Adaptasi Soal Selidik UTAUT2 Instruksional Pengaturcaraan untuk Sekolah Rendah dalam Bahasa Melayu: Satu Prosedur Kesahan Muka dan Kandungan

Masyithoh Md Zuber^{*}& Mohd. Asyraf Mansor

School of Distance Education, Universiti Sains Malaysia, 11800 USM, Pulau Pinang, Malaysia

*Corresponding author: masyithohmz@gmail.com

Published: 11 November 2023

To cite this article (APA): Md Zuber, M., & Mansor, M. A. (2023). UTAUT2 Primary School Programming Instructional Questionnaire Adaptation to Malay Language: A Face and Content Validation Procedure. *Jurnal Pendidikan Sains Dan Matematik Malaysia*, *13*(2), 75–85. https://doi.org/10.37134/jpsmm.vol13.2.7.2023

To link to this article: https://doi.org/10.37134/jpsmm.vol13.2.7.2023

ABSTRACT

This research adopted the extended version of the Unified Theory of Acceptance and Use of Technology (UTAUT2) to assess the level of acceptance of programming in the classroom by primary school mathematics teachers in Malaysia. It aims to translate the English questionnaire based on UTAUT2 into Malay. This process consists of three major components: preliminary consideration, translation, and validation. The translation procedure consists of seven stages, and its validation is determined by the content validity ratio (CVR). Six experts were involved in the translation procedure, while eight experts were involved in the content validity evaluation. The results indicate that three of the thirty submitted items must be rejected: items 8 (demography), 27 (hedonic motivation), and 30 (behavioural intention). As a result, the UTAUT2 questionnaires have been translated into Malay, assessed for contextual and sentence stuctures congruence between the original version and the translation, and adapted based on the research conducted in the appropriate context.

Keywords: UTAUT2, Content Validity, Content Validity Ratio (CVR), programming, mathematics education

ABSTRAK

Kajian ini mengguna pakai versi lanjutan Teori Penerimaan Bersepadu dan Penggunaan Teknologi (UTAUT2) untuk menilai tahap penerimaan pengaturcaraan dalam bilik darjah oleh guru matematik sekolah rendah di Malaysia. Ia bertujuan menterjemah soal selidik UTAUT2 dalam Bahasa Inggeris ke dalam bahasa Melayu. Proses ini terdiri daripada tiga komponen utama: pertimbangan awal, terjemahan dan pengesahan. Prosedur terjemahan terdiri daripada tujuh peringkat, dan pengesahannya ditentukan oleh nisbah kesahan kandungan (CVR). Enam pakar terlibat dalam prosedur terjemahan, manakala lapan pakar terlibat dalam penilaian kesahan kandungan. Keputusan menunjukkan bahawa tiga daripada tiga puluh item yang diserahkan mesti ditolak: item 8, 27, dan 30. Hasilnya, soal selidik UTAUT2 telah diterjemahkan ke dalam bahasa Melayu, dinilai untuk kesetaraan kandungan dan struktur ayat antara versi asal dan terjemahan, dan disesuaikan berdasarkan konteks kajian yang dijalankan.

Kata Kunci: UTAUT2, Kesahan Kandungan, Nisbah Kesahan Kandungan (CVR), pengaturcaran, pendidikan matematik. INTRODUCTION

There is an undeniable correlation between mathematical and programming skills. The effects of incorporating programming into education can be observed across three categories: the interplay between mathematics and programming, the utilisation of programming as tools and devices, and the use of didactical practises (Holo et al., 2022). The interconnection between programming and mathematical skills can be observed through algebraic reasoning, algorithm structure, and pattern recognition. This particular capability fosters a culture of analytical thinking among pupils. Through programming, mathematical abstractions can be visualised. Even, the utilisation of unplugged and block-based programming tools, like as Scratch and Micro:bit, in educational settings has been recognised as a handy and accessible way of introducing programming concepts to pupils in primary schools. Hence, to equip future generations with experience in coding, mathematics teachers in primary schools should be exposed to these skills.

Even though the technology could simplify and expedite certain tasks, the use of technology must still be evaluated in light of its needs and requirements. It is significant to recognise that the needs of a particular population for an innovative improvement are subject to continual evolution. In turn, it is imperative to ascertain the disparity between the current state and the intended state before commencing the investigation (Siraj et al., 2021). Serving as the primary agents responsible for a novel policy or intervention, teachers possess a crucial role in the execution of that implementation. Thus, it is necessary to investigate teachers' perceptions of the needs and requirements to use programming in their classrooms. The teacher's enthusiasm to execute an intervention holds significant importance in guaranteeing the attainment of the intervention's purpose. The Extended Unified Theory of Acceptance and Use of Technology (UTAUT2) is an integrated investigation of eight technology acceptance use models incorporating enhancements to the initial iteration of UTAUT. The models are the Reasoned Action Theory, Technology Acceptance Model (TAM), Motivational model, Theory of Planned Behavior (TPB), Combined TAM and TPB, Personal Computer Utilization model, Innovation Diffusion Theory, and Social Cognitive Theory (Pagé et al., 2023). This theoretical framework emphasizes four key factors: performance expectancy, effort expectancy, social influence, and facilitating conditions (Venkatesh et al., 2003). These factors are known to have a significant impact on individuals' behavioural intentions towards adopting and utilising a particular technology. In UTAUT2, the inclusion of hedonic motivation, price value, and habit represents an enhancement to the model's components (Venkatesh et al., 2012). Nadal et al., (2019) define technology acceptance as user satisfaction, responses obtained, practicality of a system, user participation, or intent to use a system. Hence this questionnaire aims to provide a comprehensive synthesis of technology acceptance with a better understanding of the teacher's motivation for selecting a particular classroom technology.

Validity refers to the extent to which the data obtained is rational, defensible, and appropriate for comprehending a certain event, before drawing any conclusions based on the data (Cohen et al., 2018). In actuality, the sources of validity proof must be founded on the substance of the test, the sample responses, the internal structure of the test, the link between variables, or the impact of the test administration (Creswell & Guetterman, 2021). The purpose of conducting content validity in a study is to assess the accuracy of the adapted items by a panel of experts in the pertinent field. The goal is to verify that the questionnaire's content only encompasses the intended variables to be measured (Talib, 2013), as has been demonstrated in earlier studies on validity (Ramli et al., 2023; Zaipul Bahari & Saleh, 2023).

The primary purpose of this research was to validate the adaptation of the UTAUT2 questionnaire in the programming module context and translate it into Malay. In addition, a content validity test was conducted to ensure that each item addressed each research question. This study will specifically address these research questions:

a) Does the UTAUT2 questionnaire exhibit semantic equivalence in its translated Malay version compared to the original version?

b) Is the UTAUT2 questionnaire appropriately assessing the degree of acceptability among mathematics teachers towards programming usage in their teaching practice?

METHODS

Process Overview

While there are countless questionnaires available, it is necessary to tailor each questionnaire that is chosen, modified, or newly constructed to suit the specific setting of the study. This study employed the questionnaire construction and translation paradigm proposed by Tsang et al., (2017). According to Tsang's model, the drafting of a questionnaire involves three phases: preliminary consideration, translation process, and validation process. Figure 1 illustrates the questionnaire construction and translation process.



Figure 1: The Questionnaire Construction and Translation Process

Phase 1 – The Preliminary Consideration

This phase has identified the UTAUT2 questionnaire as an adequate instrument for assessing the level of technology acceptance. It is required to translate this questionnaire from English to Malay and make necessary alterations. The alteration is imperative to guarantee the precision of the wording, content, and purpose of the items in this survey effectively addressing the research questions. Following the completion of the review process, a total of 30 items were chosen from the demographic section and six dimensions of the UTAUT2 questionnaire.

Phase 2 – The Translation Process

In the second phase, the translation process comprises three parts; specifically the appointment of an expert committee, the execution of forward translation, and the subsequent execution of backward translation. The beginning of this procedure entails the careful selection of the experts who will be involved. As a result, a group of four translators with advanced academic credentials, specifically a minimum of a master's degree or its equivalent in English language studies, and extensive professional experience exceeding a decade in the relevant field, has been chosen. The experts in question have been assigned the designations F1, F2, B1, and B2. The translators chosen for this task have expertise in cultural aspects of primary education and are well-knowledgeable in the field of English language study.

Expert	Service Period (years)	Institution	Field of Expertice
F1	25	Secondary School	TESOL, TESL
F2	27	Institute of Teacher Education	TESL
B1	13	Public University	TESOL, Education
B2	11	Primary School	TESL, Education

 Table 1: The Translators Professional Background

Table 1 outlines the translator's professional background. These professionals are tasked with the responsibility of guaranteeing consistency, identifying sentence defects, using cohesive language, and detecting any contradictions in the interpretation.



Figure 2: The Translation Process

This translation process utilised the back translation approach developed by Brislin (1970) for crosscultural research. The UTAUT2 questionnaire underwent a translation procedure consisting of seven stages for the development of its original instrument. Figure 2 outlines the translation process in this study. The first stage commenced with the translation of each questionnaire item from English to Malay by two expert translators, F1 and F2. The translated questionnaire underwent a process of synthesis by a neutral panel reviewer. The outcome of the initial iteration is documented as version one. Upon completion, step three encompassed the process of back translation, wherein version one was translated from Malay to English by translators B1 and B2. The translated version one underwent synthesis by an additional neutral panel reviewer in stage four and came out with the version two report. A preliminary assessment was conducted to evaluate responses and revise the questionnaire's language to make it simple to comprehend and pertinent to the study's context. These responses were necessary to ensure that the translated version conveys the same meaning as the original document and to prevent any potential confusion (Best & Kahn, 2006). During this sixth stage, two expert committee members analysed all responses and revised all items of both versions to reach a consensus. The reached agreement is included in the final version. This committee of experts is knowledgeable in mathematics education and methodology. Simultaneously, this phase has attained face validity for the instrument. This is because the translation process verifies that the language, syntax, and word choice of the items in the translated questionnaire have been assessed (Thorndike et al., 1997).

Phase 3: Validation Process

This phase encompasses content experts' evaluation of content items reviewed from the perspectives of competence, issues, or quality being measured by the instrument (Fink, 2017; Saunders et al., 2009). These experts know a range of disciplines, encompassing mathematical education, mixed-method research, early childhood education, and curriculum development. Indeed, these professionals must possess a doctoral degree or an equivalent academic certification, together with a minimum of five years of practical experience within their respective areas of specialisation. The invitation to participate in the study was extended to all experts by email. Once reaching a consensus, the instrument was disseminated to the experts using email. The evaluation requires a two-week timeframe. Thus, the experts were responsible for assessing the quality of each item and categorising them as either "very essential," "essential," or "not essential". Table 2 outlines all the expert's professional background for this phase. Eight experts were contributing to this process and labelled as FIE1, FIE2, FIE3, FIE4, FIE5, FIE6, FIE7, and FIE8. After the completion of the evaluation process, the gathered findings are afterwards collected and assessed utilising the Content Validity Ratio (CVR). The acceptance or rejection of each item is contingent upon the statistical analysis of the mean CVR value as assessed by each respective expert (Wilson et al., 2012). The CVR was determined using Lawshe's CVR equation (Lawshe, 1975).

$$CVR = \frac{n_e - \frac{N}{2}}{\frac{N}{2}}$$

Where, n_e is the quantity of experts who provide "very essential" to the item and N is the total of the experts. The CVR value ranges from 0 to 1. If all experts concur that an item is "very essential," then the CVR value is 1, whereas if there is disagreement among experts, the CVR value will fall between 0 and 0.99. For an item to be accepted when eight experts are involved, each CVR must reach 0.75 (Lawshe, 1975).

Expert	Service Period (years)	Institution	Field of Expertice
FIE1	18	Public University (UPSI)	Mathemetics, STEM Education
FIE2	29	Institute of Teacher Education (IPG KDA)	Mathematics Education, Curriculum, Mix-Method Research
FIE3	11	Public University (USM)	Mathematics
FIE4	28	Institute of Teacher Education (IPG KSAH)	Early Childhood Development, Mix- Method Research, Assessment and Evaluation
FIE5	20	Public University (UPSI)	Mathematics, STEM Education
FIE6	5	Public University (UTM)	Mathematics Education
FIE7	8	Private University (Sunway University)	Education, Mathematics
FIE8	5	Public University (USM)	Mathematics

Table 2: Validation Experts Professional Background

RESULTS

A. Phase 1 and 2 - The Preliminary Consideration and Translation Process

Preliminary consideration chose to use the UTAUT2 questionnaire with a focus on 6 dimensions namely performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, and behavioural intention. These items assess the factors influencing the study sample's adoption of a programming instructional module in their classroom. These 6 dimensions and demographic yield 21 items and nine items for each section. Bringing the total number of questions to thirty.

Both experts concurred on the forward translation's initial draught. F1 states "translation fulfils the intended meaning perfectly". Translations of all items are therefore accepted. Regarding the second version of the backward translation, B1 and B2 have a minor disagreement over some word choices, such as the use of "boring" or "tedious." In turn, two assessors have discussed and reviewed the most suitable words to employ. A consensus has finally been reached, and the Malay version of the UTAUT2 questionnaire is presently available for use.

B. Phase 3 – Validation Process

Translation, language adjustment, and compatibility of each item are tailored to meet the target of the study sample. Eight experts in the field evaluated the questionnaire. Table 3 displays the outcomes of the third phase. Experts categorise each item as VE: very essential, E: essential, or N: not essential. The answers were recorded and the CVR values were calculated. If the CVR value is greater than 0.75, the item will be accepted. Conversely, if the CVR is lower than 0.74, the item is rejected.

Item	FIE	FIE	FIE	FIE	FIE	FIE	FIE	FIE	CV	Remark
S	1	2	3	4	5	6	7	8	R	
Demog	raphic									
1	VE	VE	VE	VE	VE	VE	VE	VE	1	ACCEP T
2	VE	VE	VE	VE	VE	VE	VE	VE	1	ACCEP T
3	VE	VE	Е	VE	VE	VE	VE	VE	0.75	ACCEP
4	VE	VE	VE	VE	VE	VE	VE	VE	1	ACCEP
5	VE	VE	VE	VE	VE	VE	VE	VE	1	ACCEP T
6	VE	VE	VE	VE	VE	VE	VE	VE	1	ACCEP T
7	VE	VE	VE	VE	VE	VE	VE	VE	1	ACCEP T
8	VE	VE	Е	Е	E	VE	VE	VE	0.25	REJEC T
9	VE	VE	VE	VE	VE	VE	VE	VE	1	ACCEP T
Dimens	sion: Per	formanc	e Expec	tancy						
10	VE	VE	VE	E	VE	VE	VE	VE	0.75	ACCEP T
11	VE	VE	VE	VE	VE	VE	VE	VE	1	ACCEP T
12	VE	VE	Е	VE	VE	VE	VE	VE	0.75	ACCEP

Table 3: The CVR for UTAUT2 Questionnaire in Malay Version

JURNAL PENDIDIKAN SAINS DAN MATEMATIK MALAYSIA VOL 13 NO 2 2023 / ISSN 2232-0393 / eISSN 2600-9307

13	VF	VF	VF	VF	VF	VF	VF	VF	1	T ACCEP
Dimor	v L	ort Fyne	etonev	٧L	٧L	VL	VL	۷L	1	Τ
14	ISIOII. LIII	VE		VE	VE	VE	VE	VE	1	ACCEP
14	VE	٧E	VE	VE	VE	VE	VE	VE	1	T
15	VE	VE	VE	VE	VE	VE	VE	VE	1	ACCEP T
16	VE	VE	VE	VE	VE	VE	VE	VE	1	ACCEP T
17	VE	VE	VE	VE	VE	VE	VE	VE	1	ACCEP T
Dimer	nsion: Soc	ial Influ	ence							_
18	VE	VE	Е	VE	VE	VE	VE	VE	0.75	ACCEP T
19	VE	VE	Е	VE	VE	VE	VE	VE	0.75	ACCEP T
20	VE	VE	VE	VE	VE	VE	VE	VE	1	ACCEP T
Dimension: Facilitating Conditions										
21	VE	VE	VE	VE	VE	VE	VE	VE	1	ACCEP
22	VE	VE	VE	VE	VE	VE	VE	VE	1	ACCEP T
23	VE	VE	VE	VE	VE	VE	VE	VE	1	ACCEP
24	VE	VE	VE	VE	VE	VE	VE	VE	1	ACCEP T
Dimer	nsion: Hee	donic M	otivation							L
25	VE	VE	VE	VE	VE	VE	VE	VE	1	ACCEP T
26	VE	VE	VE	VE	VE	VE	VE	VE	1	ACCEP T
27	VE	VE	Е	VE	VE	VE	VE	E	0.5	REJEC T
Dimer	nsion: Beł	navioral	Intentio	n						-
28	VE	VE	VE	VE	VE	VE	VE	VE	1	ACCEP T
29	VE	VE	VE	VE	VE	VE	VE	VE	1	ACCEP T
30	VE	VE	Е	VE	VE	VE	VE	E	0.5	REJEC T

27 out of 30 items were approved, while three were rejected. Item 8 from the demographic domain, item 27 from the hedonic motivation dimension, and item 30 from the behavioural intention dimension have been rejected. FIE3, FIE4, and FIE5 rejected item 8 because it was not rationally expressed to address the research question. Questions 27 and 30 were rejected because their scope was nearly identical to that of the other questions. A few experts have offered constructive criticism. FIE2 outlines the different terms with different meanings like "mathematics in technology" and "technology in mathematics." Additionally, he suggested that additional items be added so that the questions are more sustainable and adequately represent each specified dimension. Regarding FIE4, he requested that the scale used for the item be clarified so that the study sample is not confused. While E5 suggested that a question could be added regarding samples' major and minor areas of specialisation, and explicitly named the individuals or organisations that exert social influence on the study sample. The Malay

version of the UTAUT2 survey was finalised following a comprehensive review conducted by the experts participating in this quantitative research. Refer to Supplemental Appendix 1 for the final version that has been authorised.

DISCUSSION

Each phase is executed attentively by the established translation and validation procedures. Accordingly, it is possible to achieve expert consensus. The validity of the questionnaire can be attained when each item accurately and explicitly represents a dimension. Consequently, these items can ensure that the questionnaires developed for this study can measure and attain the intended objectives. As a consequence of the review panel's discussion and the experts' suggestions for improvement, this questionnaire has been modified in several ways. Among the improvements made are limiting each item to a single question, using the most precise language, standardising the term usage throughout the questionnaire, including footnotes that explain each term in detail so that the intended meaning can be understood, and providing suggestions for answering each item. With the enhancements and additional data provided, the utility and convenience of this questionnaire can be enhanced.

Strengths and Limitation

This study's strength rests in the three rigorous phases that were conducted according to predetermined guidelines. Even the participation of experts from various disciplines is sufficient to cross-check each item from multiple angles. The translation of the questionnaire into the target language, not only can it assist the study sample in better comprehending each item, but it can also be used by other Malay-speaking academics. However, considering the nature of the study, this questionnaire only emphasises six dimensions, whereas the full version of the UTAUT2 questionnaire has seven. There are even variants of UTAUT2 with additional items to chose.

CONCLUSION

The UTAUT2 was adapted to accommodate the Malay context. The translation process was conducted and reviwed by professional translators. It has been assessed that the original and translated versions of the questionnaire exhibit semantic equivalence. Items within each dimension has been validated by specialists from a variety of disciplines. In addition, it has validated that the items accurately measures the degree to which mathematics teachers embrace the use of programming in their teaching practice. Since each component of this instrument has been validated and endorsed by experts, the results adequately address both research questions. Meanwhile, this instrument satisfies the criteria for face validity and content validity. For further study, the test's reliability may be examined. Nevertheless, a qualitative study can also continue with in-depth investigation of primary school mathematics teachers and pupils perspectives on the implementation of programming in the classroom context.

REFERENCES

- Best, J. W., & Kahn, J. V. (2006). *Research in Education* (A. E. Burvikovs, Ed.; Tenth). Pearson Education Inc.
- Brislin, R. W. (1970). Back-translation for Cross-Cultural Research. *Journal of Cross-Cultural Psychology*, *1*(3), 185–216.

Cohen, L., Manion, L., & Morrison, K. (2018). Research Methods in Education (Eighth). RoutledgeFalmer.

Creswell, J. W., & Guetterman, T. C. (2021). *Education Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research* (Sixth). Pearson Education Limited.

- Holo, O. E., Kveim, E. N., Lysne, M. S., Taraldsen, L. H., & Haara, F. O. (2022). A review of research on teaching of computer programming in primary school mathematics: moving towards sustainable classroom action. *Education Inquiry*, 00(00), 1–16. https://doi.org/10.1080/20004508.2022.2072575
- Lawshe, C. H. (1975). A Quantitative Approach To Content Validity. *Personnel Psychology*, 28(4), 563–575. https://doi.org/10.1111/j.1744-6570.1975.tb01393.x
- Nadal, C., Sas, C., & Doherty, G. (2019). Technology acceptability, acceptanceand adoption definitions and measurement. *Conference on Human Factors in Computing Systems*, 1–6. https://www.researchgate.net/publication/331787774_Technology_acceptability_acceptance_and _adoption_-_definitions_and_measurement
- Pagé, I., Roos, M., Collin, O., Lynch, S. D., Lamontagne, M.-E., Massé-Alarie, H., & K. Blanchette, A. (2023). UTAUT2-based questionnaire: cross-cultural adaptation to Canadian French. *Disability* and Rehabilitation, 45(4), 709–716. https://doi.org/10.1080/09638288.2022.2037746
- Ramli, M. S., Shafie, S., & Nasir, N. (2023). The Validityof Teaching and Learning Module Integrated Challenge-Based Learning Methods in Topic Consumer Mathematics. *Jurnal Pendidikan Sains Dan Matematik Malaysia*, 13(1), 1–7.
- Siraj, S., Abdullah, M. R. T. L., & Rozkee, R. M. (2021). *Pendekatan Penyelidikan Rekabentuk Dan Pembangunan* (Kedua). Universiti Pendidikan Sultan Idris.
- Talib, O. (2013). Asas Penulisan Tesis PEnyelidikan & Statistik (Pertama). Penerbit Universiti Putra Malaysia 2013.
- Thorndike, R. M., Cunningham, G. K., Thorndike, R. L., & Hagen, E. P. (1997). *Measurement and evaluation in psychology and education* (Fifth). Macmillan Publishing Co, Inc.
- Tsang, S., Royse, C. F., & Terkawi, A. S. (2017). Guidelines for developing, translating, and validating a questionnaire in perioperative and pain medicine. *Saudi Journal of Anaesthesia*, 11(5), S80–S89. https://doi.org/10.4103/sja.SJA_203_17
- Venkatesh, Thong, & Xu. (2012). Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. *MIS Quarterly*, 36(1), 157. https://doi.org/10.2307/41410412
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 425–478.
- Wilson, F. R., Pan, W., & Schumsky, D. A. (2012). Recalculation of the Critical Values for Lawshe's Content Validity Ratio. *Measurement and Evaluation in Counseling and Development*, 45(3), 197– 210. https://doi.org/10.1177/0748175612440286
- Zaipul Bahari, F. A., & Saleh, S. (2023). Content Validation Procedure: Development of Problem-solving Skills Test (PSST). Jurnal Pendidikan Sains Dan Matematik Malaysia, 13(1), 1–9. https://doi.org/doi.org/10.37134/jpsmm.vol13.1.1.2023

SUPPLEMENTAL APPENDIX 1

Soal Selidik UTAUT2 Untuk Tahap Penerimaan Modul Pengajaran Pengaturcaraan

Soal Selidik ini mengandungi 2 Bahagian A dan B. Bahagian A: Demografi

Sila tandakan (/) pada ruangan yang sesuai.

1.	Jantina	Lelaki	Perempuan
2.	Umur	Bawah 25 tahun 31 – 35 tahun 46 tahun	26 – 30 tahun 36 – 45 tahun
3.	Kelayakan akademik	Diploma atau setaraf Sarjana muda atau setaraf Sarjana atau setaraf Kedoktoran atau setaraf	
4.	Pengalaman mengajar	Kurang 2 tahun 11 – 20 tahun	3 – 10 tahun Lebih 20 tahun
5.	Kekerapan pengajaran menggunakan teknol	ogi	
		Setiap hari	2 – 3 kali seminggu
		Sekali seminggu	2 – 3 kali sebulan
		Sekali sebulan	Tidak pernah
6.	Tahap keyakinan mengajar menggunakan te	knologi	
		Sangat baik	Baik
		Sederhana	Rendah
		Sangat rendah	Tiada keyakinan
7.	Tahap kemahiran menggunakan pengaturcar	raan	
		Sangat baik	Baik
		Sederhana	Rendah
		Sangat rendah	Tiada keyakinan
8.	Cabaran yang dihadapi oleh guru dalam mer kelas. (Anda boleh memilih lebih daripada s Sumber yang terhad (fasi	nggunakan teknologi dalam aktiviti p atu jawapan) liti sekolah, juruteknik, latihan, dll).	bembelajaran di dalam

Murid kurang mempunyai kemahiran asas komputer. Murid mudah terganggu apabila menggunakan alatan teknologi. Pengetahuan mengenai teknologi yang terhad. Isu pengurusan masa (beban kerja guru, peruntukan masa terhad). Kekurangan alatan ICT peribadi (internet, komputer riba, dll). Tidak berminat dengan teknologi.

Bahagian B: Konstruk Unified Theory of Acceptance and Use of Technology (UTAUT2). Sila terangkan jangkaan anda dan ramalkan faktor yang mempengaruhi niat tingkah laku murid terhadap penggunaan pengaturcaraan dalam pengajaran anda

Sila nyatakan tahap persetujuan dengan penyataan di bawah berdasarkan skala Likert 7 mata dengan 1 = Sangat Tidak Setuju (STS) dan 7 = Sangat Setuju (SS)

Kod	Item		Ta	hap	Per	setu	juar	1
	Jangkaan Prestasi						•	
PE1	Saya mendapati pengaturcaraan berguna untuk pengajaran matematik saya.	1	2	3	4	5	6	7
PE2	Menggunakan pengaturcaraan dalam pengajaran matematik membantu pengajaran saya dengan lebih berkesan.	1	2	3	4	5	6	7
PE3	Menggunakan pengaturcaraan dalam pengajaran matematik membantu pengajaran saya dengan lebih berkesan.	1	2	3	4	5	6	7
PE3	Menggunakan pengaturcaraan meningkatkan prestasi murid saya dalam matematik.	1	2	3	4	5	6	7
	Jangkaan Usaha							
EE1	Belajar menggunakan pengaturcaraan adalah mudah untuk saya.	1	2	3	4	5	6	7
EE2	Interaksi saya dengan pengaturcaraan adalah jelas dan difahami.	1	2	3	4	5	6	7
EE3	Saya mendapati pengaturcaraan susan untuk digunakan.	1	2	3	4	5 5	6	7
	anya madan antak saya menjadi mami mengganakan pengatarearaan.	1	2	5	•	5	0	,
CC 1	Pengaruh Sosial	1	2	2	1	5	6	7
221	orang yang mempengarum ungkan laku saya merasakan saya narus menggunakan pengaturcaraan	1	Ζ	3	4	3	0	/
SS2	Orang yang penting pada saya merasakan saya harus menggunakan	1	2	3	4	5	6	7
	pengaturcaraan.							
SS3	Orang yang saya hargai pendapatnya lebih suka saya menggunakan pengaturcaraan.	1	2	3	4	5	6	7
	Keadaan Fasiliti	1	2	3	4	5	6	7
FC1	Saya mempunyai sumber yang diperlukan untuk menggunakan pengaturcaraan.	1	2	3	4	5	6	7
FC2	Saya mempunyai pengetahuan yang diperlukan untuk menggunakan pengaturcaraan.	1	2	3	4	5	6	7
FC3	Pengaturcaraan sesuai dengan teknologi lain yang saya gunakan.	1	2	3	4	5	6	7
FC4	Saya boleh mendapatkan bantuan daripada orang lain apabila saya menghadapi masalah menggunakan pengaturcaraan.	1	2	3	4	5	6	7
	Motivasi Keseronokkan							
HM1	Menggunakan pengaturcaraan adalah menyeronokkan.	1	2	3	4	5	6	7
HM2	Menggunakan pengaturcaraan adalah menghiburkan.	1	2	3	4	5	6	7
RI1	Niat Tingkah Laku Saya berbarat untuk terus menggunakan pengaturgaraan pada masa	1	2	3	4	5	6	7
	hadapan.	1	2	5	4	ر ب	0	7
BI2	Saya akan sentiasa cuba menggunakan pengaturcaraan dalam pengajaran harian saya.	1	2	5	4	5	6	/