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Compliance of Teaching Material Components with Educational Standards

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Abstract:

This study aims to assess the suitability of teaching material components to national education standards through a literature review approach. Teaching materials are a crucial instrument in the learning process, serving not only as a medium for delivering content but also as a bridge between the curriculum and classroom practice. However, in the field, teaching materials are still found to be not fully structured according to national standards, both in terms of content, delivery strategies, and evaluation. Through a literature analysis, this study found that the ideal structure of teaching materials includes components such as learning objectives, materials, learning activities, evaluation, media, and character values, all of which must be arranged coherently and contextually. Recommended approaches to teaching material development include scientific, competency-based, differentiation, and Universal Design for Learning (UDL). In addition, the use of digital technologies such as Learning Management Systems (LMS) and interactive multimedia also enriches the components of teaching materials to make them more adaptive and engaging. This study also identified real challenges in teaching material development, including limited teacher training, inadequate facilities, and low digital literacy. Therefore, strategies are recommended to enhance teacher competency, foster collaboration among educators, facilitate continuous evaluation, and strengthen support from the government and educational institutions. These findings are expected to serve as a reference for teachers, curriculum developers, and policymakers in creating quality teaching materials that are relevant to today's learning dynamics.

Keywords: Artificial Intelligence; brain emotional learning; character education; moral development; technology integration

INTRODUCTION

Education is the primary foundation for developing quality human resources. In the educational process, teaching materials play a crucial role as the primary medium for conveying knowledge, skills, and values to students. Therefore, the development of teaching materials must refer to national education standards to ensure the learning process is systematic, directed, and aligned with the established learning outcomes. These education standards encompass graduate competency standards, content, processes, and assessments, which have been established by the government as a national benchmark for education in Indonesia (Kemendikbud, 2020).

Despite the availability of educational standards, various studies indicate that the development of teaching materials in the field often fails to fully adhere to these standards. Many teachers and teaching material developers still use traditional approaches, without aligning content and presentation methods with curriculum needs and student characteristics. This creates a gap between the material taught and the expected competencies. Therefore, a literature review is essential to examine the extent to which teaching material development practices align with applicable educational standards (Sumarni, 2015).

Academic literature reveals various models and components of teaching materials that can be developed in accordance with curriculum needs. These components, such as learning objectives, materials, learning activities, evaluation, and media and learning resources, are crucial elements in ensuring compliance with educational standards. Examining the structure and content of these teaching materials is crucial for understanding the ideal practices recommended in various literature. Thus, the development of teaching materials can be directed so that they are not only informative but also educational, applicable, and contextual (Mulyasa, 2013).

The literature review also provides insights into various approaches to developing standards-based teaching materials, such as constructivist, scientific, and competency-based approaches. Each approach has its own characteristics and advantages in developing effective teaching materials. Through this analysis, development practices that align with educational standards and address the challenges of 21st-century learning can be identified. Using the right approach to developing teaching materials will support the achievement of more optimal learning outcomes (Majid, 2011). Furthermore, changes in curriculum policies, such as the Independent Curriculum, require teachers and teaching material developers to be more creative and flexible in developing teaching materials. This curriculum, which emphasizes the Pancasila student profile and differentiated learning, requires adaptive and contextual teaching materials. Therefore, a literature review of teaching material components becomes increasingly relevant to ensure that development practices are not only compliant with standards but also responsive to the latest curriculum dynamics (Kemendikbudristek, 2022a).

The main problem that arises in practice is teachers' lack of understanding of the ideal structure of teaching materials that meet standards. Most developed teaching materials focus solely on delivering content, neglecting the learning process and evaluation aspects. However, teaching materials should encompass all learning stages, systematically designed and integrated into a unified whole. This demonstrates the importance of deepening theoretical understanding through literature reviews to strengthen the practice of developing quality teaching materials (Zuhdan, 2016). Numerous studies have been conducted to evaluate the suitability of teacher-developed teaching materials to educational standards. However, several deficiencies have been identified in the formulation of objectives, the selection of relevant materials, and the availability of comprehensive evaluations.

This literature review is expected to serve as a reference for educators in developing teaching materials that are not only tailored to student needs but also nationally standardized. Thus, the development of teaching materials can be part of improving the overall quality of education (Prastowo, 2012). The literature also shows that the use of educational technology can enrich the components of teaching materials and facilitate the integration of educational standards. In the digital era, interactive, multimedia, and digital platform-based teaching materials are part of effective learning strategies. However, challenges such as limited facilities and teachers' digital competencies remain obstacles that need to be overcome. This literature review will also highlight how the development of digital teaching materials can still refer to applicable educational standards (Rusman, 2012).

Against this backdrop, it is crucial to conduct a systematic literature review to explore the forms of instructional material components that meet standards and how their development practices are implemented in various contexts. Through this mapping, this paper will present key findings from relevant studies and

provide recommendations for the development of standards-based instructional materials that are applicable to education practitioners. The ultimate goal is to contribute to improving the quality of learning in schools and other educational institutions (Sugiyono, 2017). Overall, this background emphasizes the urgency and relevance of a literature review regarding the alignment of instructional material components with educational standards. By using educational standards as a benchmark, it is hoped that the development of instructional materials will be more systematic, measurable, and have a direct impact on improving student learning outcomes. This paper will focus on exploring theories, models, and practices of instructional material development, while also providing a comprehensive overview of the ideal quality of instructional material implementation (Trianto, 2010).

METHOD

This research was conducted using a literature review approach, a research method that emphasizes the exploration, collection, and analysis of data from various relevant library sources. Literature review is especially important when researchers seek to understand a phenomenon based on previous theories and findings. In this context, the approach focuses on an in-depth analysis of the alignment between teaching materials and educational standards. Such research requires diligence and precision in selecting and interpreting references, as well as sharp analytical skills. Literature review can also help formulate a strong theoretical foundation for further field-based research (Creswell, 2012).

The literature review approach requires a systematic approach, from issue identification and relevant literature collection to in-depth content analysis. In this study, researchers sifted through various academic documents, such as scientific articles, educational journals, and textbooks discussing teaching materials development and educational standardization. The goal was to obtain a comprehensive overview of how teaching material components, such as content, delivery strategies, and evaluation tools, align with the applicable national curriculum provisions (Ridwan, 2020).

The data collected came entirely from secondary sources that had been selected based on their credibility and relevance to the research topic. These sources included national and international scientific journals, research reports, academic books, and articles from official educational institution websites. The use of secondary data enabled researchers to examine trends, challenges, and successes in teaching materials development practices across various educational contexts (Moleong, 2013). Data analysis in this study began with a data reduction process, which involved selecting and filtering key theories from references most closely related to the research objectives. The reduced data was then systematically organized in narrative and tabular formats to facilitate understanding. This step was crucial to ensure that the information obtained was not merely a collection of quotations but rather formed a comprehensive and integrated conceptual understanding (M.B. & Huberman, 1994).

The next step is data presentation, which is structured to allow for clear exploration and understanding of the relationships between the variables in the study. This presentation takes the form of a summary of findings, a categorization of themes, and an explanation of arguments. This presentation aims to demonstrate the relationship between the components of the teaching materials and the educational standards being analyzed (Sugiyono, 2017).

The research conclusions were drawn through a synthesis process, which involves combining and evaluating various analyzed data and information. This synthesis allows researchers to form logical conclusions based on scientific evidence from various sources. With this approach, the research results are not only descriptive but also provide a critical assessment of teaching materials development practices in Indonesia (O.E.C.D., 2019).

From a literature review approach, we provide a comprehensive picture of how teaching materials development practices can be optimized when grounded in a thorough understanding of applicable educational standards. Furthermore, the study's findings demonstrate the importance of active involvement by teachers, curriculum designers, and educational institutions in ensuring that the components of the developed teaching materials truly meet student needs (Kemendikbudristek, 2022b).

By integrating various perspectives from academic sources, this research can provide conceptual contributions to the evaluation and improvement of teaching materials development. Literature-based research like this can also serve as a starting point for field research aimed at evaluating the implementation of teaching materials directly in schools. The final results are expected to enrich educational practices and assist policymakers in determining a more effective direction for curriculum development.

RESULTS AND DISCUSSION

The form and structure of teaching material components developed in various literature studies

Teaching materials are a crucial component in the learning process, serving as both a guide and the primary learning resource for students. Various literature studies reveal that teaching materials can take various forms, including modules, textbooks, student activity sheets (LKS), and e-learning. Each form of teaching material has a unique structure, tailored to the goals, objectives, and characteristics of the students. Learning modules, for example, generally consist of an identity, instructions for use, learning objectives, materials, practice questions, summaries, and evaluations. Meanwhile, textbooks are often more concise and present information in a systematic narrative format. In a digital context, teaching materials can take the form of interactive multimedia that presents content in visual, audio, and text formats. The structure of these teaching materials also considers pedagogical principles such as learning motivation and the meaningfulness of the material. Therefore, the form and structure of teaching materials are dynamic and contextual. This suggests that in developing teaching materials, literature studies provide a broad reference for selecting an appropriate form and structure (Arsyad, 2015). The structure of teaching materials is determined not only by their form but also by the development approach.

Literature studies indicate that the approach used can be thematic, scientific, or problem-based. This approach determines the sequence and content of the components of teaching materials. In a scientific approach, for example, teaching materials are developed based on the steps of observing, asking, trying, reasoning, and communicating. This directly influences the structure of the material content and learning activities within the teaching materials. Meanwhile, a problem-based approach prioritizes case presentation and the stimulation of critical thinking at the beginning of the teaching materials. Therefore, the structure of teaching materials in literature studies is not rigid, but follows the chosen pedagogical approach. Researchers and teaching materials developers need to consider this approach to ensure that the resulting structure aligns with students' learning needs. This overall approach demonstrates that the structure of teaching materials is largely determined by the underlying strategies and approaches (Trianto, 2010).

One common structure of teaching materials widely referenced in the literature consists of an introduction, main points, and conclusion. The introduction typically includes learning objectives, a concept map, and motivation or introduction to the topic. The main points include a systematic presentation of the material, complete with examples, illustrations, and learning activities. The conclusion contains a summary, reflection, and evaluation of the learning. In the context of developing an independent curriculum, this structure can be further developed more flexibly, for example by adding spaces for exploration or projects. These additions aim to provide space for creativity and active student involvement. This structure also facilitates teachers in implementing effective learning. A clear structure also supports consistent delivery of material across classes. Thus, this standard structure serves as a basic reference in the development of modern teaching materials (Majid, 2011).

In other literature, the structure of teaching materials is often recommended to accommodate four main components: core competencies, achievement indicators, main material, and evaluation. These four components serve as a basic framework for developing targeted teaching material content. Core competencies serve as the starting point for determining the direction of learning. Achievement indicators more specifically outline the skills or knowledge that must be mastered. Main material is the main content that supports the achievement of these indicators, and evaluation is used to measure learning achievement. This structure allows teachers to adapt teaching materials to the applicable syllabus. Furthermore, this structure is considered systematic and relevant for use at various levels of education. Therefore, many teaching material developers have adopted this structure in designing their products (Mulyasa, 2013).

The components of teaching materials in the digital era have also evolved in terms of form and structure. Various literature shows that digital-based teaching materials such as e-books and learning management systems (LMS) have a more modular and interactive structure. Each module or section is usually equipped with multimedia links, interactive quizzes, and discussion forums. This structure not only presents material textually but also provides a more varied learning experience. Interactivity is a key element in the structure of digital teaching materials because it supports active student engagement. Furthermore, the modular structure allows flexible learning access, anytime and anywhere. Therefore, contemporary literature studies emphasize the importance of technology integration in the structure of teaching materials. Adapting to this technology encourages the structure of teaching materials to be more responsive to current developments (Clark & Mayer, 2016).

Some literature also emphasizes the importance of incorporating values and character components into the structure of teaching materials. These components are typically included in the learning activities or reflection sections. The goal is to internalize values such as honesty, cooperation, and responsibility during the learning process. Teaching materials with an affective dimension are considered more effective in shaping students' personalities. Structures that integrate character education generally present real-life situations or case studies that stimulate discussion and critical thinking. This enriches the teaching materials not only cognitively, but also emotionally and socially. Therefore, the structure of current teaching materials is recommended to address not only academic aspects but also moral aspects. Recent educational literature also emphasizes that character education should be an integral part of teaching materials (Zubaedi, 2011). The structure of teaching materials is also often linked to specific instructional design models, such as ADDIE (Analysis, Design, Development, Implementation, Evaluation). In this context, the teaching materials developed will follow the stages of needs analysis, content design, material development, implementation, and evaluation. Each stage contributes to the final structure of the teaching materials. For example, during the design stage, the content structure and logical sequence between sections of the material are developed. The implementation stage serves as a platform for testing and revising the structure to suit real-world classroom conditions. Thus, the structure of teaching materials is not simply a table of contents, but rather the result of a thorough instructional design process.

Many literature studies recommend the use of the ADDIE model because it is considered comprehensive and applicable in developing teaching materials. This proves that a good teaching material structure always results from a systematic and planned process (Branch, 2009). In addition to content structure, visual aspects and layout are also important parts of teaching material structure according to literature studies. A neat appearance, appropriate use of color, and hierarchical arrangement of information help students understand the material more easily. Good visualizations such as images, diagrams, and tables can strengthen memory and clarify concepts.

Many researchers recommend that each section of teaching materials include graphic elements that support the content. Layout also affects the logical flow of reading materials, so it's important to pay attention to consistency between pages or chapters. In developing digital-based teaching materials, this aspect becomes even more crucial because it relates to navigation and user experience. Therefore, the ideal structure of teaching materials is a combination of systematic content and informative visuals. This reinforces the message that the structure of teaching materials is not only about the content, but also the presentation (Smaldino et al., 2012).

Literature studies also underscore the importance of integration between the components of teaching materials. This means that each part of the teaching materials must support each other and form a coherent whole. For example, learning objectives must align with the learning materials and activities, and be relevant to the form of assessment. Mismatches between these components can lead to confusion in the learning process. Therefore, the structure of teaching materials is structured with the principles of coherence and strong internal interconnections. Some literature suggests creating a matrix of interconnections between these components to ensure alignment. In this way, developers can ensure that the structure of the teaching materials is not only complete but also harmonious. This principle of integration is especially important in thematic or interdisciplinary teaching materials. An integrated structure will provide a more contextual and comprehensive learning experience (Dick et al., 2005).

Overall, various literature studies illustrate that the form and structure of teaching materials are not a single entity, but rather vary according to the context in which they are used. Factors such as educational level, student characteristics, learning approaches, and delivery formats (print or digital) influence how teaching materials are structured. Therefore, teaching material developers must be adaptive to developments in educational theory and practice. The ideal teaching material structure is one that conveys content logically, engagingly, and easily understood, while supporting competency achievement. The appropriateness of content, presentation format, visuals, and evaluation are essential elements that must be met. The literature also emphasizes the importance of ongoing evaluation to ensure the teaching material structure remains relevant and effective. From all this, it can be concluded that teaching material development is a creative and scientific process that must be based on literature and field practice. Therefore, a deep understanding of the form and structure of teaching materials through literature is an important provision for educators (Tomlinson, 2014).

Implementation of the Form and Structure of Teaching Materials in Learning Practice

After understanding the various forms and structures of teaching materials discussed in the literature, the next important step is how these materials are implemented in classroom learning practices and in bold learning. Implementation is not simply transferring the content of the teaching materials into learning activities, but also involves adjusting the learning strategies, media, and approaches used by teachers to ensure the materials function optimally. This process is key to the success of open-ended materials design, which has been designed based on theory and academic references (Majid, 2011).

In the context of classroom learning, teachers play a strategic role in translating the structure of open-ended materials into concrete learning experiences. For example, when using a learning module, teachers not only share it with students but also explain key elements such as learning objectives and how to use the module. This is crucial for students to understand the expected learning flow and be able to use the open-ended materials independently. An ideal module allows students to systematically follow learning activities, from orientation, exploration, elaboration, and evaluation (Rusman, 2012). Furthermore, the implementation of open-ended materials is also influenced by the teacher's learning approach. As explained in the literature review, scientific and problem-based approaches influence the way open-ended materials are structured. In practice, teachers who use a scientific approach will direct students to observe, formulate questions, experiment, reason, and draw conclusions. Therefore, parts of open-ended materials related to exploratory activities require special attention when implemented in the classroom. Teachers can prepare visual aids, experimental media, or additional worksheets to enhance the learning process.

A problem-based approach requires teachers to design triggering situations that challenge students' critical thinking skills. In this regard, open-ended materials, including case studies, open-ended questions, and reflective activities, should be implemented through group discussions or class presentations. This practice not only makes the open-ended materials more "lively" but also encourages students to be more active and participatory in learning (Trianto, 2010). In digital-based learning, such as online learning or blended learning, the implementation of teaching materials has also undergone significant adjustments. Teaching materials are no longer limited to printed formats or physical modules, but have evolved into learning videos, interactive presentations, and digital platforms that enable students to learn flexibly. Teachers are expected to be able to transform printed materials into digital media, for example by creating interactive PowerPoint presentations, explanatory videos, or even online quizzes integrated with the teaching materials. The use of Learning Management Systems (LMS) such as Google Classroom, Moodle, or Edmodo has become an important tool for distributing teaching materials (Arsyad, 2015).

However, the effectiveness of implementing digital learning materials depends heavily on the quality of their design and accessibility. Good design includes an attractive appearance, easy navigation, and content that aligns with learning objectives. Teachers must also ensure that all students can access these materials, especially in the context of the digital divide, which remains a challenge in many regions. Therefore, the principles of universal design for learning (UDL) are an important approach to ensuring that learning materials are inclusive and accessible to all students, including those with limited devices or internet access (Rose et al., 2002). Effective implementation of learning materials also requires regular evaluation. Teachers need to observe the extent to which the learning materials help students achieve learning objectives. This evaluation can be conducted through formative and summative assessments, direct feedback from students, and teacher reflection on the learning process. For example, if many students experience difficulty with a particular section of the material, that section may need to be simplified, provided with additional explanations, or its presentation changed. This demonstrates that the implementation of learning materials is a dynamic process that requires continuous adaptation (Mulyasa, 2007).

Collaboration between teachers and educational staff is also key to optimizing the implementation of teaching materials. By working together, teachers can exchange ideas, share effective teaching materials, and reflect on best practices in learning. For example, in teacher learning community programs or teacher working groups (KKG), teachers can discuss the structure of the teaching materials they have used and how they impact student learning outcomes. This collaboration enriches teachers' insights and strengthens their capacity to apply meaningful teaching materials (Suyatno, 2020). Furthermore, the implementation of teaching materials must also take into account the local context and student needs. Teachers need to adapt to student characteristics, the learning environment, and local cultural values. For example, in social studies lessons in coastal areas, teaching materials could include case studies on the lives of fishermen, marine management, or local wisdom related to

conservation. This way, students not only understand the material theoretically but are also able to relate it to their daily lives (Tilaar, 2005).

Challenges and Solutions in Developing Digital and Local Context-Based Teaching Materials

In the era of digital and evolving globalization, the development of teaching materials requires not only technological sophistication but also the ability to adapt content to local contexts. This challenge becomes even more complex when teachers are faced with diverse learners, differing access to technology, and evolving socio-cultural dynamics in society. In this situation, the development of teaching materials needs to consider contextual, collaborative, and technology-based approaches to ensure learning remains relevant and inclusive (Mulyasa, 2007). One of the main challenges in developing digital-based teaching materials is the gap in technology access among learners. Not all students have adequate devices or a stable internet connection to access digital teaching materials. This requires teachers to provide alternative teaching materials in various formats, such as printed modules, offline videos, or audio learning, to reach students in various settings (Rose et al., 2002). The principles of Universal Design for Learning (UDL) are an important approach to addressing this challenge by ensuring that teaching materials are accessible to all students, including those with disabilities.

In addition to access challenges, teachers' and students' digital literacy skills are also a determining factor in the development and use of digital teaching materials. Many teachers have not fully mastered the use of digital platforms or learning applications, resulting in less interactive or boring teaching materials. Therefore, ongoing training in the use of learning technology is an urgent solution. The government and educational institutions need to provide regular teacher professional development programs (Suyatno, 2020). In terms of content, teaching material development also needs to integrate local contexts to make them more meaningful for students. Local contexts allow students to connect learning materials with their surroundings, resulting in a deeper and more reflective learning process. For example, in Indonesian language learning, teachers can use folklore or local culture as teaching materials. This not only strengthens understanding of the material but also fosters a love of one's own culture (Tilaar, 2004).

However, integrating local context into teaching materials also presents its own challenges. Teachers are required to conduct small-scale research or collect local data, which requires time and specific skills. In this regard, collaboration between teachers and support from the school community is essential. Teachers can collaborate with community leaders or local institutions to obtain relevant and accurate information. This can also increase community involvement in education (Majid, 2011). Another challenge is how to combine the demands of the national curriculum with the flexibility in developing teaching materials. The curriculum is often perceived as a standard document that limits teacher creativity. In fact, the curriculum can serve as a basic guideline, while teaching materials can be flexibly developed according to student needs and circumstances. Teachers need to be given pedagogical freedom to adapt teaching materials without neglecting the competency achievements specified in the curriculum.

Another solution to address this challenge is the development of an open educational resources bank. With a platform for sharing teaching materials, teachers can access, modify, and disseminate teaching materials tailored to the characteristics of their respective classes. This will ease the burden on teachers in developing materials from scratch and collectively improve the quality of teaching materials. Several national and international platforms already provide this facility, but its utilization still needs to be improved through outreach and training (Rusman, 2012).

To support the development of effective digital and local-based teaching materials, evaluation is a crucial process that cannot be overlooked. Evaluation should be conducted not only on the basis of material accessibility, but also on the effectiveness of the media and the relevance of the context used. For example, video-based teaching materials need to be evaluated for duration, visual appeal, and narrative clarity. Meanwhile, contextual teaching materials should be evaluated to see how relevant the material is to their real lives (Arsyad, 2015).

Ultimately, the development of teaching materials in the modern era must be grounded in a spirit of innovation and a focus on students. Teachers, as developers of teaching materials, are required not only to be creative, but also reflective and collaborative. Digital and local challenges are not obstacles, but opportunities to create learning that is more humane, meaningful, and relevant to the needs of the times. With the support of progressive policies and a supportive education ecosystem, transforming teaching materials for the better is possible (Trianto, 2010).

Challenges and Recommendations for Developing Teaching Materials in Accordance with Educational Standards

Education is not a static process, but rather a continuously evolving system encompassing many dimensions of life. Education extends beyond the delivery of content, encompassing the integration of curriculum, teaching strategies, and instructional materials. These three elements form the basic framework for creating effective learning. Without strong synergy between these elements, the educational process will not produce optimal results. Therefore, understanding the interrelationships between these components is crucial for establishing a quality education system that is relevant to the needs of the times (Tilaar, 2004). Of all the main components of education, instructional materials are one of the most crucial aspects determining the success of teaching and learning. Instructional materials are concrete instruments used by teachers to systematically deliver material and serve as the primary reference for students in understanding the curriculum. They serve as a bridge between theory in the curriculum and classroom practice. Without relevant and structured instructional materials, the learning process can become disoriented and immeasurable (Muslich, 2007).

In Indonesia, the development of teaching materials must align with the provisions of the national curriculum. Both the 2013 Curriculum and the Independent Curriculum require that teaching materials reflect officially established core competencies and learning objectives. Therefore, teachers cannot be careless in developing teaching materials. Curriculum documents serve as the primary reference for ensuring that the material provided aligns with applicable national education standards (Kemendikbud, 2020). However, the reality on the ground is not as straightforward as it appears on paper. Many teachers face challenges when developing teaching materials that align with the curriculum, especially amidst curriculum transitions or limited access to training. Not all teachers receive adequate training to understand the thematic, project, or differentiation approaches recommended in the latest curriculum. This creates a gap between learning planning and implementation (Nugroho, 2023).

Another challenge stems from geographical and socio-economic disparities between regions. Schools in the 3T (frontier, outermost, and disadvantaged) regions often struggle to access the internet, learning resources, or even curriculum-appropriate textbooks. As a result, teachers tend to use outdated or irrelevant teaching materials. This disparity can seriously impact the overall quality of national education (U.N.E.S.C.O., 2021). The use of technology actually opens up significant opportunities to address this issue. Through digital platforms, teachers can access and develop more varied, interactive, and engaging teaching materials. However, in reality, many teachers still lack adequate digital literacy. This prevents the digital transformation in education from being optimal. Therefore, improving technological competency for educators is an urgent need (GTK, 2022).

To address these issues, a national strategy involving various stakeholders is needed. The government needs to strengthen teacher training and facilitate collaboration between educators through learning communities. Teachers need not work alone but can share teaching materials relevant to the local context. This collaborative approach has been shown to improve the efficiency and quality of the materials developed (Kemendikbudristek, 2022a). Finally, it is crucial to establish national standards for teaching materials that are flexible and contextual. These standards should encompass not only content but also pedagogical approaches, relevance to 21st-century needs, and inclusivity. Thus, teaching materials can become a tool for educational transformation that reaches all students in Indonesia fairly and equitably. Quality education can only be achieved if all children, without exception, have equal access to teaching materials (O.E.C.D., 2019).

Challenges in Developing Teaching Materials

One of the main obstacles in developing teaching materials lies in the difficulty in ensuring alignment between the teaching materials and the competencies established in the curriculum. Many teachers experience difficulties in converting basic competencies or learning outcomes into material that is applicable, meaningful, and relevant to the context of students' lives (Majid, 2011). This situation is further complicated by the dynamics of curriculum change, which demands continuous adjustments to teaching materials to ensure they remain relevant and aligned with educational policy directions.

Another equally significant challenge is the diverse characteristics of students within a classroom. Factors such as social background, academic ability level, learning styles, and individual interests create varying learning needs. Unfortunately, uniform teaching materials may not be able to optimally address these needs (Tomlinson, 2014). For example, students with a tendency toward visual learning styles may struggle to understand material presented solely in text. This situation requires teachers to design differentiated teaching materials to accommodate diverse learning preferences.

Furthermore, limited resources are a real problem, especially in schools located in remote areas. Access to technological devices such as computers, internet access, and digital learning resources remains very limited. Teachers who desire to develop multimedia or interactive teaching materials often lack adequate supporting resources (Yamin, 2013). Furthermore, the scarcity of up-to-date scientific references also hampers efforts to develop relevant and reliable materials.

Another aspect worth noting is the time constraints imposed by teachers' heavy workloads. In addition to teaching, teachers are also burdened with various administrative duties, student development activities, and involvement in other school activities. This situation results in a lack of time to develop systematic and innovative teaching materials (Supriatna, 2017), resulting in hastily created materials with minimal evaluation. The low frequency of ongoing professional training in the field of teaching materials development is also a major obstacle. Many educators have not received adequate training in instructional design, the latest pedagogical approaches, and technology integration in learning. As a result, the teaching materials produced tend to be conventional and do not fully reflect active, meaningful, and context-based learning (Mulyasa, 2013).

Strategic Recommendations for Teaching Materials

In facing these various challenges, a number of strategies are needed that can be implemented to improve the quality of teaching materials. *First* It is crucial to conduct a comprehensive curriculum mapping before developing teaching materials. Teachers must thoroughly understand each element of the curriculum, including core competencies, basic competencies, learning indicators, and learning outcomes. This way, the teaching materials developed will have a clear direction and align with national education goals (Kemendikbud, 2021).

Second, to accommodate the differences in student characteristics, teaching materials developers should adopt the principles of Universal Design for Learning (UDL). This principle emphasizes the importance of providing various forms of material representation, providing choices in how to express learning outcomes, and creating various ways to motivate students (C.A.S.T., 2018). For example, presenting material through text, images, audio, and video simultaneously will help students with different learning styles understand the content.

Third, the use of educational technology can be an effective solution for developing interactive and engaging teaching materials. Teachers can use Learning Management Systems (LMS) like Google Classroom, Moodle, or local platforms like Rumah Belajar to distribute teaching materials in various formats. Applications like Canva, Powtoon, and Kahoot can also be used to create more engaging and engaging materials (A. & Firmansyah, 2020).

Fourth, strengthening collaboration between teachers in working groups such as MGMP (Subject Teachers' Consultation) needs to be improved. Through this collaboration, teachers can exchange ideas, develop teaching materials together, and conduct trials of the developed materials. This collaboration can also serve as a forum for sharing good practices and collectively improving competencies (Widodo, 2016).

Furthermore, it is important for teachers to regularly evaluate the teaching materials they have used. Evaluation can be carried out through formative assessments, observations of the learning process, or reflective discussions with colleagues. Student input is also invaluable in determining the extent to which teaching materials support effective learning. Periodic revisions will ensure that teaching materials remain relevant and adaptable to the dynamics of learning needs (Anderson & Krathwohl, 2001).

Fifth, is increasing access to professional training facilitated by the government and educational institutions. This training should be practical, sustainable, and relevant to real-world needs, including mastery of the latest curriculum and utilization of educational technology. Equal access to training across regions is crucial to ensuring equality in educational quality (Kemendikbudristek, 2022a).

Developing teaching materials aligned with national education standards is a crucial element in creating a quality learning process. These standards serve not only as an administrative reference but also as a foundation for determining the direction of student learning outcomes. Teaching materials are a tangible manifestation of the curriculum vision implemented in schools, whether the 2013 Curriculum or the Independent Curriculum. When teaching materials align with the curriculum, the learning process becomes more focused, structured, and tailored to student needs (Muslich, 2007). Despite the strategic role of teaching materials, numerous challenges remain in practice that hinder their development. One major issue is the mismatch between the content of teaching materials and the current learning approaches outlined in the national curriculum. Teachers are sometimes unable to develop teaching materials that reflect competency-

based, project-based, or differentiated learning. This is due to a lack of systematic professional training and support for teachers in understanding the curriculum in depth (Nugroho, 2023).

Another challenge lies in the diversity of students. Each student has a different background, abilities, and learning style. Therefore, developing teaching materials cannot be done with a one-size-fits-all approach. Using a differentiated approach is crucial so that teaching materials can accommodate students' individual learning needs. Teachers need to develop a variety of materials, activities, and learning media to reach all types of students equitably (Tomlinson, 2014). Furthermore, limited facilities and infrastructure are also a significant obstacle to the development of teaching materials, especially in 3T (Disadvantaged, Frontier, and Outermost) regions. Many schools still lack basic facilities such as internet access, computers, and supporting books. This condition makes it difficult for teachers to access the latest learning resources or use technology as a medium for delivering teaching materials. This gap widens the disparity in education quality between regions in Indonesia (U.N.E.S.C.O., 2021).

Another crucial issue is the limited opportunities for teachers to participate in ongoing professional training. However, teacher competency in developing and evaluating teaching materials cannot be developed instantly. Many teachers are forced to develop learning materials independently without expert guidance, resulting in suboptimal quality. Structured and ongoing training is necessary to enable teachers to develop relevant, inspiring, and contextual teaching materials (GTK, 2022). Therefore, teaching material development must be designed with a holistic and adaptive strategy. This strategy includes a comprehensive understanding of the curriculum, the application of a differentiated approach, the use of digital technology, collaboration between teachers, and ongoing evaluation of teaching materials. A comprehensive understanding of the curriculum helps teachers ensure that each teaching material they develop aligns with the learning outcomes set by the government.

The use of information technology in developing teaching materials is also a key factor in today's digital era. Technology offers numerous opportunities for teachers to enrich learning materials with visual, audio, interactive, and multimedia resources. E-learning, instructional videos, and online quizzes are part of modern teaching materials that can increase student motivation and retention. However, the success of technology integration depends heavily on teachers' digital literacy and the readiness of school infrastructure (Setiawan & Mahfud, 2022).

Therefore, collaboration between teachers and government support are key prerequisites for creating quality teaching materials. Teachers can share best practices within learning communities, develop teaching materials together, and engage in pedagogical reflection. Meanwhile, the government needs to provide platforms, incentives, and policies that support innovation in teaching materials development. With strong synergy, teaching materials will not only meet national standards but also serve as instruments that enrich the teaching and learning process as a whole.

CONCLUSION

Developing teaching materials aligned with national education standards is a key element in creating a quality learning process that is relevant to students' needs. Through a literature review, this journal emphasizes that teaching materials are not merely a collection of materials, but also an integral part of a systematic, structured, and adaptive educational strategy to curriculum changes, such as the Independent Curriculum. Ideal open materials components include learning objectives, materials, learning activities, evaluations, and learning media, all of which must be integrated and refer to competency standards. The structure of open materials should not be rigid, but rather flexible and responsive to student characteristics, especially in facing the challenges of 21st-century learning. Scientific, competency-based, thematic, and Universal Design for Learning (UDL) approaches are important references in developing contextual and inclusive teaching materials.

Teachers face various challenges in the field, such as limited access to technology, high workloads, low digital literacy, and gaps in ongoing professional training. These realities mean that the development of teaching materials does not fully reflect the direction of national education policy. On the other hand, regions in the 3T (underdeveloped, frontier, and outermost) also still experience gaps in access to learning resources. Therefore, this journal recommends a strategy for developing teaching materials that includes a thorough understanding of the curriculum, collaboration between teachers, the use of educational technology, continuous evaluation of teaching materials, and equitable professional training. The government, educational

institutions, and the teacher community must work together to create an educational ecosystem that supports innovation in open materials. Overall, the development of standardized, adaptive, and literature-based teaching materials is the foundation for improving the quality of national education. With a clear structure, appropriate approach, and appropriate technology, teaching materials can be an effective bridge to realizing meaningful learning achievements for all students in Indonesia.

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