

## Instructional Design and Digital Platforms in the Development of Local Wisdom-Based Social Studies Learning Materials: A Systematic Review

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### ABSTRACT

*The integration of local wisdom into digital learning materials is a strategic approach to strengthening cultural literacy and character education in social studies learning. However, variations in instructional design models and digital platforms have resulted in different levels of pedagogical and cultural effectiveness. This study aims to examine how instructional design models influence the development process and to identify the most effective digital platforms and media for delivering culturally based materials. A Systematic Literature Review (SLR) was conducted using the PRISMA protocol and analyzed through the PICOS framework. The findings reveal that the ADDIE model is most widely implemented due to its flexibility and iterative evaluation process, followed by Borg & Gall, Dick & Carey, and the 4D model, each supporting product validation and pedagogical relevance. Additionally, e-modules and interactive multimedia are the most effective platforms for improving conceptual literacy, while mobile applications and e-learning platforms enhance accessibility and interactivity.*

### Keywords:

Local Wisdom; Digital Learning; Instructional Design; Platform Digital.

### ABSTRAK

*Penelitian ini bertujuan untuk: 1) Menginovasi model pembelajaran menggunakan Value Clarification Technique (VCT) yang berorientasi pada peningkatan literasi digital siswa untuk menumbuhkan nilai-nilai kebangsaan di Sekolah Menengah Pertama Negeri/SMPN 4 Sengkang, dan 2) Mengidentifikasi kendala dalam penerapan model pembelajaran inovatif ini untuk mempromosikan literasi digital dan nilai-nilai kebangsaan di Sekolah*

*Integrasi kearifan lokal dalam sumber belajar digital menjadi strategi penting dalam memperkuat literasi budaya dan pendidikan karakter pada pembelajaran IPS. Namun, variasi dalam model desain instruksional dan platform digital telah menghasilkan tingkat efektivitas yang berbeda dalam hasil pedagogis dan budaya. Penelitian ini bertujuan menjelaskan model desain instruksional memengaruhi proses pengembangan, dan platform dan media digital paling efektif untuk menyampaikan bahan tersebut. Metode penelitian yang digunakan adalah LSR dengan protokol PRISMA, analisisnya melalui kerangka PICOS. Hasil menunjukkan bahwa 1). Model ADDIE adalah model yang paling banyak diadopsi karena fleksibilitas dan evaluasi interaktifnya, diikuti Borg & Gall, Dick & Carey, dan model 4D, masing-masing berkontribusi pada aspek tertentu dari validasi produk, ketepatan pedagogis, dan difusi. 2). Platform digital yang paling efektif digunakan adalah e-modul dan multimedia interaktif karena dapat meningkatkan literasi konseptual, aplikasi seluler dan platform e-learning memfasilitasi interaktivitas dan aksesibilitas.*

**Kata kunci:**

Kearifan Lokal; Pembelajaran Digital; Desain Instruksional; Platform Digital.

## 1. Introduction

The development of digital technology has a significant impact on the advancement of the world of education (Saykili, 2019; Timotheou et al., 2023). One of these impacts is the capability to adapt to rapid changes. The learning trend in the digital era refers to the flexible time of implementation, allowing it to be done anytime and anywhere, unrestricted by space and time (Liza & Andriyanti, 2020; Huang, 2024; Ningsih et al., 2025). Therefore, education is demanded not only to observe technological developments but must also be able to adapt and innovate through digital technology. Furthermore, the advancement of digital technology also contributes to the erosion of local culture, especially among the younger generation who show a greater preference for foreign cultures. This is relevant to the findings of Gangsim Eom's research, which states that 53.5% of Indonesians are familiar with Korean culture, while 27.2% consider Indonesian local culture to be very foreign. Based on this data, it can be concluded that a portion of the Indonesian population is starting to lose recognition of their own local culture and prefers to consume foreign culture. For this reason, it is necessary to integrate local culture into daily life. One effective platform for this is through education. Thus, technological advancements can be utilized in education by integrating local culture or local wisdom, simultaneously presenting contextual learning. Subsequently, it is crucial to ensure that students can access contextual learning resources more easily. Digital transformation in education has encouraged the development of various types of digital teaching materials as part of learning innovation (Nurhamid, Murtono, & Utaminingsih, 2021; Autthawuttikul, Laisema, & Bangtamai, 2022; Indawati, Sulistyowati, Tri, Andariana, & Sari, 2024; Fadhli, Suharyadi, Firdaus, & Bustari, 2023). This advancement also necessitates the contextualization of learning content to make it more relevant and meaningful to students' daily lives (Kertih, 2020; Autthawuttikul et al., 2022). The

digital transformation of teaching materials, which are capable of integrating them with local wisdom and local cultural identity.

Social Studies (IPS) learning, as a subject that emphasizes the understanding of society, culture, and human values, holds a strategic role in integrating the values of local wisdom into the learning process (Widodo & Sugeng, 2022; Supriatna, 2016; Gaudelli & Laverty, 2018; Udayani, 2020; Nurhamid et al., 2021). The need to link learning materials with local values, culture, and traditional wisdom is becoming increasingly important in efforts to shape students' cultural literacy and character. According to Banks, as cited in Candra (Candra et al., 2021), Cultural Literacy is the ability to understand, appreciate, and interact effectively with one's own culture as well as other cultures. Furthermore, cultural literacy encompasses the ability to interpret and reflect on cultural meanings in various forms of expression, including traditions, language, symbols, and works of art, as well as the skill to appreciate cultural diversity. One approach that can be used to increase student engagement and cultural literacy in Social Science learning in the digital era is the development of local wisdom-based digital teaching materials. Many research findings have already been conducted on the development of local wisdom-based teaching materials in Social studies learning. According to Banks, as cited in Candra (Candra et al., 2021; Muhtadin et al., 2024), Cultural Literacy is the ability to understand, appreciate, and interact effectively with one's own culture as well as other cultures. Furthermore, cultural literacy encompasses the ability to interpret and reflect on cultural meanings in various forms of expression, including traditions, language, symbols, and works of art, as well as the skill to appreciate cultural diversity. One approach that can be used to increase student engagement and cultural literacy in Social Science learning in the digital era is the development of local wisdom-based digital teaching materials. Many research findings have already been conducted on the development of local wisdom-based teaching materials in Social Science learning.

As the utilization of technology in education increases, various forms of digital teaching materials, such as interactive e-books, educational videos, learning applications, and Learning Management Systems (LMS), are beginning to be widely used (Bivic, 2023; Marcus-Quinn, 2022; Ramdhani et al., 2024). Nevertheless, integrating local wisdom content into digital formats is not an easy matter. Local wisdom is often contextual, narrative, and sometimes based on direct practices that are difficult to fully represent through digital media. On the other hand, the development of meaningful and effective digital materials requires an appropriate instructional design approach so that cultural meaning is not only conveyed but also deeply understood by students (Siska & Supriatna, 2021; (Sutimin, 2025; Siska et al., 2025; Sukadari et al., 2023). There has been extensive development of digital learning materials based on local wisdom using various instructional designs and digital platforms. However, an in-depth analysis is needed to determine which platforms are most effective for developing such materials, as well as to identify instructional design models that are appropriate and relevant to the selected media or platforms. Therefore, this study is expected to provide clearer guidance, enabling future researchers to more easily select suitable instructional designs and digital platforms for the development of culturally grounded learning materials.

Several previous studies have highlighted the urgency of developing local wisdom-based teaching materials in Social Science learning. However, the findings of prior literature reviews tend to remain general and have not specifically explored how instructional design models affect the

effectiveness of these digital teaching materials, or which digital media and platforms are most effective in conveying local wisdom content to students. Some Systematic Literature Reviews (SLR) that have been written, such as the one by Rizal, et al. (2025), titled “Teaching Materials of Local Wisdom-Based E-Book in Digital Learning: A Systematic Literature Review”, and another by (Jumriani et al., 2021), titled “The Urgency of Local Wisdom Content in Social Studies Learning: Literature Review”, primarily address the content or urgency of local wisdom integration. However, these studies stop short of systematically and critically examining the role of instructional design approaches and the selection of appropriate digital technologies.

Therefore, the research formulates two research questions (RQs): 1). How do instructional design models influence the development of local wisdom-based digital learning materials in Social Studies education? 2). What types of digital platforms and media are most effectively used to deliver local wisdom-based learning materials in Social Studies education? Based on the two RQs above, the objectives of this research are to explain the instructional design models used in the development of local wisdom-based digital teaching materials in Social Studies learning and to classify the types of digital media and platforms that are most effective in delivering local wisdom-based teaching materials in the context of Social Studies education.

## 2. Methods

### 2.1 Research Design

This study employed a Systematic Literature Review (SLR). An SLR is a literature-based research approach that synthesizes all empirical evidence meeting pre-established eligibility criteria to answer specific research questions (Kurdi, 2020; Linares-Espinós et al., 2018). The review process in this study followed the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). The PICOS framework was applied to formulate eligibility criteria and guide the study selection process (Schmidt, 2025). The scope of the review was derived from the two research questions outlined in the introduction. Articles included in the analysis were retrieved from the Google Scholar database using the Publish or Perish software, with the publication period restricted to 2020–2024. The selection criteria focused on articles concerning the development of digital teaching materials based on local wisdom, Social Studies education, and instructional design. Collectively, the research theme aligns with educational research articles pertinent to the title of this study.

### 2.2 Eligibility Criteria (PICOS)

The eligibility of articles in this review was determined using the PICOS framework (Population, Intervention, Comparison, Outcomes, and Study design). This framework was applied to establish clear inclusion and exclusion parameters, ensuring that only the most relevant studies were considered for analysis. The elimination process based on PICOS is summarized in Table 1.

**Table 1.** Article Elimination Through PICOS Parameters

<b>Component</b>	<b>Operational Definition</b>	<b>Inclusion</b>	<b>Exclusion</b>
<b>P (Population)</b>	Context of Social Studies (IPS) education at elementary, junior high, senior high school, and higher education levels.	Studies in Social Studies (IPS) examining students, teachers, or learning materials.	Studies outside Social Studies (e.g., pure sciences, mathematics, engineering).
<b>I (Intervention)</b>	Development of digital learning materials based on local wisdom using instructional design models.	Studies on digital learning materials integrated with local wisdom and applying instructional design models (e.g., ADDIE, 4D, Dick & Carey, R&D).	Non-digital learning materials or digital learning without local wisdom integration.
<b>C (Comparison)</b>	Comparison across instructional design models or digital platforms/media (if available).	Studies comparing the effectiveness of instructional design models or digital platforms.	Studies without comparison (purely descriptive or opinion-based).
<b>O (Outcome)</b>	Outcomes related to effectiveness, quality, learning engagement, cultural literacy, character values, or implementation of learning materials.	Studies reporting the results of implementing digital learning materials based on local wisdom.	Articles that are purely conceptual/theoretical without empirical findings.
<b>S (Study Design)</b>	Empirical studies (quantitative, qualitative, mixed-methods, R&D, quasi-experiments, case studies) and systematic reviews.	Peer-reviewed journal articles indexed in Google Scholar, published in <b>2020–2024</b> , in English or Indonesian.	Grey literature, editorial papers, opinion essays, theses/dissertations, preprints not peer-reviewed.

### 2.3 Data Collection

Data collection in this study was conducted through a systematic literature review guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol. The inclusion and exclusion criteria were applied consistently to ensure that only relevant studies were analyzed.

The inclusion criteria consisted of: (1) articles published within the last five years (2020–2024); (2) studies with titles and keywords relevant to the research focus, including Social Studies (IPS), digital learning materials, and local wisdom integration; and (3) subjects aligned with the scope of

Social Studies education (students, teachers, or instructional materials). Meanwhile, the exclusion criteria included: (1) articles published more than five years ago, (2) titles and subjects irrelevant to the research focus, and (3) grey literature, editorials, and non-peer-reviewed works.

The search and screening process used two main databases, Scopus and Google Scholar, with the assistance of Publish or Perish software. Keywords applied in the search included Social Studies students and teachers, digital learning materials based on local wisdom, digital learning materials, cultural literacy, character development, quantitative research, qualitative research, and research and development (R&D).

#### *2.4 Data Extraction*

The data extracted into the analysis table include the authors' identity (author, year, country), the instructional design model applied, the digital platforms or media utilized, the forms of local wisdom integrated, the main findings on effectiveness, as well as the challenges and implications for Social Studies learning.

#### *2.5 Data Analysis*

The data in this study were analyzed using a qualitative approach through content analysis and thematic synthesis. The analysis process consisted of several stages: (1) familiarization with the data, (2) coding of research findings, (3) grouping sub-themes based on emerging patterns, (4) developing thematic synthesis, and (5) interpretation. The interpretation stage involved constructing a descriptive narrative to highlight research trends, best practices, and existing gaps in the development of local wisdom-based digital learning materials in Social Studies education.

The initial search yielded 200 articles, from which duplicates and irrelevant studies were removed, resulting in 157 articles. After applying the inclusion and exclusion criteria through title, abstract, and full-text screening, a final selection of 15 articles was retained for in-depth analysis. These 15 studies were considered the most relevant to the formulated research questions.

### **3. Results and Discussion**

Consistent with the research questions, this study analyzes the instructional design models employed in the development of local wisdom-based digital teaching materials in Social Studies education. Consequently, the review of articles yielded recommendations for suitable instructional design models for developing Social Studies materials, along with recommendations for effective or commonly used digital media or platforms in digital teaching material development. It is understood by both researchers and readers that not all digital platforms are suitable for developing Social Studies materials integrated with local wisdom. The following section details the research findings:

#### *3.1 Instructional Design Models Influence the Development of Local Wisdom-Based Digital Learning Materials in Social Studies Education*

Following the inclusion and exclusion criteria applied to journal articles indexed in Google Scholar between 2020 and 2024, a total of 15 articles were identified as eligible and relevant. These

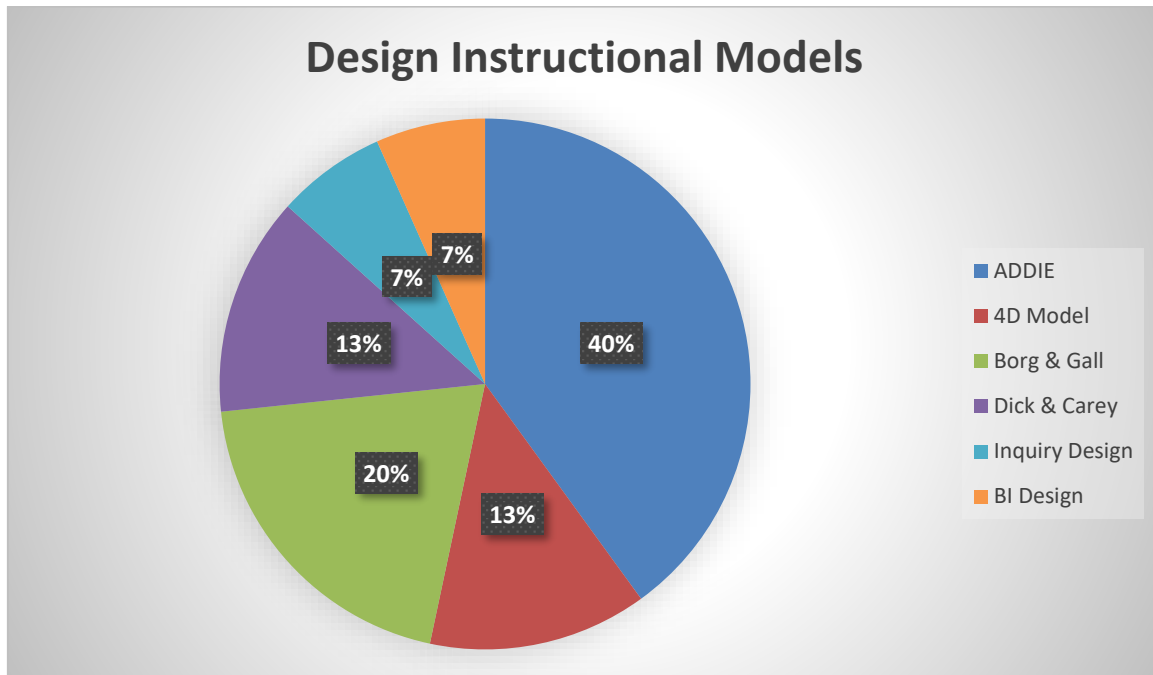
articles were further analyzed in relation to instructional design and digital platforms for developing Social Studies teaching materials based on local wisdom. The results of the review are summarized in the data extraction table below:

**Table 2.** Selected Article Data Extraction Matrix (2020–2024)

No	Author/Year	Article Title	Instructional Design Model	Digital Platform	Local Wisdom Integration	Outcomes & Implications	Research Gaps
1	(Spatioti, Kazanidis, & Pange, 2022)	A Comparative Study of the ADDIE Instructional Design Model in Distance Education	ADDIE	E-learning module	Local traditions in Social Studies	Improved student understanding of Social Studies	Lack of long-term evaluation
2	(Putri & Wiarta, 2024)	Local Wisdom-Oriented Digital Teaching Materials	ADDIE	Interactive multimedia	Local cultural values	Strengthening cultural literacy	Limited studies in junior high school context
3	(Rofi'i, Sumartini, Susilo, & Tundreng, 2023)	Interactive Multimedia Based on Local Folklore	Borg & Gall	Interactive multimedia	Folklore	Fostered character building	Impact on Social Studies not yet measured
4	(Jannah & Rosyidi, 2022)	Development of Digital Comic Learning Media in Social Studies	4D Model	Digital comic	Local stories	Facilitated understanding of Social Studies concepts	Not yet tested in the <i>Merdeka Curriculum</i>
5	Autthawuttikul et al., 2022)	A Place-Based Digital Learning Environment with Learning Resources	ADDIE	E-module	Traditional values	Improved digital literacy	No explicit connection to Social Studies

		Applications to Enhance Student Learning and Innovations					
6	Sari & Yuliani (2022)	E-Module Based on Local Potentials	Borg & Gall	E-module	Local potentials	Increased relevance of learning	Instructional design not discussed in detail
7	(Saripudin, Fauzi, & Nugraha, 2022)	Interactive E-Book of Local History for Digital Literacy	ADDIE	Interactive e-book	Local history	Enhanced digital and cultural literacy	Limited to senior high school context
8	(Ni Komang Manik Mas Safitri, Didith Pramunditya Ambara, & Ni Luh Putu Agetania, 2024)	The Development of Interactive Multimedia Raya Based on Local Wisdom: Fire War in Buduk Village for Pancasila Education Content in Fifth Grade	ADDIE	Interactive multimedia	Buduk Fire War tradition	Fostered Pancasila and Social Studies values	No evidence of long-term effectiveness
9	(Sudarmidin et al., 2020)	Ethnoscience-Based Inquiry Learning Design	Inquiry-based design	Interactive multimedia	Ethnoscience (Taxus sumatrana)	Improved scientific explanation	Not yet adapted to Social Studies

Based on the data extraction table above, it can be observed that the research designs are predominantly represented by the ADDIE model, the 4D Model, the Dick & Carey model, and the Borg & Gall model. These models were employed to assess how their respective stages were adapted in the development of digital teaching materials grounded in local wisdom. To further elaborate on the data extraction and address the research questions, the following section presents the percentage distribution of instructional design models used across the reviewed studies.



**Picture 1.** Percentage of Instructional Design Models in Relevant Articles (2020–2024)

Based on Picture 1, the instructional design model predominantly utilized by researchers in the development of local wisdom-based digital teaching materials for Social Studies education is the ADDIE model, accounting for 40%. According to Fadhli et al. (2023), this model is systematic and sequential, resulting in a more structured developed product. Furthermore, this model allows for evaluation at every stage until the final product is valid for dissemination. This model is also well-suited for development research in the field of education and learning technology. This finding also suggests that the ADDIE model is highly relevant for the development of research on local wisdom-based digital teaching materials, as the creation of teaching materials and digital products requires revision not only during the design and validation phases but also, at times, post-implementation to accommodate field conditions and findings.

Subsequently, the second most frequently used model is Borg & Gall at 20%, followed by Four D and Dick and Carey models, each accounting for 13%. Lastly, the Inquiry Design and BI Design models account for 7%. This data indicates that there is actually no single overly dominant model, but rather the choice is tailored to the specific development needs and the digital platform being utilized.

### *3.1.1 Instructional Design Models Utilized*

This article reviews the instructional design models most frequently employed in research on the development of digital learning materials based on local wisdom. The majority of studies applied the ADDIE model (Analysis, Design, Development, Implementation, Evaluation) as the primary framework (Putri & Wiarta., 2024; Saripudin et al., 2022; Ni Komang Manik Mas Safitri et al., 2024; Spatioti et al., 2022; The Borg & Gall model was also widely adopted (Rofi'i et al., 2023; Saddhono, 2020) diikuti Dick & Carey and 4D Model (Indawati et al., 2024). Several studies combined a blended instructional design approach (Indawati et al., 2024) or inquiry-based design (Sudarmin et al., 2020).

Based on the reviewed articles, the tendency to employ this instructional design model can be explained by several reasons: (a) the analysis stage facilitates the identification of students' needs and the local cultural context; (b) the design and development stages allow for the adaptation of digital materials to incorporate elements of local wisdom, such as folklore or traditional social practices; and (c) the implementation and evaluation stages ensure the effectiveness of the teaching materials from both pedagogical and technological perspectives.

Additionally, the influence of employing the ADDIE model on the developed products suggests that its use facilitates a more systematic integration of local wisdom. However, it tends to produce instructional materials that are linear and less flexible in accommodating classroom dynamics. Consequently, most development studies adopted the ADDIE model, as it was considered appropriate and well-aligned with their intended objective.

The dominance of the ADDIE model in the reviewed studies suggests that it is considered the most adaptable in accommodating the needs of digital and locally wisdom-based instructional design. This finding is consistent with previous literature emphasizing the flexibility of ADDIE across diverse educational contexts. However, the excessive reliance on ADDIE may lead to research patterns characterized by uniform design and limited methodological innovation. Therefore, incorporating alternative models such as Dick & Carey or inquiry-based design could provide richer pedagogical approaches.

### *3.1.2 Alternative Models: Borg & Gall, Dick & Carey, 4D, and Conventional Design*

Several studies employed the Borg & Gall model, which emphasizes the selection of digital media in alignment with student characteristics. This model is more explicit in linking technology with culturally based Social Studies learning processes. In addition, some studies integrated Problem-Based Learning (PBL) by utilizing the Dick & Carey design to connect local wisdom with the resolution of social problems. For instance, students were encouraged to address environmental issues by drawing upon traditional knowledge. Although this model differs from the primary purpose of development-oriented models, such as ADDIE and the 4D Model, which are predominantly applied in research and development methods, PBL is positioned as an instructional method. In this review, the focus is on how PBL can bridge local wisdom with problem-solving in educational contexts.

In addition, the socio-cultural approach integrates Vygotskian theory, enabling digital learning materials not only to deliver local content but also to foster student collaboration in understanding cultural values. The impact of this alternative model lies in its ability to broaden the scope of local wisdom integration, positioning it not merely as instructional content but also as a contextual and participatory learning method.

### *3.1.3 Types of Digital Platforms and Media Are Most Effectively Used to Deliver Local Wisdom-Based Learning Materials in Social Studies Education*

Based on the synthesis analysis of the research findings regarding the platforms and media employed in the development of learning, the following is a synthesis overview of RQ2 as presented in the table below.

**Table 3.** Synthesis of Findings for RQ2: Digital Platforms and Media

<b>Digital Platform/Media</b>	<b>Application in Local Wisdom-Based Social Studies</b>	<b>Advantages</b>	<b>Limitations</b>
LMS (Moodle, Google Classroom)	Structured distribution of local culture learning materials	Facilitates monitoring and formal interaction	Less immersive, limited learning experience
Digital E-Modules & Mobile Learning	Digital modules containing text, images, animations, and cultural stories	Flexible, easily accessible, supports independent learning	Less interactive compared to multimedia
Interactive Multimedia	Combination of text, audio, video, and animations for local culture	Enhances student motivation and engagement	Requires adequate devices
Augmented Reality (AR)	3D representations of cultural artifacts and historical sites	Provides immersive and contextual learning experiences	High cost, limited accessibility
Digital Storytelling (YouTube, video apps)	Student production of cultural stories	Improves cultural literacy and creativity	Requires video editing skills
Social Media/Blogs	Sharing cultural practices and narratives	Broad accessibility, potential to reach wider communities	Not all teachers are ready to integrate effectively

The digital products developed include e-learning modules, interactive multimedia, mobile applications, digital comics, digital storytelling, and ICT platforms. This variation highlights a tendency toward cross-media experimentation to accommodate student needs and local contexts. However, most studies remain at the initial development stage and have not yet measured long-term effectiveness on a broader scale.

The findings reveal a diversity of media and platforms employed in the development of digital teaching materials based on local wisdom for Social Studies. E-modules and interactive multimedia have been shown to be effective in enhancing conceptual literacy, while mobile applications and e-learning platforms are more frequently utilized to promote interactivity and learning connectivity.

Thus, the effectiveness of media appears to vary depending on the learning objectives: e-modules are superior in fostering conceptual literacy, mobile applications excel in promoting interactivity, and local wisdom-based storytelling is particularly effective in developing character and cultural literacy.

Based on the above findings, the researcher analyzed the types of media employed in these studies and concluded that no single platform is inherently superior or prioritized; rather, their effectiveness is highly dependent on the specific instructional objectives. For example:

- 1) E-modules and interactive multimedia are effective in building conceptual understanding in Social Studies due to their systematic content structure.
- 2) Mobile applications and e-learning platforms emphasize accessibility and interactivity, aligning well with the learning styles of digital-native students.
- 3) Digital storytelling, comics, and local culture-based videos are particularly effective in internalizing values, fostering character development, and enhancing cultural literacy.
- 4) Blended platforms hold the potential to provide richer learning experiences by integrating the strengths of both digital and face-to-face instruction

These findings are consistent with the TPACK framework (Technological, Pedagogical, and Content Knowledge), which emphasizes the importance of integrating technology, pedagogy, and local content in a harmonious manner. This implies that the effectiveness of media is not merely determined by the platform itself, but by how the platform is integrated with the instructional design model and the content of local wisdom.

Furthermore, integrating digital Social Studies teaching materials with local wisdom enhances the relevance of Social Studies learning to the students' social and cultural context. The presence of local wisdom-based teaching materials helps students recognize, understand, and appreciate their own cultural roots. This is crucial for building a cultural identity and fostering a sense of pride in one's cultural heritage. Additionally, local wisdom typically encompasses moral values such as cooperation (gotong royong), honesty, deliberation (musyawarah), diligence, and responsibility. The integration of these values into teaching materials contributes to character development, aligning with the direction of national education policy. These teaching materials also leverage students' social experiences, thereby increasing their interest and motivation to learn, as they perceive the learning content to be relevant to their lives and environment.

#### **4. Conclusion**

This systematic review demonstrates that the development of digital teaching materials based on local wisdom in Social Studies education is shaped by two key determinants: the instructional design model and the choice of digital platform or media. The findings indicate that models such as ADDIE, Borg & Gall, Dick & Carey, and the 4D Model offer structured frameworks that support the integration of cultural values into digital content. Among these, ADDIE is the most widely applied due to its flexibility and iterative evaluation process. Each model contributes distinctly to product validation, pedagogical alignment, and dissemination, suggesting that instructional design selection plays a critical role in ensuring both pedagogical quality and meaningful cultural representation.

Furthermore, the effectiveness of digital platforms varies according to learning objectives. E-modules and interactive multimedia yield stronger outcomes in developing conceptual literacy. Mobile applications and e-learning environments enhance interactivity and accessibility, while storytelling-based media more strongly support cultural identity and character formation. These results reinforce that the success of culturally grounded digital materials relies not merely on

technological availability, but on the alignment between instructional design, media selection, and local wisdom content. Future research is needed to explore a broader range of instructional design models and methodological approaches, considering the limited design variations identified in existing studies.

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