



The Application Of Stem To The Brebes Local Wisdom-Based Mathematics Textbook

Martyana Prihaswati¹ Venissa Dian Mawarsari^{2,*} Eko Andy Purnomo³ Mazlini Adnan⁴
Uswatun Khasanah⁵

^{1,2,3}*Universitas Muhammadiyah Semarang, Semarang Central Java 50273, Indonesia*

^{4,5}*Universiti Pendidikan Sultan Idris, Tanjong Malim Perak 35900, Malaysia*

venissa@unimus.ac.id

Abstract. Designing textbooks that apply STEM in them and also have the theme of local wisdom from the city of Brebes Indonesia, fraction material to improve learning outcomes for elementary school students. This research is a product development research in the form of a textbook using ADDIE stages (Analysis, Design, Development, Implementation, and Evaluation). Data were obtained from interviews, documentation, validation sheets, and questionnaires. The data obtained were then analyzed descriptively with the aim that the products developed were valid and practical to use in learning. The results of the research show that students still have difficulty solving contextual problems related to fractions, the textbooks that have been used so far have not been able to facilitate students in improving learning outcomes, especially in solving contextual problems in fractional material. So it is necessary to develop a book containing material and contextual problems regarding local wisdom that can be solved using STEM stages. STEM textbooks with the theme of local wisdom in fractional numbers are included in the valid criteria, namely obtained from the results of material experts of 3.68, media experts of 3.46, and the average of both is 3.57, so STEM textbooks with the theme of wisdom of the locale is valid. The average response of students and educators is 3.50, so the STEM textbook with the theme of practical local wisdom. The results of this study can be used by elementary school teachers and students in teaching mathematics about fractions.

Keywords: STEM, Local Wisdom, Brebes Indonesia, Textbooks, Fractional Numbers.

1. Introduction

At the elementary school level, teaching materials are the most important factor in creating an effective learning process for students [1]. The most important teaching materials for learning mathematics are textbooks [2]. Textbooks have a big role in a learning activity because textbooks have a strong influence on the content of the material to be taught and learned [3]. A good textbook is one that can attract students' attention and help students

learn independently [4] [5] [6]. Likewise for math material. Mathematics is a subject that has an important position in human life and in the development of science and technology [7] [8]. Mathematical skills require more than just counting [9][10], but also require the ability to reason logically and critically when solving problems related to everyday events with mathematical solutions [11] [12]. One of the materials in elementary school that is also important to learn is fractions. Fractional material can be related to everyday life, including local wisdom. Local wisdom can be implemented in the learning process, as an effort to preserve the local culture of an area [13] [14]. The existence of local wisdom makes the learning atmosphere interesting and fun, so students don't get bored easily and can find meaning in learning math material [15] [16].

Based on observations made by one of the Brebes Elementary Schools, they still use modules/package books and textbooks as learning media. The results of the researchers' observations of these observations include that teachers still use conventional learning that does not involve students, learning outcomes regarding student fractions are still many that have not been completed, this is indicated by scores that are still below average. In addition to making observations, he also conducted interviews with one of the teachers at MI Muhammadiyah Dumeling, where the results of the interview were students' mastery of mathematics material, especially fractional material. Books that are available have not been able to facilitate students to learn material about fractions in solving contextually related problems.

Based on the problems above, it is necessary to have the right problem solver. One idea that can solve the problems above is the development of media that is more creative, innovative and can increase student learning motivation in participating in learning activities [17] [18]. So that the learning objectives can be achieved. The media that can be made are teaching materials that can construct students' thinking in studying material and solving problems related to everyday life, namely by applying STEM (Science, Technology, Engineering, Mathematics) [19] [20]. The application of STEM does not only focus on cognitive development [21], but also at the affective domain level [22]. STEM provides space for students to actively participate in learning by working together, being disciplined, helping each other in integrating various experiences in student life [23] [24] [25]. STEM is suitable in forming and developing aspects of knowledge (cognitive), aspects of attitudes (affective) and aspects of skills (psychomotor) [26]. The application of STEM is closely related to contextual problems [27], so that the application of STEM in teaching materials as a solution to problems is combined with local wisdom. Local wisdom is a view of life and knowledge as well as various kinds of real life strategies carried out by local people in solving some of the existing problems [28]. Learning related to local wisdom will also make it easier for students to interpret the material [29]. The existence of material linkages with local wisdom will make students not only improve their cognitive abilities, but will also learn culture and other knowledge. The local wisdom referred to in this study is the local wisdom in Brebes.

Brebes itself is one of the districts in Central Java. Brebes Regency has various distinctive characteristics, including: food namely salted eggs, aci tofu, cireng (fried aci), batik brebes, and the typical Brebes dance. The local wisdom can be used as teaching materials for fractional numbers. The existence of STEM textbooks with the theme of local wisdom can have an impact on student learning outcomes on fractions. The purpose of this research is to design textbooks that apply STEM in them and also have the theme of local wisdom from the city of Brebes. The design is of course done so that elementary school students can find out the usefulness of learning mathematics material. Fractional material can be implemented in everyday life which is still related to the local wisdom around them. So that apart from learning mathematics, students can also deepen the local culture, which is now often replaced by the culture of other countries that enter their country. This has resulted in students now not being familiar with local wisdom in their surroundings.

2. Methods

This study uses research and development methods to produce a product in the form of teaching materials, in the form of textbooks. This research and development uses the ADDIE development model with the stages carried out are analysis, design, development, implementation and evaluation [30]. The subjects in the study were MI Muhammadiyah Dumeling, Brebes, Indonesia, class V.

The instruments in this study were: (1) content and construct validation sheets, (2) validation sheets addressed to experts, namely three material experts and three media experts, and (3) response questionnaire sheets addressed to class teachers and fifth grade students. The data analysis technique used in this research is quantitative and qualitative analysis. The data obtained from validators, teacher questionnaires, student questionnaires and completeness test questions used quantitative analysis. While criticism, suggestions, and input from validators and teachers use qualitative analysis. The following are indicators for each research instrument.

Table 1. Content and Construct Validation Indicators

Aspect	Indicator
Material	<p>Questions according to indicators</p> <p>The material asked is in accordance with competence</p> <p>The material asked is according to the level of the type of school and school level</p> <p>The contents of the questions asked are easy to understand</p>

4 M. Prihaswati, V. D. Mawarsari, E. A. Purnomo, M. Adnan, U. Khasanah

	Limits of questions and answers expected in accordance with the material
construction	<p>The subject matter is formulated briefly, clearly and firmly</p> <p>The main questions do not provide clues to the answer key</p> <p>There are clear instructions on how to do the questions</p> <p>Images are presented clearly and legibly</p> <p>Use question words or commands that lead to answers</p>
Language	<p>Use language that is in accordance with standard Indonesian</p> <p>Using communicative language</p> <p>Do not use local/taboo language</p> <p>The language used is easy to understand</p> <p>Clarity of questions on the problem</p>

Table 2. Media Expert Validation Indicators

Aspect	Indicator
Book cover design	Book cover images and colors
	Layout on the module cover
	The composition and size of the layout elements on the book cover
Book Contents Design	Selection of font type and font size on the book cover
	Layout of contents in the book
	Selection of font type and size in writing the contents of the module
	Writing Language in books
	Illustration in the module problem
	Presentation of pictures and tables
	Various designs, images and colors
There is an element of local wisdom	

Table 3. Material Expert Validation Indicators

Aspect	Indicator
Presentation	Interesting book cover display
	Layout placement (title, text, image, pages) in the book is consistent and appropriate
	Font selection, font size, size
	The spacing used is clear, making it easier for students to read
Language	The pictures in the book can convey the contents of local wisdom material
	Clarity of elements of local wisdom
Material Suitability	The use of language in the book is appropriate with school level books using that language communicative
STEM	The book doesn't use the sentence creates a double meaning
	The book uses simple sentences understood by students

The criteria used in the validation sheet use the criteria in the following table.

Table 4. Expert Validation Criteria[31]

Quality score	Eligibility Criteria	Information
$3,26 < x \leq 4,00$	Valid	Not revision
$2,51 < x \leq 3,25$	Valid Enough	Partial Revision
$1,76 < x \leq 2,50$	Invalid	Partial revision and retesting of material
$1,00 < x \leq 1,75$	Invalid	Total Revision

Instruments for student and teacher responses to find out the practicality of the developed textbooks consist of aspects: book content, book appearance, language, STEM and local wisdom. The following are the practicality test criteria used in this study.

Table 5. Practicality Test Criteria[31]

Quality score	Eligibility Criteria
$3,26 < x \leq 4,00$	Very Practical
$2,51 < x \leq 3,25$	Practical
$1,76 < x \leq 2,50$	Less Practical
$1,00 < x \leq 1,75$	Very Less Practical

3. Results and Discussions

The results of direct observations and interviews with one of the class V teachers obtained at the analysis stage showed that learning still uses conventional methods that do not involve students. The results of learning about student fractions are still many that have not been completed, this is indicated by the value below the average. In learning students understand more when learning uses illustrations in the surrounding environment. One that is considered difficult by students is fractional numbers. Textbooks are an important part of the learning process [2]. Teachers must use available resources and effective learning media in the student environment to guide learning activities through observation, classification, prediction, and decision making [32]. Next, the researcher conducts a competency analysis where at this stage the researcher makes adjustments to the applicable competencies taken from fractional material. After that, the researcher conducted an analysis of the character of the students about what the students needed. Therefore teaching materials are made that can motivate students to learn and understand about learning, namely in the form of STEM books (with the theme of local wisdom which can make students interested in participating in learning mathematics because there are elements of local wisdom that can boost knowledge of students about culture, food, tourism and other parts related to local wisdom.

This design stage was carried out by determining the ideas for developing STEM textbooks with the theme of local wisdom as the theme of discussion in teaching fraction material. Steps taken such as materials and question references, the answers that will be used in making teaching materials are in the form of books and evaluation questions that are adjusted to indicators of competency achievement and learning objectives to be achieved. The material contained in the book is fraction material because students still find it difficult to understand this material. The book is in accordance with the design shown, including: cover, book introduction, material placement design, and is equipped with questions so students can hone their understanding of fraction material, as well as cover design.

The third stage is development, at this stage the researcher makes STEM book products with the theme of local wisdom in accordance with the initial stage products that have been made before. After the textbook is finished, then it is validated. This validation aims to obtain the validity of the contents of the book being developed and obtaining the comments and suggestions developed. Expert validation is used as the basis for improving the product being developed [33]. Then an assessment was carried out by material experts and media experts. Material validation was assessed by several SD/MI school teachers who were in Brebes, namely 2 teachers at MI Muhammadiyah Dumeling, 1 SD Negeri Kupu 01, MI Paguyangan, and SD Negeri Bulakamba 01 who had teaching experience. The validator was asked to fill out an assessment and comment on the book he made, namely a STEM book with the theme of local wisdom. The product validation process is carried out by validators, in this case lecturers or experts who have experience in assessing a product, the results of the analysis are used as guidelines for revising/repairing product deficiencies after going through the validation process [34].

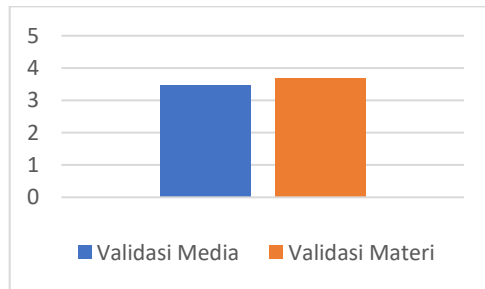


Fig 1. Expert validation results

Based on the results of the validation by several experts above, the value obtained from the material experts is 3.68 with valid criteria with a few revised notes and 3.46 with valid criteria with a few revised notes. Supported by the research of [35], the value obtained from the expert is in the valid percentage range based on the qualification level of validity, so it can be implemented or tested. After validating then the RPP is prepared according to the book.

The fourth stage is Implementation at this stage STEM textbooks with local wisdom themes that have been validated through several validators and then tested on fifth grade students MI Muhammadiyah Dumeling. The small-scale trial was carried out by 9 fifth grade students from different schools through a home visit, the results of which were in the form of suggestions or comments before the large-scale trial was carried out. After conducting a small-scale trial, the researcher then conducted a large-scale trial conducted by fifth grade students at MI Muhammadiyah Dumeling, totaling 34 students and 2 fifth grade educators.

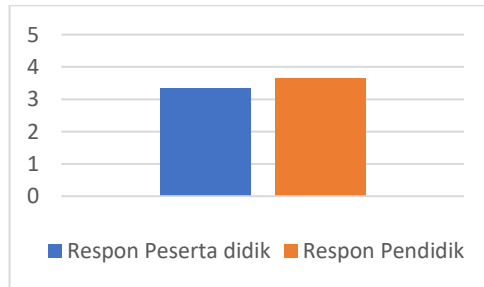


Fig 2. Response results

Based on the results of the assessment of student responses, a score of 3.34 was obtained with practical criteria and the teacher's assessment obtained a score of 3.66 with practical criteria. So that it can be concluded that the responses of students and educators to STEM textbooks with the theme of local wisdom include practical and feasible criteria. Practicality can be seen from the results of the implementation and achievement of learning observed and assessed by observers and the results of opinions from educators or students [36].

The evaluation stage, the developed textbook is the stage where the researcher evaluates the results of the suggestions and comments obtained as a basis for improving the developed media [37]. It can be concluded that learning STEM textbooks with local wisdom on fractions for fifth grade students is a valid and practical teaching material [34]. The media developed obtained ratings from media experts, material experts and learning experts as well as limited trials by teachers and students and were said to be suitable for use as learning media in the teaching and learning process in schools [38]. It can be concluded that because the learning of STEM textbooks with the theme of local wisdom has material descriptions in the form of local wisdom according to the needs of students and is equipped with practice questions and evaluation questions so that students are more interested in learning.

4. Conclusions

STEM textbooks with the theme of local wisdom, are included in the valid and practical criteria that are proven. The average of both is 3.57, so the STEM textbook with the theme of local wisdom is valid. STEM textbooks with the theme of local wisdom, are included in practical criteria for use and can be proven through the results. The average response of students and educators is 3.50, so the STEM textbook with the theme of local wisdom is valid and practical.

Acknowledgment

The research team would like to thank the Institute for Research and Community Service (LPPM) Universitas Muhammadiyah Semarang Indonesia for providing support in carrying

out the research. We also thank the Universiti Pendidikan Sultan Idris Malaysia and Universitas Ahmad Dahlan Indonesia for the research collaboration that has been carried out.

References

1. Suprihatin, S. and Manik, Y.M. (2020), “Guru Menginovasi Bahan Ajar Sebagai Langkah Untuk Meningkatkan Hasil Belajar Siswa”, *PROMOSI (Jurnal Pendidikan Ekonomi)*, Vol. 8 No. 1, pp. 65–72.
2. Sievert, H., van den Ham, A.K., Niedermeyer, I. and Heinze, A. (2019), “Effects of mathematics textbooks on the development of primary school children’s adaptive expertise in arithmetic”, *Learning and Individual Differences*, Elsevier, Vol. 74 No. February, p. 101716.
3. Dewantara, A.H. (2019), “Analisis Konten Buku Teks Matematika K-13 Terkait Pontesi Pengembangan Literasi Matematis”, *Didaktika: Jurnal Kependidikan*, Vol. 13 No. 2, pp. 112–130.
4. Ardianti, F. (2022), “Efektifitas penggunaan video sebagai media pembelajaran untuk siswa sekolah dasar”, *Nautical : Jurnal Ilmiah Multidisiplin Indonesia*, Vol. 1 No. 1, pp. 5–8.
5. Magdalena, I., Fatakhatus Shodikoh, A., Pebrianti, A.R., Jannah, A.W., Susilawati, I. and Tangerang, U.M. (2021), “Pentingnya Media Pembelajaran Untuk Meningkatkan Minat Belajar Siswa Sdn Meruya Selatan 06 Pagi”, *EDISI : Jurnal Edukasi Dan Sains*, Vol. 3 No. 2, pp. 312–325.
6. Suryadi, R.A. and Mushlih, A. (2019), “DESAIN MEDIA PEMBELAJARAN MATEMATIKA DENGAN MENGGUNAKAN SOFTWARE CABRI 3D DAN ADOBE FLASH PADA MATERI POKOK BANGUN RUANG KUBUS DAN BALOK DI KELAS VIII SMP NEGERI 7 KOTA JAMBI”, p. 200.
7. Sudihartinih, E., Novita, G. and Rachmatin, D. (2021), “Desain Media Pembelajaran Matematika Topik Luas Daerah Segitiga Menggunakan Aplikasi Scratch”, *Jurnal Cendekia: Jurnal Pendidikan Matematika*, Vol. 5 No. 2, pp. 1390–1398.
8. Rahman, J., Susanti, A. and PMIPA Program Studi Pendidikan Matematika, J. (2022), “Pengaruh Gaya Belajar Terhadap Hasil Belajar Matematika Siswa Kelas Vii Smp N 14 Sarolangun”, *Jurnal Pendidikan Matematika Mat-Edukasia*, Vol. 7 No. 1, pp. 47–52.
9. Saputri, N.C., Sari, R.K. and Ayunda, D. (2021), “Analisis Kemampuan Literasi Matematis Siswa dalam Online Learning pada Masa Pandemi Covid-19”, *Jurnal Pendidikan Dan Pembelajaran Terpadu (JPPT)*, Vol. 3 No. 1, pp. 15–26.
10. Mawarsari, V.D., Astuti, A.P., Purnomo, H. and Sedyono, E. (2020), “The Readiness of Prospective Mathematics Teachers in Utilizing Technology in The 21st Century Learning Process”, *Proceedings of the 2nd International Conference on Education*, pp. 481–491.

11. Azizah, R., Zaenuri and Kharisudin, I. (2020), “Kemampuan pemecahan masalah matematika dalam menyelesaikan soal cerita siswa SMA”, *PRISMA, Prosiding Seminar Nasional Matematika*, Vol. 3, pp. 237–246.
12. Anwar, N.T. (2018), “Peran Kemampuan Literasi Matematis pada Pembelajaran Matematika Abad-21”, *Prosiding Seminar Nasional Matematika*, Vol. 1, pp. 364–370.
13. Wardhani, I.S.K. (2022), “Pengembangan Video Pembelajaran Berbasis Numerasi dengan Kearifan Lokal Untuk Siswa SD”, *Jurnal Educatio FKIP UNMA*, Vol. 8 No. 3, pp. 908–914.
14. Kustriani, W., Mawarsari, V.D., Joko, I., Semarang, U.M., Semarang, U.M. and Semarang, U.M. (2023), “DESIGNING MATHEMATICS LEARNING VIDEOS : INCORPORATING LOCAL WISDOM TO”, *Kalamatika: Jurnal Pendidikan Matematika*, Vol. 8 No. 1, pp. 77–92.
15. Aisara, F., Nursaptini, N. and Widodo, A. (2020), “Melestarikan Kembali Budaya Lokal melalui Kegiatan Ekstrakurikuler untuk Anak Usia Sekolah Dasar”, *Cakrawala Jurnal Penelitian Sosial*, Vol. 9 No. 2, pp. 149–166.
16. Yusria, I. (2021), “Upaya Guru Dalam Melestarikan Nilai Kebudayaan Lokal the Effort To Preserve the Value of Local Culture Through Social Studies 2019 / 2020”, *Journal of Social Studies*, Vol. 2 No. 2, pp. 175–192.
17. Genc, M. and Erbas, A.K. (2019), “Secondary Mathematics Teachers’ Conceptions of Mathematical Literacy To cite this article : Secondary Mathematics Teachers’ Conceptions of Mathematical Literacy”, *International Journal of Education in Mathematics, Science and Technology*, Vol. 7 No. 3, pp. 222–237.
18. Mawarsari, V.D., Astuti, A.P. and Purnomo, H.D. (2021), “The Creativity of Pre-Service Mathematics Teachers in Digital Learning”, *Indonesian Journal of Mathematics Education*, Vol. 4 No. 2, pp. 45–52.
19. Singer, A., Montgomery, G. and Schmoll, S. (2020), “How to foster the formation of STEM identity: studying diversity in an authentic learning environment”, *International Journal of STEM Education, International Journal of STEM Education*, Vol. 7 No. 1, available at:<https://doi.org/10.1186/s40594-020-00254-z>.
20. Farwati, R., Metafisika, K., Sari, I., Sitinjak, D.S., Solikha, D.F. and Solfarina, S. (2021), “STEM Education Implementation in Indonesia: A Scoping Review”, *International Journal of STEM Education for Sustainability*, Vol. 1 No. 1, pp. 11–32.
21. Widya, Rifandi, R. and Laila Rahmi, Y. (2019), “STEM education to fulfil the 21st century demand: A literature review”, *Journal of Physics: Conference Series*, Vol. 1317 No. 1, available at:<https://doi.org/10.1088/1742-6596/1317/1/012208>.
22. Hasanah, U. (2020), “Key Definitions of STEM Education: Literature Review”, *Interdisciplinary Journal of Environmental and Science Education*, Vol. 16 No. 3, p. e2217.
23. Suwarma, I.R. and Kumano, Y. (2019), “Implementation of STEM education in Indonesia: Teachers’ perception of STEM integration into curriculum”, *Journal of Physics: Conference Series*, Vol. 1280 No. 5, available at:<https://doi.org/10.1088/1742-6596/1280/5/052052>.

24. Diana, N., Turmudi and Yohannes. (2021), “Analysis of teachers’ difficulties in implementing STEM approach in learning: A study literature”, *Journal of Physics: Conference Series*, Vol. 1806 No. 1, available at:<https://doi.org/10.1088/1742-6596/1806/1/012219>.
25. Hamad, S., Tairab, H., Wardat, Y., Rabbani, L., Alarabi, K., Yousif, M., Abu-Al-Aish, A., et al. (2022), “Understanding Science Teachers’ Implementations of Integrated STEM: Teacher Perceptions and Practice”, *Sustainability (Switzerland)*, Vol. 14 No. 6, pp. 1–19.
26. Toto, T., Yulisma, L. and Amam, A. (2021), “Improving teachers’ understanding and readiness in implementing stem through science learning simulation”, *Jurnal Pendidikan IPA Indonesia*, Vol. 10 No. 2, pp. 303–310.
27. Khotimah, R.P., Adnan, M., Ahmad, C.N.C. and Murtiyasa, B. (2021), “Science, Mathematics, Engineering, and Mathematics (STEM) Education in Indonesia: A Literature Review”, *Journal of Physics: Conference Series*, Vol. 1776 No. 1, available at:<https://doi.org/10.1088/1742-6596/1776/1/012028>.
28. Domu, I. and Mangelep, N.O. (2019), “Developing of Mathematical Learning Devices Based on the Local Wisdom of the Bolaang Mongondow for Elementary School”, *Journal of Physics: Conference Series*, Vol. 1387 No. 1, available at:<https://doi.org/10.1088/1742-6596/1387/1/012135>.
29. Alim, J.A., Hermita, N., Alim, M.L., Wijaya, T.T. and Pereira, J. (2021), “Developing a Math Textbook using realistic Mathematics Education Approach to increase elementary students’ learning motivation”, *Jurnal Prima Edukasia*, Vol. 9 No. 2, pp. 193–201.
30. Rahayu, F.D., Mawarsari, V.D. and Suprpto, R. (2023), “DEVELOPMENT OF PBL E-MODULES ON POLYHEDRON CONSTRUCTIONS FOR GEOMETRICAL THINKING ABILITY”, *Kalamatika: Jurnal Pendidikan Matematika*, Vol. 8 No. 1, pp. 107–118.
31. Etanastia, D., Noviyana, H. and AB, J.S. (2022), “Pengembangan Modul Elektronik Berbasis Pendekatan Kontekstual Pada Pokok Bahasan Bangun Ruang Sisi Datar”, *JURNAL E-DuMath*, Vol. 8 No. 1, pp. 8–14.
32. Dj Pomalato, S.W., Ili, L., Ningsi, B.A., Fadhilaturrahmi, Hasibuan, A.T. and Primayana, K.H. (2020), “Student error analysis in solving mathematical problems”, *Universal Journal of Educational Research*, Vol. 8 No. 11, pp. 5183–5187.
33. Peters, O. (2000), “Digital Learning Environments: New Possibilities and Opportunities | The International Review of Research in Open and Distributed Learning”, *International Review of Research in Open and Distributed Learning*, Vol. 1 No. 1, pp. 1–19.
34. Lin, M.H., Chen, H.C. and Liu, K.S. (2017), “A study of the effects of digital learning on learning motivation and learning outcome”, *Eurasia Journal of Mathematics, Science and Technology Education*, Vol. 13 No. 7, pp. 3553–3564.
35. Hartshorne, R. (2020), “Resisting Dehumanizing Assessments : Enacting Critical Humanizing Pedagogies in Online Teacher Education Teaching , Technology , and

- Teacher Education During the COVID-19 Pandemic : Stories from the Field Edited by Regina Kaplan-Rakowski”, No. June.
36. Nagasubramani, R.R.P.C. (2018), “Impact of modern technology in education R.”, *Journal of Applied and Advanced Research*, Vol. 3 No. 1, pp. 33–35.
 37. Chun, T.C. and Abdullah, M.N.L.Y. (2022), “the Effects of Language Teachers’ Attitudes, Barriers and Enablers in Teaching 21St Century Skills At Chinese Vernacular Schools”, *Malaysian Journal of Learning and Instruction*, Vol. 19 No. 1, pp. 115–146.
 38. Tvenge, N. and Martinsen, K. (2018), “Integration of digital learning in industry 4.0”, *Procedia Manufacturing*, Elsevier B.V., Vol. 23 No. 2017, pp. 261–266.

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

