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Development of geography alternative assessment module for Malaysia secondary school

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Abstract

This study aimed to develop an Alternative Assessment Module, evaluate the validity of its contents, and test its applicability in the teaching and learning sessions of Geography teachers in Malaysia for Form One topics. The Design and Development Research (DDR) approach was used to develope the module, complimented by a survey to elicit feedback on its content validity and applicability among Form One Geography teachers. The needs analysis involved interviews and document analysis to design a draft of the Alternative Assessment Module. The interview method included three Geography teachers with over ten years of teaching experience, while the document analysis method focused on Form One's Geography Standard Document for Curriculum and Assessment (DSKP) and the Classroom Assessment Handbook. A survey was conducted using a purposive sampling method, involving five experts from various fields to assess the module's validity and six Geography teachers from three schools in the Hulu Selangor district in Selangor to evaluate its applicability. The study findings indicated that the module's content validity, as measured by the coefficient value, was 0.85. Additionally, the module's applicability in teaching was found to be high in terms of effectiveness (M = 4.7, SD = 0.21), efficiency (M = 4.2, SD= 0.34), and satisfaction (M = 4.7, SD = 0.23). The study concluded that the Alternative Assessment Module can be effectively used as one of the teaching resources for Classroom Assessment. The implications of this study highlight the focus on teachers' achievement of learning objectives for the topic of drainage in Malaysia using the Alternative Assessment Module.

Keywords: Assessment module, alternative assessment, classroom assessment, geography

Introduction

Assessment is a vital element of any educational system. Assessment is an activity that collects, interprets, and uses information to help teachers make decisions (Nurul Akmar, 2020). The assessment conducted in the classroom also aims to gather feedback on students' development, progress, abilities, and achievements (Ministry of Education Malaysia, 2019). Along with the development and advancement of technology, the country's education field is transforming. The

national education system is transitioning from an examination-oriented assessment system to a holistic student-oriented assessment system through the 2013–2025 Malaysian Education Development Plan (Ministry of Education Malaysia, 2013). The mentioned transformation included the abolition of the Penilaian Menengah Rendah (commonly abbreviated to PMR; Malay for Lower Secondary Assessment) in 2012 and replacing it with School-Based Assessment (PBS). PBS includes three main components which are Classroom Assessment (PBD), Physical Activity, Sports and Co-curricular Assessment (PAJSK) and Psychometric Assessment (PPsi). Teaching method must change along with the generational change in the world of education so that it in line with current needs and future needs (Nazariah & Abdul, 2021).

PBD, one of the components of PBS, is an alternative assessment method that has begun to be implemented in the national assessment system. The transition from conventional assessment, which primarily employs pencil and paper, to alternative assessment emphasizes student development more (Fara & Siti, 2021). PBD is also a form of alternative assessment that is used during the teaching and learning process. This assessment includes a continuous, transparent, standard implementation process to assess students' abilities and development (Mohd Haidzir & Norasmah, 2019). Alternative assessment also allows students to explore their skills and abilities without relying on the conventional assessment teachers perform in the classroom.

Geography learning encourages students to explore the diversity and scope of life on earth. However, the Physical Geography components, which include dynamic science elements, quickly bore students (Nor Shahila & Fariza, 2021). Therefore, the implemented assessment method should not be conventional but rather varied to pique students' interest in continuing to learn. Hence, this study was conducted to develop an Alternative Assessment Module that can assist teachers in implementing PBD in the classroom through oral, written, and observational assessment methods. As students are already familiar with the state of Malaysian rivers, this module development involved applying Constructivism Theory to drainage in Malaysia. Before obtaining validation from experts in the module and assessment section, a requirement study was conducted to develop this assessment module. Following that, the Alternative Assessment Module's applicability was tested to determine how far this module can be used in assessing students' performance, particularly with the use of alternative assessment.

Literature review

In general, assessment can be defined as a tool for measuring students' levels of achievement and true potential during the teaching and learning process occurring in the classroom (Hanifah et al, 2021). Previously, the national education system utilized a conventional pencil-and-paper assessment system (Dikli, 2003; Nurul Akmar, 2020; Reyes & Charlene, 2019; Tan & Ng, 2018). However, Daniel (2019) and Rohaya et al. (2014) did not concur on whether the conventional assessment system is still used to measure students' abilities and development. Daniel (2019) stated that conventional assessment only measures students' cognitive performance. In contrast, Rohaya et al. (2014) stated that a conventional assessment is a numerical assessment in which students' abilities are only measured by the scores obtained from the assessment. The perspective of Dikli (2013) encourages alternative assessment because it includes open-ended questions, exhibitions, demonstrations, experiments, computer simulations, and folios. This alternative assessment indirectly stimulates students' psychomotor, affective and cognitive knowledge and producing quality and competitive educators (Hanifah et al., 2015)

Furthermore, alternative assessment is a form of assessment that measures students' development holistically, which necessitates the participation of all students. Portfolios, group presentations, demonstrations, and other forms of alternative assessment are among those suggested by the Ministry of Education Malaysia (MOE) in the Classroom Assessment Implementation Guidebook (2019). This alternative assessment can reveal to students their critical thinking and outside-the-box thinking abilities (Deignan & Brown, 2016). Table 1 shows some other types of assessments that can be conducted.

Table 1. Examples of alternative assessments that can be conducted.

Types of assessment	Oral assessment	Written assessment	Observation assessment
Teaching and learning activities	• Questionnaire • Read aloud • Lecture • Debate • Storytelling • Discussion • Memory • Interviews • Singing • Poetry recital • Listen and respond	• Essay • Project report • Coursework experiments • Portfolio • Written exercises • Written test • Description and interpretation of statistics, maps, tables, graphs, or charts	• Attitude • Treatment/practice • Practice • Manipulative skills • Social skills • Study skills • Kinesthetic skills • Computer literacy skills • The skills they create

Source: Ministry of Education Malaysia, 2019

Several previous studies have also shown that incorporating Constructivism Theory into classroom teaching and learning can enhance students' comprehension of a learning topic. The studies of Alnusra and Suaema (2019) applied the Constructivist Learning Method in teaching and learning of landforms. According to the study's findings, after implementing the Constructivist Learning Method, the number of students scoring below 50% in the treatment group decreased significantly from nine to three. Furthermore, Ambotang et al. (2011) applied Constructivist Learning Theory to the teaching and learning the Form One drainage topic in Malaysia by employing the River Design Model. The treatment group that utilized the River Design Model in the teaching and learning process demonstrated a 33% increase in scores on the post-test. The mean difference compared to the control group was 13%. The results of these two studies indicated that applying the Constructivism Learning Theory, which teaches students to explore and generalize knowledge based on personal experience, also increased students' thinking abilities.

Method and study area

This study consisted of two phases of study implementation. The first phase, the Alternative Assessment Module development phase, included Design and Development Research (DDR). The second phase of the study was the module testing phase of the teacher's teaching session involving the design of a survey study. Design and development studies entail analyzing, designing, developing, and implementing continuously produced products (Jaya et al., 2021). This study used Sidek's Module Construction Model (2005) to develop an Alternative Assessment Module.

Sidek's (2005) module construction procedure simplifies things for users by having two stages: the module construction stage and the module trial and testing stages (Sidek & Jamaludin, 2005). As a result, this study included two major phases in the module's development: the draft phase of the Alternative Assessment Module and the complete Alternative Assessment Module.

The development phase of the Alternative Assessment Module draft used a qualitative method that included an analysis of the Form One Geography Standard Document for Curriculum and Assessment (DSKP) and the Classroom Assessment Handbook. Guidelines, procedures, and evaluation methods applied to implementing PBD were analyzed. The information gathered was then aligned with the situation in the field. Semi-structured interviews were conducted with three Geography teachers with more than ten years of experience in education and different option backgrounds. Teachers' perspectives on classroom PBD knowledge, planning, and execution were gathered through interviews. The three teachers' option criteria and varied service periods were used to determine their divergent perspectives on these three matters. The findings of the document analysis and interviews were then used to create requirements for the Alternative Assessment Module.

Subsequently, five experts from various expertise backgrounds were chosen to validate the draft of the Alternative Assessment Module developed to determine its validity. Four experts were Sultan Idris Education University lecturers with expertise in the Malaysian module and curriculum development. Another expert was an outstanding Geography teacher at a secondary school in Pahang. The five experts were provided with a draft of the Alternative Assessment Module and a questionnaire regarding its validity.

The questionnaire created to assess the validity of the module consisted of three main sections: part A related to the module's content, part B to its instructional design, and part C to its technical requirements. This module's validity questionnaire was adapted from Sidek and Jamaluddin (2005) and Siti Nabilah (2019). This questionnaire was analyzed using a five-point Likert scale with a score ranging from one to five, where 1 = strongly disagree, 2 = disagree, 3 = less agree, 4 = agree, and 5 = strongly agree. The content validity value of the Alternative Assessment Module had to exceed 70% with a coefficient value of 0.70, as suggested by Sidek and Jamaluddin (2005).

Next, the draft of the Alternative Assessment Module, whose content had been verified by five experts, was then tested for its applicability to the teaching and learning of Form One Geography teachers. The study respondents were chosen using a purposive sampling method, with the study area limited to three residences in the district of Hulu Selangor, in the state of Selangor. Three schools, namely Sekolah Kebangsaan Kampung Seoharto, Sekolah Menengah Kebangsaan Kalumpang, and Sekolah Menengah Kebangsaan Sungai Buaya, were associated with the three residences of Hulu Bernam, Kalumpang and Serendah. The study on the applicability of the Alternative Assessment Module also included six Geography teachers from three related schools.

The questionnaire on the applicability of the Alternative Assessment Module was divided into three main parts, with part A of respondents' demographic information such as gender, age, teaching experience, and teaching options. Part B included items related to the level of the module's effectiveness in terms of its format and contents. Part C also contained module efficiency items related to the accessibility of learning objectives, assessment feasibility, and the effectiveness of teaching aids. Finally, part D concerned the level of satisfaction with the module's use in terms of students' interest and teachers' ease of use. The module's applicability questionnaire was adapted from the applicability of the questionnaire model, which was the Usefulness, Satisfaction, and Ease of Use (USE) by Arnie Lund (2001) and studies by Faria et al.

(2016), Ismail (2018) and Norhaida (2019). Similar to the questionnaire concerning the module's content validity, this questionnaire concerning the module's applicability also used five-point Likert scales consisting of a scale of strongly agree (5), agree (4), uncertain (3), disagree (2), and strongly disagree (1). The analysis was then conducted using mean score interpretation. The study implementation procedure is summarised as shown in Figure 1.

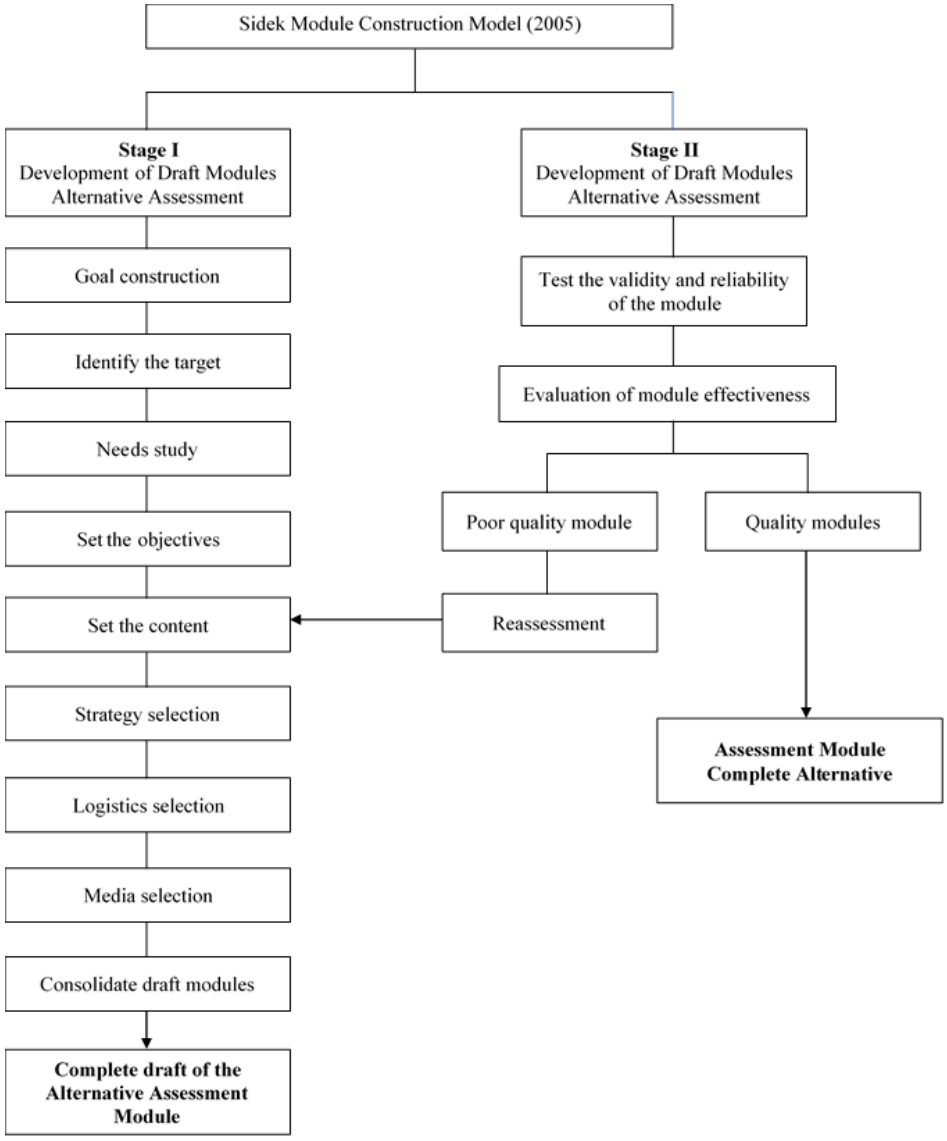

Figure 1. Procedures of the Alternative Assessment Module testing and development

Results and discussion

Before developing the Alternative Assessment Module, three Geography teachers were consulted to determine the frequently used assessment activities to implement teaching and learning. According to the interview results, teachers believed that the most common assessment activities were presentations, model building, and assessment using i-think maps. All three teachers stated

that they employed all three-assessment methods: written, oral, and observational. As a result, the Alternative Assessment Module included this information. The development of the Alternative Assessment Module involved nine primary procedures: goal building, target identification, requirement study, objective setting, content selection, strategy, logistics, media, and the module's draft consolidation. Table 2 shows the draft of the module's content that was developed.

Table 2. Contents of the Alternative Assessment Module.

Module content	
• Module Background	• Lesson Plan
• Module Objectives	• Teaching aids
• Module Objectives	• Assessment Form
• Module Implementation Guide	• Assessment Rubric
• Activity 1: Phyriv Model Construction	• Worksheet
• Activity 2: Sketch Rivers on the Map of Malaysia	• Schematic worksheet
• Activity 3: I-Think Map	

Table 2 depicts the draft of the Alternative Assessment Module developed using the nine-module development procedures proposed by Sidek and Jamaluddin (2005). The assessment activities contained in the module included the Phyriv model building activities, river sketching activities on the Malaysian map, and i-think map activities. These proposed assessment activities corresponded with information obtained from interviews with Geography teachers about the planning and implementation of PBD. These assessment activities were cited in previous studies such as Ambotang et al. (2011), Mas Norbany (2016), and Azlili (2018). The assessments involved all three-assessment methods: oral assessment, writing, and observation. The suggested teaching aids, forms, and assessment rubrics were provided to help teachers conduct assessments with only one module.

Following that, the draft of this Alternative Assessment Module was submitted to five appointed experts in module development and the education curriculum. The module's content validity was required to determine the extent to which the measurement tool used could cover the content of the field under study (Mohd Majid, 1998). Therefore, the validity results provided by these five experts were more significant than 70%, with a coefficient value of 0.7, as proposed by Sidek and Jamaluddin (2005). Table 3 shows the evaluation results of content validity from the five experts. The entirety of the module was evaluated, including its content, instructional design, and technical requirements. Table 4 displays the overall validity values of the experts.

According to Table 3, the average expert gave a percentage value of more than 80%. Each module expert, Expert 1, and Expert 2, provided the lowest percentage value of 81%. The two curriculum education experts, Expert 3 and Expert 4 gave the highest percentage values of 87% and 89%, respectively. Expert 4, an outstanding Geography teacher, gave a percentage of 85%.

According to Table 4, most experts gave a positive response greater than 0.8. The instructional design part yielded the lowest percentage value of 83% (coefficient value of 0.83), while the module content part yielded the highest percentage value of 87% (coefficient value of 0.87). Furthermore, the total validity obtained from these five experts for technical requirements involving the front page, font type and size, and graphics used in the module was 85%, with a coefficient of 0.85. The experts agreed that the developed Alternative Assessment Module was appropriate for use in the teaching and learning of drainage in Malaysia. In this case, the production of a module must be centered on the intended users.

Table 3. Values of the Alternative Assessment Module's content validity by experts.

Expert	Total Expert	Percentage (%)	Coefficient value	Expert opinion
1	61	81	0.81	Accepted
2	61	81	0.81	Accepted
3	65	87	0.87	Accepted
4	67	89	0.89	Accepted
5	64	85	0.85	Accepted
	Overall	**85**	**0.85**	**Accepted**

Table 4. Overall content validity values of the Alternative Assessment Module.

No.	Statement	Percentage (%)	Coefficient value	Expert opinion
1	Module content	87	0.87	Accepted
2	Teaching design	83	0.83	Accepted
3	Technical requirements	85	0.85	Accepted
	Overall	**85**	**0.85**	**Accepted**

Previous research, specifically project-based learning on the topic of recycling by Chong and Mohammad Tahir (2021) for Form Three students, also demonstrated a positive effect. This result was due to the post-test results, which revealed that students receiving F grades had decreased from 30 to 6. Similarly, Ambotang et al. (2011) applied Constructivist Learning Theory in the River Design Model to the teaching and learning of drainage in Malaysia. The post-test revealed a 33% increase in students' mastery of the topic. This finding demonstrates that if a lesson focuses on the intended group, its implementation will be more straightforward, and learning outcomes will be achieved.

Six Geography teachers were chosen from three schools in the Hulu Selangor district of Selangor to test the level of applicability of the Alternative Assessment Module. Four of the six teachers were female respondents, while the other two were males. One respondent was between 26–30 years, four were between the ages of 31 and 35, and one teacher was above 36. In terms of teaching experience, the findings revealed that one teacher had 1–5 years of experience, while the other three teachers had 6–10 years of experience. Teachers with 11–15 years of experience and teachers with 16 years or more experience included only one teacher. Table 5 shows the percentage distribution of the respondents' profiles.

Table 5. Percentage distribution of respondents' profiles.

Category	Subcategory	Number	Percentage (%)
Gender	Men	2	33.3
	Women	4	66.7
	Total	6	100
Age	Under 25 years old	0	0
	26 to 30 years	1	16.7
	31 to 35 years old	4	66.7
	36 years and above	1	16.7
	Total	6	100
Teaching experience	1 to 5 years	1	16.7
	6 to 10 years	3	50

	11 to 15 years	1	16.7
	16 years and above	1	16.7
	Total	6	100
Position grade	DG42	1	16.7
	DG44	2	33.3
	DG48	3	50
	DG52	0	0
	DG54	0	0
	Total	6	100
Geographical options	Yes	4	66.7
	No	2	33.3
	Total	6	100

The Alternative Assessment Module's applicability level analysis included three main constructs: effectiveness, efficiency, and satisfaction with the module regarding the teaching and learning of Geography teachers in Malaysia on drainage. As shown in Table 6, the analysis using score interpretation had three levels: high, medium, and low.

Table 6. Levels of interpretation of study variable mean scores.

Level	Interpretation mean score
3.68 – 5.00	High
2.34 – 3.67	Medium
1.00 – 2.33	Low

Source: Best (1977)

Table 7. Levels of the Alternative Assessment Module' applicability.

Construct	Low Level		Medium Level		High Level		Mean	SD	Mean Level
	N	%	N	%	N	%			
Module effectiveness	0	0	0	0	6	100	4.7	0.21	High
Content of the module	0	0	0	0	6	100	4.6	0.27	High
Module format	0	0	0	0	6	100	4.7	0.24	High
Module efficiency	0	0	0	0	6	100	4.2	0.34	High
Accessibility of learning objectives	0	0	0	0	6	100	4.4	0.38	High
Appraisal feasibility	0	0	2	33.3	4	66.7	3.6	0.64	Medium
The effectiveness of teaching aids	0	0	0	0	6	100	4.5	0.21	High
Module satisfaction	0	0	0	0	6	100	4.7	0.23	High
Student interest	0	0	0	0	6	100	4.7	0.23	High
Teacher comfort	0	0	0	0	6	100	4.7	0.24	High

According to Table 7, the effectiveness of the Alternative Assessment Module in teaching and learning about drainage in Malaysia was high (M = 4.7, SD = 0.21). All six respondents rated the module's effectiveness highly (100%). Module effectiveness variables were classified as module content and module format. The effectiveness of module content (M = 4.6, SD = 0.27) was high, as was the effectiveness of module format (M = 4.7, SD = 0.24). According to the results for these two parts, all respondents (100%) agreed that this module was effectively implemented in Malaysia's teaching and learning sessions on drainage. Using relevant and effective teaching

methods can influence students' improved skills and comprehension of a learning topic (Nor Shahila & Fariza, 2021). Indeed, attractive graphics and appropriate colour selection can pique a user's interest in using a module (Norhaida, 2019; Hanifah et al., 2024).

Furthermore, in Malaysia, the average level of the efficiency variable of the Alternative Assessment Module in teaching and learning for drainage was high (M = 4.2, SD = 0.34). The module's efficiency variable was divided into three parts that covered the accessibility of the learning objectives, assessment feasibility, and the effectiveness of the teaching aids included in the Alternative Assessment Module. The accessibility part of the learning objectives showed a high level (M = 4.4, SD = 0.38), with all six respondents (100%) providing positive feedback. This finding showed that the main objective of developing a module that focused on the mastery of Form One students on drainage in Malaysia was successfully implemented. Sidek and Jamaluddin (2005) also emphasized the importance of focusing on the primary target of module users in order to achieve module objectives.

Furthermore, all respondents (100%) rated the effectiveness of the module's teaching aids as high (M = 4.5, SD = 0.21). This result differed from the assessment feasibility section, which received a moderate rating (M = 3.6, SD = 0.64). Four respondents (66.7%) rated the module-based assessment as highly feasible, while two (33.3%) rated it as moderately feasible. This result was because implementing PBD requires a long- and insufficient-time allocation to allow teachers to conduct assessment activities. According to Fara and Siti (2021), 114 teachers (18.4%) did not agree that the assessment could be completed in a reasonable amount of time. Hauzimah (2019) and Sincaroo et al. (2023), who found that the average teachers agreed they face time constraints when conducting PBD assessment activities, supports this statement. Teachers prefer conventional assessments over alternative assessments (Dikli, 2003).

Next, the effectiveness of the teaching aids was high (M = 4.5, SD = 0.21). The module satisfaction item received a high rating (M = 4.7, SD = 0.23), as did the student interest subitem (M = 4.7, SD = 0.23) and the teacher's ease in using the Alternative Assessment Module (M = 4.7, SD= 0.24). Teaching aids such as building models and i-think maps, which make extensive use of graphics, can be used to assess students' creativity (Zainiah & Juppri, 2016). Moreover, the application of twenty-first-century learning elements (PAK21) in the Alternative Assessment Module, as in the studies by Mas Norbany (2016) and Mohd Huzaimi et al. (2020), was mentioned as being beneficial for enhancing classroom teaching and learning.

Conclusion

Overall, the development of the assessment module required a comprehensive needs analysis to identify the primary requirements for implementing PBD (Pentaksiran Bilik Darjah) and assessment activities that align with twenty-first-century skills. Thus, the development of the Alternative Assessment Module was preceded by thorough requirements analysis and expert validation. According to the research, most respondents were satisfied with the PBD activities included in the module, as they align with twenty-first-century teaching and learning practices. In conclusion, this Alternative Assessment Module is appropriate for implementation during teaching and learning sessions for Form One Geography teachers in Malaysia, specifically on the topic of drainage. It is hoped that this study will serve as a model for other educational researchers.

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References

Alnusra, D. S., & Suaema, A. (2019). Penerapan metode Pembelajaran Konstruktivisme untuk meningkatkan hasil belajar Geografi pada materi bentuk-bentuk permukaan bumi untuk siswa Kelas Vii SMP Gotong Royong Tobelo [The application of the Constructivism learning method to improve the learning outcomes of Geography on the material of the earth's surface for Class VII students of SMP Gotong Royong Tobelo]. *Edukasi*, *17*(2), 122–136.

Ambotang, A., Mohamad, B., Salleh, M., & Francis, N. (2011). Keberkesanan penggunaan model bentuk muka bumi sungai bagi meningkatkan prestasi pelajar dalam Mata Pelajaran Geografi Tingkatan 1 [The effectiveness of using river landform models to improve student performance in Form 1 Geography Subjects]. National Seminar on History and Geography Education (pp. 1-12), 13-14 July, Universiti Malaysia Sabah, Kota Kinabalu, 1–12.

Azlili, M. (2018). Pembangunan Modul Peta Pemikiran i-Think bagi mata pelajaran Sains Tahun 5 [Development of the i-Think Mind Map Module for Year 5 Science subjects]. Universiti Pendidikan Sultan Idris.

Best, J. W. (1977). *Research in education*. Prentice-Hall.

Chong, O. M., & Mohammad Tahir, M. (2021). Pembelajaran berasaskan projek dalam mata pelajaran Geografi [Project-based learning in Geography subjects]. *Geografia-Malaysian Journal of Society and Space, 17*(1), 268–282.

Daniel, A. (2019). Traditional assessment procedures, and performance and portfolio assessment procedures: An in-depth comparison. *International Journal of Educational Research and Studies, 1*(2), 28–30.

Deignan, T., & Brown, S. (2016). Educator perspectives on the use of alternative assessment methods within taught masters programmes an exploratory study using activity theory and Q methodology. *Educational Review, 68*(4), 379–402.

Dikli, S. (2003). Assessment at a distance: Traditional vs. Alternative Assessments. The Turkish *Online Journal of Education Technology*, *2*(3), 13–19.

Fara, I., & Siti, R. (2021). Penilaian pelaksanaan Pentaksiran Bilik Darjah (PBD) dalam kalangan guru matematik sekolah rendah. [Evaluation of the implementation of Classroom Assessment (PBD) among primary school mathematics teachers]. *Jurnal Pendidikan Sains Dan Matematik Malaysia*, *11*(2), 81–94.

Faria, T. V. M., Pavanelli, M., & Bernardes, J. L. (2016). Evaluating the usability using USE questionnaire: Mindboard system use case. *Lecture Notes in Computer Science (Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), 9753*, 518–527.

Hanifah, M., Edlyn, A. S., Yazid, S., & Nasir, N. (2024). Comics as engaging tools for teaching geography. *International Journal of Learning, Teaching and Educational Research, 23*(10), 522-543.

Hanifah, M., Nurul Adila, A., Mohamadisa, H., Nasir, N., & Yazid, S. (2021). Pelaksanaan pentaksiran pembelajaran dan pemudahcaraan (PDPC) berdasarkan teknologi di sekolah [Implementation of learning assessment and facilitation (PDPC) based on technology in schools]. *E-Jurnal Penyelidikan dan Inovasi, 8*(1), 1-24.

Hanifah, M., Yazid, S. Mohmadisa, H., Norazlan, H. Y., Adnan, Y., & Ahmad, Y. K. (2015). Curriculum assessment in social sciences at Universiti Pendidikan Sultan Idris. *Journal of Education and Practice, 6*(22), 48-54.

Ismail, S. (2018). Pembinaan dan Pengujian Kebolehgunaan Modul Pengajaran Berasaskan Peta Pemikiran bagi Topik Nisbah, Kadar dan Kadaran [Construction and Usability Testing of a Mind Map-Based Teaching Module for the Topics of Ratios, Rates and Proportions] [Master's Dissertation, Universiti Pendidikan Sultan Idris].

Jaya, S., Zaharudin, R., Hashim, S. N. A., Ithnin, M. A., Zaid, S. M., Mapjabil, J., & Nordin, M. N. (2021). Employing Design and Development Research (DDR) Approach in Designing Next Generation Learning Spaces (NGLS) In Teachers' Pedagogy and Technology Tools. *Review of International Geographical Education Online, 11(*7), 1237–1246.

Kementerian Pendidikan Malaysia. (2013). Pelan pembangunan pendidikan Malaysia 2013-2025. [Malaysian Education Development Plan 2013-2025].

Kementerian Pendidikan Malaysia. (2019). Panduan Pelaksanaan Bilik Darjah edisi ke-2. Kementerian Pendidikan Malaysia.

Mas Norbany, A. S. (2016). Pembangunan dan penilaian Modul Pentaksiran Autentik dalam pengajaran dan pembelajaran matematik tahun satu bagi topik wang, masa dan waktu. [Development and evaluation of the Authentic Assessment Module in first year mathematics teaching and learning for the topic of money, time and time] [Doctoral dissertation, Universiti Pendidikan Sultan Idris].

Mohd Haidzir, Y., & Norasmah, O. (2019). Isu dan permasalahan pentaksiran alternatif dalam sistem penilaian di Malaysia; [Alternative assessment issues and problems in the assessment system in Malaysia]. E-Prosiding Persidangan Antarabangsa Sains Sosial Dan Kemanusiaan (pp. 337–350).

Mohd Huzaimi, A. M., Zolkepli, H., & Norasmah, O. (2020). Penilaian pelaksanaan program Pentaksiran Alternatif Sekolah Rendah (PASR) di sekolah rendah pendidikan khas integrasi. [Evaluation of the implementation of the Primary School Alternative Assessment (PASR) program in special integration primary schools]. *Jurnal Pendidikan Malaysia, 45*(1), 9–16.

Mohd Majid, K. (1998). *Kaedah penyelidikan pendidikan [Educational research methods]* (3rd ed.). Dewan Bahasa dan Pustaka.

Nazariah, M. I., & Abdul, R. R. (2021). Let's play the alphabet' kit increase special educations literacy skill in Bahasa Melayu. *Jurnal Pendidikan Bitara UPSI, 14*(2), 18-31.

Nor Shahila, I., & Fariza, K. (2021). Penggunaan video YouTube bagi meningkatkan minat dan pencapaian murid dalam Pembelajaran Geografi Fizikal di sekolah menengah' The use of YouTube videos to increase student interest and achievement in Physical Geography Learning in secondary schools]. *Malaysian Journal of Social Sciences and Humanities (MJSSH), 6*(3), 228–240.

Norhaida, A. B. (2019). Kebolehgunaan draf modul pandemik matematik tambahan tingkatan 4 bagi topik persamaan serentak, penyelesaian segi tiga dan sukatan membulat berdasarkan persepsi guru matematik tambahan. [The applicability of the 4th grade supplemental mathematics pandemic draft module for the topic of simultaneous equations, solving triangles and circular measurements based on the perception of supplemental mathematics teachers]. [Master's Dissertation, Universiti Pendidikan Sultan Idris].

Nurul Akmar, S. (2020). Pentaksiran alternatif: pentaksiran prestasi, autentik, portfolio, dan kaedah pelaksanaan pentaksiran prestasi. [Alternative assessment: performance assessment, authentic, portfolio, and performance assessment implementation methods]. *Sains Humanika, 12*(2–2), 51–55.

Reyes, V., & Charlene, T. (2019). Assessment reforms in high-performing education systems: Shanghai and Singapore. International Trends in Educational Assessment: Emerging Issues and Practices (pp. 25-39).

Rohaya, T., Hamimah, A. N., Nor Sahidah, M. A., & Mohd Aisamuddin, M. H. (2014). School-Based Assessment a Study on Teacher's Knowledge and Practices (pp. 1-7).

Sidek, M. N., & Jamaludin, A. (2005). *Pembinaan modul: bagaimana membina modul latihan dan modul akademik. [Module construction: how to build training modules and academic modules]* (1st ed.). Penerbit Universiti Putra Malaysia.

Sincaroo, B., Noemi, L, Afinah, A. D. M., Dayang, R. S. M. F., Donatus, J., Nuraziella, M. (2023). Pengaruh pengetahuan dan kemahiran terhadap sikap guru matematik sekolah rendah di Sabah dalam pentaksiran bilik darjah secara dalam talian [The influence of knowledge and skills on the at the attitudes of primary school mathematics teachers in Sabah in online classroom assessment]. *Jurnal Pendidikan Bitara UPSI*, *15*(1), 28-39.

Tan, C., & Ng, C. S. L. (2018). Assessment reform in Shanghai: issues and challenges. *International Journal of Educational Reform*, *27*(3), 291–309.

Zainiah, M. I., & Bacotang, J. (2016). Aplikasi Model Addie dalam pembangunan Modul Literasi Awal (Modul Lit-A) untuk awal kanak-kanak. [Application of the Addie Model in the development of the Early Literacy Module (Lit-A Module) for early childhood] (pp. 1-10).