries in the manufacturing sector. The highest number of innovators were found in industries such as electrical machinery and apparatus (67%), textile products (73%), scientific instruments (75%), motor vehicles (80%), and radio, television and communications equipment (82%).

In terms of firm size, innovating activities tended to be carried out in larger firms. While majority of innovating and non-innovating firms tend to be locally-owned firms, foreign ownership presence is greater amongst innovating firms than non-innovating firms. Most of the innovating firms (71%) were limited companies (Sendirian Berhad) while a smaller proportion of non-innovating firms (44%) were limited companies. Some 50% of non-innovating firms were sole-proprietorship and partnership firms.

Most of the innovating companies were established within the period 1980-1999. Some 39% of the innovating firms were established in the period 1990-1999 while 25% of the innovating firms were established during 1980-1989.

The survey also indicated that innovation was carried out by firms of all sizes. Some 46% of innovating firms were small firms (< 50 employees) while medium-sized (50-249

employees) and large-sized firms (>249 employees) account for 27% and 25% of total innovating firms, respectively. In terms of firm size measured by turnover, about 45% of innovating firms had annual turnover exceeding RM10 million.

Most of the innovating companies (73%) were involved in both product and process innovation. Some 58% of innovating companies were reported to have on-going projects with product and process innovations.

From the survey, the most important objective for innovation was the improvement of product quality. Some 81% of all innovating firms cited this as an important objective of innovation. Other important objectives included the opening up of new markets or increase in market share (47%) and the extension of product range (46%).

Only 32% of the innovating firms indicated government support as a highly important reason for undertaking innovation activities. Around 95% of the innovating companies (or 245 firms) reported that they did not receive any government support or incentives. For those receiving government support, the most popular avenues were duty free importation of machinery or equipment (55 firms), tax incentives (21 firms) and technical support services (16 firms).

There are significant variations in the impact of innovation on an industry's turnover. They range from as low as 15% (in the machinery and equipment industry) to as high as 70% (in leather goods industry). For most industries, the impact of innovation on turnover was within the range of 20-50%.

## 2.5 Trade in Technology

Malaysia continued to register a trade surplus in high technology goods, although the trend indicated a decreasing surplus from the peak of RM 51.5 billion in 1999 to RM 34.9 billion in 2002. However, the country posted an improvement in the trade deficit of medium-high technology goods, where the figure has improved from the highest deficit of RM 22.2 billion in 2000 to a deficit of RM 17.3 billion in 2002. Overall, exports in medium and high technology goods were still higher than imports, which ran parallel to the overall trade surplus that the country was enjoying in all categories.

The picture was not so rosy for technology-related services. The country registered a net outflow of money, amounting to RM 6.8 billion in 2002 for the payment of royalties, contracts and professional charges, and construction and engineering. Although this was an improvement from the highest deficit experienced in 2000 (RM 7.9 billion), coverage ratio (51.3%) in 2002 was far lower than the highest achieved in 1998 (72.7%). Data showed that the problem lies with royalties, which registered a meagre growth of 0.1% in receipts but high growth in payments (17.4%) over the last 10 years.

## 2.6 Publications and Citations

Publications and citations are important measures or indicators of scientific knowledge creation and diffusion. Most large scale macro-level bibliometrics studies are based on the analysis of research papers and citation links of databases from the ISI databases. The advantages of the ISI databases are that the journals and scientific publications are selected based on some quality criteria (e.g. peer reviewed journals) and is currently the only source that allows for a complex analysis of publications by countries, institutions, authors and scientific disciplines.

In terms of publication output by country, the United States has the highest output of papers (37.64%) followed by the United Kingdom ( 9.06%) and Japan (8.13%). Malaysia's share or output of papers stands at 0.08% of the world output. Malaysia was ranked at the 55th position among 178 nations as at 2002.

For Malaysia the most productive field output in scientific disciplines was Physical Chemistry/Chemical Physics at 7.95% of total Malaysian output for the period of 1981-2002. This is followed by Materials Science and Engineering, Organic Chemistry/Polymer Science and Environment/ Ecology.

Using standard fields or combining fields, the four fields with the highest productivity in Malaysia are Clinical Medicine, Chemistry, Plant and Animal Sciences and Agricultural Sciences. International comparison of fields shows Malaysia's share of papers in Agricultural Chemistry is the highest at 0.51% of world output. Although Physical Chemistry/ Chemical Physics is the most productive field in Malaysia, in international terms, Malaysia's share in this field amounts to a mere 0.08% of the world output.

In Malaysia, the higher productivity in the medical and life sciences publications which include outputs in the fields of agriculture science, ecology and environment, can be linked to the greater investment and funding geared toward national policies which may be related to political will (e.g. war against cancer), scientific developments (e.g. revolutionary findings in molecular biology) and socio-economic needs (e.g. aging society, spread of diseases such as SARs, JE etc.). Malaysia's contribution in these fields is however insignificant when compared to the rest of the world, as the USA, UK and Japan, contribute the most to the world output. Malaysia's contribution to the world is more significant in the field of agricultural sciences, particularly agricultural chemistry, although the amount of her contribution is still a very modest 0.51% of the world output. Malaysia has still a long way to go in the S&T fields in terms of publication output.

## 2.7 Public Awareness in S&T

The chapter on public awareness of science and technology is based on the report of the survey on "Public Awareness of Science and Technology in Malaysia, 2002". Overall, there has been an improvement in the level of perceived knowledge about S&T-related and general issues for year 2002 compared to year 1998 and 2000. For the 11 issues examined, eight enjoyed an improvement in the score while the remaining three showed a decline in the knowledge score. The level of perceived knowledge reported range from 2.04 to 2.78. Males were generally more aware and had a higher level of perceived knowledge in S&T-related and general issues compared to women. Findings show that youths were consistently the group with the highest level of perceived knowledge compared to children and adults.

In terms of stated interest in S&T-related and general issues, overall the level of interest shown was low. Based on the scale of 1 to 4, the highest level of interest reported was 2.66 in the area of environmental pollution while the lowest level of interest was for the issue of "international and foreign policies" (mean = 2.10). In addition to the general lack of interest in the issues examined, the level of interest had deteriorated for five of the 11 issues examined compared to findings of year 2000. These five areas were: "environmental pollution", "new inventions from Malaysia", "economy and business", "new technology and inventions", and "national education policy". Comparing between males and females, males had a higher level of expressed interest in S&T-related and general issues. Unlike findings of the 2000 survey where females showed a higher level of interest in three fields out of the 11 examined, the survey results of 2002 show that females scored lower in all areas in terms of interest expressed.

Comparing the interest among the three age groups, it is obvious that the youths had the highest level of interest compared to children and adults. The only two areas that children showed greater interest than adults were "aerospace exploration" and "application of computer technology". Within group comparisons in the level of interest among youths show that there was a decline in four of the 11 issues examined. They were "environmental pollution", "new inventions from Malaysia", "economy and business", and "new technology and inventions".

In examining the attitude of the Malaysian public toward science and technology, the decline in the percentage of respondents agreeing with statements that relate to the role of science and technology does not augur well for the development of S&T, especially in an era that is S&T-driven. The statement "S&T make our life healthier, easier and more comfortable" continued to enjoy a high percentage of agreement at 80.6% even though the percentage agreeing with this

statement has dropped by 6.5% from 2000. The percentage of respondents agreeing with the statement "Daily chores are more interesting with the application of S&T" has dropped drastically from 86.2% in 2000 to 67.8% in 2002. Similarly, for statements "Most scientists work toward improving life" and "I need to know about science in my daily life" had suffered substantial drop in percentage of respondents agreeing with them.

The attitude of all the three age groups toward science and technology had grown less favourably, with the percentage decline being most drastic among children. Youths remained the group with the most favourable attitude even though the decline cut across all age groups. For children, they were the least positive about S&T-related benefits.

A rural-urban comparison shows that urban respondents in general had a more positive attitude toward science and technology as compared to those in the rural areas. Both males and females shared similar attitudes about science making life healthier, easier and more comfortable. Almost an equal percentage of males and females agreed that the government should support S&T research, the quality of science and mathematics education is not satisfactory, new inventions will counteract harmful consequences of technological advancement, and that S&T is very important for societal advancement. The only statement that males and females differed in the percentage of respondents in agreement was "Scientists should research about health even if it causes pain to animals" in which 37.5% of males agreed compared to 34.0% of females.

## 2.8 Public Support for S&T

Chapter 10 provides details on the schemes and incentives by the government to further promote R&D activities. Several new schemes were introduced in 2002: Technology Acquisition Fund for Women, E-Manufacturing Grant, Grant for RosettaNet Standard Implementation for SMEs and Grant for Upgrading Engineering Design Capabilities.

For the existing schemes, the pattern of utilisation is different for the different types of schemes. The applications and approvals for Commercialisation of R&D Fund (CRDF) suffered a phenomenal decrease in the number of applications in the 2001-2002 period as compared to the 1999-2000 period, i.e., from 99 to 17, respectively. As a consequence of the small number of applications, the number of projects approved for the grants correspondingly decreased from 26 for the period 1999-2000 to only 10 for the time frame of 2001-2002. While Electrical and Electronics (E&E) was the sector with the highest number of applications in 1999-2000, it had only one application in 2002. Biotechnology which enjoyed as many as 5 applications in 1999 did not have any applications for the entire period of 2001-2002.

Tax incentives in the form of double deductions for revenue expenditure on R&D remain attractive amongst industries. A marked increase in the application for double deduction for expenses related to R & D can be seen in the 2001-2002 period as compared to the corresponding period of 1999-2000. The number of applications in the current period increased to 582 and 684 for 2001 and 2002, respectively from 162 in the previous year. This is attributable to the huge surge in applications from the automotive parts industry that had experienced an increase of about 10 times the number of projects applied.

For year 2001, the industry that had the largest amount of deductions approved was the semiconductor industry with a total deduction of RM24.6 million followed by the agriculture-palm oil, rubber, cocoa, and fruit sector with deductions amounting to RM12.5 million. For year 2002, the industry with the largest amount approved was the automotive parts industry followed by the agriculture industry. The strong surge in the amount of double deductions granted to the automotive parts industry (from about RM0.8 million in 2000 and 2001 to RM87.8 million in 2002) signifies the intensity of competition within the industry.

Analysing ITAF by industry in 2001 and 2002 shows that in 2001, about RM1.6 million was provided to successful applicants under the ITAF 2 scheme, and about RM9 million was disbursed under ITAF 3. In 2002, the

amount for ITAF 2 increased to about RM3.5 million while the amount approved for ITAF 3 reached about RM13.7 million.

DAGS, which was introduced to develop the information and communication technology industry in Malaysia, shows that in 2001, a total of 51 applications were received versus 14 in 2002, representing a decrease of 37 applications. Corresponding to the decrease in the number of applications, the amount applied dropped from about RM100.4 million in 2001 to RM33.3 million in 2002. The private sector had been the most active sector in utilising this scheme.

In 2000, under the MGS scheme, 10 out of the 24 applications were approved, totaling close to RM22 million against the amount applied of RM138.9 million. In 2001, the number of applications dropped to 13 resulting in the decline in the number of approvals to 6 with the total amount approved decreasing to around RM12.5 million (Amount applied was RM50.5 million). Total applications and approvals rose slightly in 2002 to 16 and 8 respectively with the total funds disbursed reaching to about RM16.1 million. The industries that were active in the application for funding were the business application software and the engineering application software industries for both 2001 and 2002.

Intensification of Research in Priority Areas (IRPA) was introduced by the government to boost R&D activities especially in national R&D priority areas for knowledge enhancement and commercialisation. Among public institutions of higher learning, Universiti Putra Malaysia was the leading university in terms of the number of projects and amount of allocation approved. For public institutions, MARDI was the most active with a total of 63 projects approved. Allocation by industry shows that the most active industries were manufacturing and construction, followed by agro-industry.

## 2.9 International Comparisons

Any comparison between Malaysia and other countries should take into account the different levels of economic development. Malaysia's gross national income per capita is currently about one tenth to one fifth that of developed countries. There are also considerable differences in the economic structure of the Malaysian economy and those of developed economies. In developed economies, the services sector plays a larger role in the national economy while the agriculture sector's role is fairly insignificant.

The percentage share of degrees granted in the area of science and engineering in public universities at 37% is fairly high compared to similar figures for public and private universities in more developed countries.

The overall level of innovation in Malaysia's manufacturing sector at 35% is below that achieved in most of the developed countries in Europe. European countries with comparable levels of innovation include Finland (36%) and Belgium (34%). As in other countries, larger firms tend to be more innovative than smaller firms.

In the area of trade in technology, the combined manufacturing export shares of high technology and medium-high technology manufacturing industries at 42% is lower than the 50-80% levels observed in developed countries.

The gap between Malaysia and developed countries is even larger in the area of S&E publications. Malaysia's S&E articles per capita are currently around 22, well below the 400–1100 levels observed in developed countries.

The general level of public awareness and understanding of knowledge in science and technology is also lower in Malaysia compared to that observed in developed countries. However, there are some areas of knowledge in S&T in which the Malaysian public shows a comparable level of understanding.