



Validity of competency-based architecture textbooks in the concentration of building modeling and information design at SMK Negeri 3 Tanjungpinang

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ABSTRACT

Ideally, textbooks used in the learning process at vocational schools should serve as a bridge between theory and practice in the field. However, in reality, the textbooks available at SMK Negeri 3 Tanjungpinang still need improvement. This study aims to determine the validity of the competency-based architecture textbooks that have been developed to support learning in the DPIB Specialization at SMK Negeri 3 Tanjungpinang. This research is R&D research using the ADDIE development model, but this research only confirms the Development stage (validation of the development product). The validation process was carried out by media experts and subject matter experts using a Likert scale-based questionnaire covering aspects of appearance, language, content, and presentation. The data were analyzed descriptively and quantitatively by calculating the total score and determining the level of feasibility. The validation results showed that the textbook obtained a very high level of validity, with a percentage of 98.5% in the learning media aspect and 97% in the learning material aspect. Thus, the average validation results showed that the developed textbook was in the highly valid category, which means that it met the feasibility criteria in terms of content and learning media, making it suitable for use as a learning resource in learning activities at vocational schools.



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INTRODUCTION

In the current era of the 4.0 industrial revolution, vocational school students are required to not only master technical skills but also have critical, creative, and adaptive thinking skills in response to ever-changing technological developments (B. Arifin & Mu' id, 2024). Therefore, learning in vocational schools must be able to integrate theory, practice, and technology in a balanced manner. One area of expertise that requires the integration of theoretical and practical skills is Building Modeling and Information Design (DPIB). This is because students are required to understand the principles of architecture, building drawing techniques, and building information modeling (Building Information Modeling/BIM) (Nasution & Nasution, 2025). In the learning process, students are not only required to understand architectural theory but also to master visual, design, and accurate building construction skills (Faridah & Muzakki, 2024). To achieve this goal, teaching materials that are relevant, contextual, and able to bridge theory with practice in the field are needed.

According to Pratiwi & Widyaningrum (2021), a good textbook must fulfill the elements of content, language, presentation, and graphics in order to be used effectively by students. In the context of vocational education, textbooks not only serve as a source of information, but also as a practical guide that leads students to understand work procedures and apply the concepts they have learned (Akbar et al., 2024; Blegur et al., 2023). However, in reality, many textbooks used in vocational schools are still general in nature and do not fully correspond to the characteristics and needs of specific fields of expertise such as DPIB.

This phenomenon is relevant to the conditions at SMK Negeri 3 Tanjungpinang, particularly in the DPIB Specialization, where the architecture learning process requires textbooks that are able to

accommodate vocational competency requirements. The textbooks used should be based on architectural competencies, with structured and applicable material presentation in accordance with the applicable curriculum. However, observations show that most of the textbooks used are still theoretical and do not sufficiently link architectural concepts to field practice, making it difficult for students to understand the relationship between theory and its application in real projects. This condition emphasizes the need to develop competency-based architecture textbooks that are suitable for the characteristics of vocational school students. In addition, competency-based textbooks also enable independent and continuous learning, so that students can learn according to their own pace and learning style.

In the process of developing textbooks, the validation stage by experts is an important step that cannot be ignored. The validity of textbooks aims to ensure that the developed product meets the eligibility standards in terms of content and learning media, and can support the achievement of student competencies before being implemented in the learning process. According to Ulfah et al. (2025), validity indicates the extent to which a development instrument or product can measure or represent what it is supposed to measure. If a validation result shows a high value, it can be interpreted that the textbook is of good quality and can be used as an effective learning medium.

Previous studies have shown that the development and validation of textbooks play an important role in improving the quality of learning, especially in vocational education. Anjarsari et al. (2022) proved that contextual-based textbooks are deemed suitable for use after undergoing expert validation with a validity level above 90%. Similar results were also found by Astuti et al. (2024), who stated that the validity of teaching media is a key indicator of the suitability of teaching materials before they are implemented in learning. Research in the field of vocational education also shows the same trend. Sukendra et al. (2022) developed a vocational learning study textbook and obtained a highly valid category in terms of media and material. Salimatun et al. (2025) emphasized that well-validated vocational teaching materials are able to bridge the learning needs between theory and practice, making them more relevant to the demands of the world of work. In addition, Purba et al. (2024) stated that testing the validity of learning products is a crucial step to ensure the correctness of concepts, clarity of language, and suitability of materials to the characteristics of students.

Based on the review of previous studies, a research gap can be identified, namely the limited number of studies that specifically examine the validity of competency-based architecture textbooks in the DPIB Specialization at vocational schools. Most previous studies have focused on the development of learning models, improving student competencies, or the development of learning media in general, without placing a strong emphasis on the process of validating textbooks as the main source of learning in vocational education. This study not only examines the suitability of the material content but also comprehensively assesses the learning media aspects through expert validation, thereby providing empirical contributions to the development of valid, contextual, and relevant vocational teaching materials for architectural learning needs in vocational schools.

Based on this background, this study aims to determine the validity level of competency-based architecture textbooks developed for the DPIB Specialization Concentration at SMK Negeri 3 Tanjungpinang. The validation was conducted by media experts and subject matter experts to assess the suitability of the product from two main aspects, namely media presentation and content. Through the results of this validity assessment, it is hoped that an objective picture of the quality of the developed textbook can be obtained, so that it can be used effectively in improving the quality of vocational learning in the field of architecture.

RESEARCH METHODS

This research is an R&D study using the ADDIE development model. This study is limited to the product validation process (validation of the content and media of the textbook), which is part of the Development stage of the ADDIE model, rather than research involving the entire ADDIE model development process. To assess the validity of a competency-based architecture textbook, this study uses a quantitative descriptive approach.

The validation was carried out by four expert validators, namely two learning material experts and two learning media experts, who were selected based on their competence and experience in their fields. The selected media expert validators had competence and backgrounds in graphic design and educational technology, while the material expert validators had competence and backgrounds in architecture and vocational education. The validation instrument used was a 4-point Likert scale questionnaire based on the aspects of book appearance, language, content, and presentation of book content. The Likert scale used had a score of 1–4, namely (1) = Very Unsuitable, (2) = Unsuitable, (3) = Suitable, and (4) = Very Suitable.

The validation process began with the distribution of questionnaires to validators after they had read and comprehensively evaluated the textbook (Sarip et al., 2022). The validation data were processed descriptively and quantitatively by calculating the total score for each aspect of the validators' assessment, which was then converted into a validity percentage. The validity level is determined based on the percentage value, then categorized according to the criteria applicable in textbook validation studies (Damayanti et al., 2018). A textbook is declared highly valid if it obtains a percentage of $\geq 85\%$ for each assessment aspect.

RESULTS AND DISCUSSION

Media Expert Validation Results

Validation of media aspects includes assessment of appearance, readability, layout, and visual suitability for vocational school students. Based on the analysis results, the first media expert gave a total score of 157, while the second media expert gave a score of 158 out of a maximum score of 160. The validity rates were 98% and 99%, respectively, with an average of 98.5%, which falls into the category of “highly valid.”

Table 1. Validation Results by Media Experts

Validator	Score Obtained	Maximum Score	Percentage	Category
Media Expert 1	157	160	98%	Highly Valid
Media Expert 2	158	160	99%	Highly Valid
Mean			98.5%	Highly Valid

These results show that competency-based architecture textbooks have an attractive, clear, and user-friendly appearance and media design. The validators provided a few minor notes, such as adjusting color contrast and text alignment to make it more comfortable to read, but overall the product has met the criteria for learning media feasibility.

Validation Results by Subject Matter Experts

Validation of content aspects includes assessment of four main aspects, namely content feasibility, language, presentation, and usefulness of material in supporting learning outcomes. The validation results show that both experts gave a total score of 97 out of a maximum score of 100, with a validity percentage of 97% each.

Table 2. Validation Results by Subject Matter Experts

Validator	Score Obtained	Maximum Score	Percentage	Category
Subject Matter Expert 1	97	100	97%	Highly Valid
Subject Matter Expert 2	97	100	97%	Highly Valid
Mean			97%	Highly Valid

The results show that the content of the textbook is in line with the curriculum and basic competencies in the DPIB concentration. The validators assessed that the presentation of the material

was systematic, used easy-to-understand language, and described the integration of architectural theory and practice.

Recapitulation of Textbook Validity Results

Based on the validation results from media and material experts, the overall validity rate was 97.75%, which falls into the category of “highly valid.” These results indicate that the competency-based architecture textbook meets the eligibility criteria in terms of both content and learning media.

Table 3. Recapitulation of Textbook Validity Results

Assessment Aspects	Mean (%)	Category
Learning Media	98.5%	Highly Valid
Learning Materials	97%	Highly Valid
Overall Average	97.75%	Highly Valid

Thus, the competency-based architecture textbook that has been developed is deemed suitable for use in learning activities in the DPIB Specialization at SMK Negeri 3 Tanjungpinang. The revisions made were only minor, namely improvements to the visual appearance and the arrangement of sub-materials to make them more systematic.

Discussion

The high validation scores from both media and material experts indicate that the competency-based architecture textbook has been systematically compiled in accordance with the principles of vocational teaching material development. In terms of media, the average score of 98.5% indicates that the visual appearance, layout, font selection, and use of illustrations and supporting images have been designed with readability and the characteristics of vocational school students in mind. Consistent visual presentation, neat page structure, and integration of graphic elements relevant to architectural material also contribute to the high level of acceptance of the quality of learning media by validators.

These findings support the results of previous research conducted by Ali et al. (2025), which found that the quality of media in teaching materials greatly influences student interest and understanding, as clear and systematic visual displays can increase the effectiveness of learning message delivery. Furthermore, these findings are also in line with the research by Sondang et al. (2024), who developed an Internet of Things-based vocational learning textbook with a media validity of 93%. The study emphasizes the importance of media design and visual presentation in ensuring student comprehension in vocational fields. Thus, the high validity results in this study reinforce the view that media quality is an important factor in the success of competency-based textbooks.

In addition, the very high validation results in terms of material (97%) indicate that the content of the textbook meets the curriculum requirements and basic competencies of the DPIB Specialization. The material is arranged sequentially from basic concepts to applications, using language that is communicative and appropriate to the cognitive development level of vocational school students. The integration of architectural theory and practical examples in the field is one of the main factors that strengthens the positive assessment of the validators, because the textbook not only presents concepts, but also guides students towards contextual understanding.

The results of this study are consistent with the findings of Damayanthi et al. (2022), who stated that vocational teaching materials with high validity show consistency between the content and the vocational context, thereby supporting the development of specific skills in line with the world of work. In addition, Desra et al. (2022) also emphasized that high validity in terms of content indicates that learning products contain correct concepts, appropriate language, and relevance to the needs of learners. In the context of this study, architecture textbooks are not only theoretically valid but also contextual—because the content is tailored to the needs of students in learning the basics of building architecture.

The high validity score is also inseparable from the process of compiling competency-based textbooks, in which each material is designed to support the achievement of specific skills needed in DPIB learning. High validity at this stage indicates that the product is ready for use and only requires

minor revisions. This approach makes the content of the textbook more relevant to the needs of vocational learning and the world of work, so that it is considered feasible and useful by experts. In a similar study by Arifin et al. (2019), contextual-based textbooks were also declared suitable for use after obtaining a validity score above 90%. This shows that high validity is a key indicator of the suitability of learning products, both in terms of content and media.

Overall, these validation results reinforce the principle that vocational textbooks must be developed with consideration given to the balance between content accuracy and media design. High validity in both aspects indicates that competency-based architecture textbooks have met academic and pedagogical requirements and are ready to be used as independent learning resources or classroom learning aids. This highly validated competency-based architecture textbook serves as a learning tool that can guide the learning process from mere theoretical understanding to the formation of measurable work competencies. The systematic presentation of material, accompanied by the integration of concepts and applications, supports the realization of meaningful learning that is in line with the characteristics of vocational school students.

Compared to the research by Wahyudi & Sabara (2023), which focuses on the validation of technology-based vocational learning media using the Internet of Things, this research has the advantage of focusing on specific expertise competencies, namely architecture and DPIB. Meanwhile, this study and the study by Putera & Shofiah (2021) show similarities in their approach to vocational-based teaching materials, but there are differences in the context and contribution to learning. Furthermore, Mursid's (2021) research only developed contextual-based textbooks for general subjects, while this study provides a more specific contribution to vocational education, with an emphasis on the direct relationship between learning materials and work competencies.

The pedagogical implications of this study indicate that well-validated competency-based textbooks can be a strategic instrument in improving the quality of vocational learning. For teachers, these textbooks can be used as a structured learning guide that is consistent with the curriculum. For students, these textbooks support independent learning and the strengthening of basic architectural competencies. Meanwhile, for schools and curriculum developers, the results of this study provide an empirical basis that textbook validation is an important step in ensuring the quality of learning resources in vocational secondary education, particularly in the DPIB Specialization.

CONCLUSION

This study concludes that the textbooks that have been developed are suitable for the characteristics of vocational school students and are in line with curriculum requirements, thus functioning effectively as a learning resource and learning medium that supports vocational learning. This statement is proven by the results of validation by media experts and subject matter experts, which show a very high level of validity. This means that the developed textbook has met the eligibility criteria, both in terms of content and appearance. These findings indicate that the integration of architectural competencies into textbooks can produce teaching materials that are not only academically valid but also pedagogically and contextually relevant to vocational learning needs. Thus, this textbook makes a real contribution to the development of competency-based teaching materials in vocational secondary education.

This study has limitations because it only presents expert validity tests, but has not tested practicality or effectiveness. As a recommendation, further research is advised to test the practicality and effectiveness of the textbook through direct implementation in the learning process to determine its impact on student learning outcomes and motivation. In addition, developing the textbook into an interactive digital format could be an innovative alternative to expand the use of the product and support technology-based learning in vocational schools.

REFERENCES

Akbar, A., Wahyudi, A. R. E. P., Agustiawan, M. P., Nugraha, M. T., & Kurniawan, C. (2024). Merancang Struktur Konsep Pengembangan Bahan Ajar PAI Dengan Mengadaptasi Beragam

- Sumber Informasi Hasil Riset Termutakhir. *Jurnal Ilmiah Global Education*, 5(2), 1751–1760. <https://doi.org/10.55681/jige.v5i2.2636>
- Ali, A., Venica, S. D., Aini, W., & Hidayat, A. F. (2025). Efektivitas media pembelajaran interaktif dalam meningkatkan minat dan motivasi belajar siswa sekolah dasar. *Journal of Information System and Education Development*, 3(1), 1–6. <https://doi.org/10.62386/jised.v3i1.115>
- Anjarsari, M., Rochmiyati, R., & Distrik, I. W. (2022). Pengembangan bahan ajar berbasis kontekstual pada pembelajaran tematik untuk meningkatkan kemampuan berpikir kritis. *Bulletin of Counseling and Psychotherapy*, 4(2), 462–474. <https://doi.org/10.51214/bocp.v4i3.347>
- Arifin, B., & Mu'id, A. (2024). Pengembangan kurikulum berbasis keterampilan dalam menghadapi tuntutan kompetensi abad 21. *DAARUS TSAQOFAH Jurnal Pendidikan Pascasarjana Universitas Qomaruddin*, 1(2), 118–128. <https://doi.org/10.62740/jppuqg.v1i2.23>
- Arifin, S., Hidayati, Y., Wulandari, A. Y. R., & Ahied, M. (2019). Uji Kelayakan Buku Ajar Berbasis Ayat Al-Qur'an pada Materi Tata Surya. *Natural Science Education Research*, 2(2), 133–139. <https://doi.org/10.21107/nser.v2i2.6240>
- Astuti, R. B., Supeno, S., & Purwantiningsih, A. (2024). Validitas dan Kepraktisan Bahan Ajar IPAS Berbasis Multirepresentasi untuk Meningkatkan Keterampilan Kolaborasi Siswa Sekolah Dasar. *Jurnal Pendidikan: Riset Dan Konseptual*, 8(4), 877–887. https://doi.org/10.28926/riset_konseptual.v8i4.1097
- Blegur, J., Lumba, A. J. F., & Ngongo, M. (2023). Tracing physical education teachers' teaching difficulties in online era using teaching skill indicators. *Pegem Journal of Education and Instruction*, 13(1), 125–134. <https://doi.org/10.47750/pegegog.13.01.15>
- Damayanthi, K. A. U., Widana, I. W., & Sumandya, I. W. (2022). Pengembangan bahan ajar matematika berbasis vokasi menggunakan linkfly siswa kelas X SMK. *Indonesian Journal of Educational Development (IJED)*, 3(2), 199–208. <https://doi.org/10.5281/zenodo.7026852>
- Damayanti, A. E., Syafei, I., Komikesari, H., & Rahayu, R. (2018). Kelayakan media pembelajaran fisika berupa buku saku berbasis android pada materi fluida statis. *Indonesian Journal of Science and Mathematics Education*, 1(1), 63–70.
- Desra, N. H., Fitri, I., & Irma, A. (2022). Uji Validitas dan Uji Praktikalitas Lembar Kerja Siswa Berbasis Pendekatan Problem Based Learning pada Materi Segiempat. *Juring (Journal for Research in Mathematics Learning)*, 5(2), 147–156. <https://doi.org/10.24014/juring.v5i2.14851>
- Faridah, Z., & Muzakki, A. (2024). Strategi Meningkatkan Potensi Kecerdasan Visual-Spasial Peserta Didik di Tingkat Sekolah Dasar. *Madrasah Ibtidaiyah Education Journal*, 2(1), 22–31.
- Mursid, R. (2021). Pengembangan Bahan Ajar Kewirausahaan Berbasis Kontekstual Pada Mata Pelajaran Bisnis Manajemen. *Jurnal TIK Dalam Pendidikan*, 8(1), 71–79.
- Nasution, M. A., & Nasution, A. M. (2025). Peningkatan Kompetensi Siswa Smk Negeri Percut Sei Tuan Melalui Edukasi Building Information Modeling (Bim) Dan Desain Arsitektur Berkelanjutan. *Mejuajua: Jurnal Pengabdian Pada Masyarakat*, 5(1), 156–166. <https://doi.org/10.52622/mejuajujabdimas.v5i1.268>
- Pratiwi, U. R., & Widyaningrum, T. (2021). Analisis kualitas dan efektivitas pemanfaatan buku ajar biologi SMA kelas x semester 1. *Edu Sains: Jurnal Pendidikan Sains Dan Matematika*, 9(2), 164–177. <https://doi.org/10.23971/eds.v9i2.2271>
- Purba, A. O., Tarigan, B., Kembaren, G. B., Panjaitan, I. A., Simanjuntak, J. M. W., & Hanum, I. (2024). Analisis validitas isi pada buku teks Bahasa Indonesia SMP kelas VIII kurikulum merdeka tahun 2021. *Jurnal Intelek Dan Cendikiawan Nusantara*, 1(3), 3191–3197.
- Putera, Z. F., & Shofiah, N. (2021). Model kurikulum kompetensi berpikir pada pembelajaran Bahasa Indonesia di Perguruan Tinggi Vokasi. *Jurnal Pendidikan Bahasa Dan Sastra Indonesia Metalingua*, 6(1), 29–36. <https://doi.org/10.21107/metalingua.v6i1.10094>

- Salimatun, S., Nurjanah, N., & Nurhadi, D. (2025). Pengembangan Media Video Pembelajaran Praktik Dessert Pineapple Flambe Bagi Siswa Program Keahlian Kuliner SMK. *Didaktika: Jurnal Kependidikan*, 14(4 Nopember), 6705–6718. <https://doi.org/10.58230/27454312.3218>
- Sarip, M., Amintarti, S., & Utami, N. H. (2022). Validitas dan keterbacaan media ajar e-booklet untuk siswa SMA/MA materi keanekaragaman hayati. *JUPEIS: Jurnal Pendidikan Dan Ilmu Sosial*, 1(1), 43–59. <https://doi.org/10.57218/jupeis.Vol1.Iss1.30>
- Sondang, M. S., Agung, A. I., Dewanto, D., & Wibowo, T. W. (2024). Validasi Buku Ajar Kajian Pembelajaran Vokasi dalam Pembelajaran Internet of Things. *Journal of Vocational and Technical Education (JVTE)*, 6(1), 10–17. <https://doi.org/10.26740/jvte.v6n1.p10-17>
- Sukendra, I. K., Surat, I. M., & Darmada, I. M. (2022). Pengembangan Bahan Ajar Matematika Vokasi Digital Berbasis STEM Di SMK Pada Materi Trigonometri. *Widyadari*, 23(1), 59–72.
- Ulfah, M., Darmansyah, D., & Rehani, R. (2025). Instrumen Pengujian Produk Pembelajaran (Pengujian Validitas, Praktikalitas, Efektivitas). *At-Tarbiyah: Jurnal Penelitian Dan Pendidikan Agama Islam*, 3(1), 43–51.
- Wahyudi, W., & Sabara, E. (2023). Pengembangan Media Trainer Rekayasa Sistem Robotika Berbasis Internet of Things. *Jurnal MediaTIK*, 16–22.