Social studies teachers' knowledge and criteria for selecting and utilizing instructional materials in teaching and learning

Anthony Bordoh*

Department of Social Studies Education, University of Education, Winneba, Ghana

Introduction: This study explored the understanding and application of principles for selecting and using instructional materials by Social Studies teachers in Senior High Schools within the Mfantsiman Municipality. The study was grounded in the ASSURE model.

Methods: Qualitatively, a literal replication multiple case study research design was employed. The study population consisted of Social Studies teachers from three selected schools, and a sample of eight teachers were included. The data were gathered through interviews and analyzed thematically.

Results and discussion: The study revealed that the teachers' awareness of instructional material principles reflects their ability to align these materials with student needs and instructional objectives, indicating a strong foundational knowledge base essential for effective teaching and learning of Social Studies. The teachers' material selection aligns well with curriculum objectives and student needs; however, this process often relies on subjective judgment rather than standardized evaluative tools, which could lead to inconsistencies in instructional quality. Professional Learning Community meetings should strengthen teachers' understanding of selecting and using instructional materials effectively, emphasizing their practical application in diverse classroom settings. Social Studies teachers are also recommended to develop guidelines and checklists to standardize the selection of instructional materials, incorporating inclusivity, cultural sensitivity, subject matter, and resource availability as key criteria.

KEYWORDS

social studies, knowledge, utilization, teacher, instructional materials

1 Introduction

Teaching is a profession, and all who desire to belong to the profession should be well grounded in the art of teaching; they need to be conversant with the philosophy guiding the educational enterprise of the country in which they intend to practice and need to have mastery of the subject specialized, or for which they are trained. A teacher is expected to plan his lesson(s) ahead of class. During the planning stage, they consider the behaviors relevant to their teaching task and the instructional materials to employ, given the instructional objectives. Teachers are tasked with consciously educating, teaching, and guiding students. A teacher should be able to choose and even develop appropriate instructional materials and resources and organize or manage the classroom to enable optimal learning, ultimately achieving lifelong learning independence, which is the ultimate goal of the educational process. The use of instructional materials helps

the process of delivering messages from teachers to students. The selection of these materials requires the use of a model based on specific principles and criteria to choose effective, accessible, and meaningful instructional materials precisely. The purpose of using instructional material is to make it easier for students to master the learning competencies that have been set (Tafonao and Purba, 2021). Tafonao and Purba (2021) stated that "instructional materials are irrelevant when they do not stimulate retention in the learner and have no immediate relevance to the learner's immediate or remote needs".

Instructional materials are also vital educational inputs for successfully implementing any curriculum. Relevant and appropriate textbooks, as well as visual and audiovisual materials such as globes, charts, slides, maps, and audio recordings, are essential in the teaching-learning process. Audiovisual materials supplement and consolidate what is read in textbooks and journals. Instructional materials are the relevant materials a teacher uses during the social studies instructional process to facilitate teaching and learning, making the instructional content more practical and less vague. Therefore, such resources may be both human and non-human, provided they facilitate the acquisition and evaluation of knowledge, skills, attitudes, morals, and values (Ogbaji, 2017).

It is impossible to exaggerate the importance of instructional materials and resources in Social Studies education (Choi and Choi, 2022). They enhance understanding and foster analytical and critical thinking skills essential for developing engaged citizenship. Instructional materials include a wide range of materials such as textbooks, maps, charts, and examples of classical instructional materials. In contrast, interactive programs, digital platforms, and movies are more sophisticated. Teachers of these materials support students in their learning and teaching, facilitating an understanding of the concepts. With the rapid development of Information and Communication Technology (ICT), educators have unprecedented access to resources. Integrating these digital tools into the classroom has significantly improved students' engagement and understanding of Social Studies content (Nwuke and Nwanguma, 2024; Zhao and Li, 2023; Cayabas Jr and Sumegang, 2023; Guthrie and Klauda, 2017; Kyeremeh and Osei-Poku, 2020; Levy and Acar, 2021; DuBe, 2019). However, selecting and effectively using these materials depends heavily on the teacher's cognition. Teacher cognition, encompassing the knowledge, beliefs, attitudes, and decision-making processes, is crucial in shaping their teaching process (Borg, 2015).

In Social Studies, teachers' cognition regarding instructional materials is crucial in determining how and why certain materials are selected and used during teaching and learning. The cognitive understanding of a material's relevance, usability, and pedagogical effectiveness influences the overall quality of instruction. A study conducted by Shulman (2015) has shown that "teachers with a strong cognitive understanding of instructional materials are more likely to create student-centered learning environments where students are encouraged to explore and engage with the content meaningfully. Teacher cognition of selecting and utilizing instructional materials plays a substantial role in fostering student-centered learning environments".

Teaching Social Studies in Ghanaian Senior High Schools requires instructional materials that support student engagement and tangibly convey complex societal concepts (Ogbaji, 2017).

However, despite the availability of instructional resources, Social Studies teachers in Ghana face significant challenges in selecting and utilizing these materials effectively. Many teachers struggle to select resources that align with curriculum goals, meet the diverse needs of students, and reflect cultural relevance. In light of these challenges, it is essential to examine the cognitive processes of Social Studies teachers, specifically their knowledge, beliefs, and decision-making approaches regarding the principles for selecting and utilizing instructional materials. Gaining insight into these cognitive factors is crucial for enhancing Social Studies instruction in Ghana's Senior High Schools. This study aimed to investigate the cognition of senior high school Social Studies teachers regarding the principles for selecting and utilizing instructional materials within the Mfantsiman Municipality. The study sought to answer these research questions – (1) What knowledge do Social Studies teachers in Senior High Schools in Mfantsiman Municipality have about the principles of selecting and using instructional materials? (2) What criteria do Social Studies teachers in the Mfantsiman Municipality use for selecting instructional materials in Senior High Schools?

2 Theoretical framework

The study was grounded in the ASSURE model. This model emphasizes a systematic approach to instructional design, which provides a clear framework for investigating how Social Studies teachers in the Mfantsiman Municipality select and utilize instructional materials. The ASSURE model, developed by Heinich et al. (1989), is a foundational instructional design framework rooted in constructivist educational theories (Bajracharya, 2019; Iskandar and Farida, 2020). This model outlines a systematic approach for integrating instructional materials in various educational contexts, featuring procedural and cyclical characteristics that emphasize adaptability in classrooms where continuous reflection and adjustment are essential. The six steps of the ASSURE model include: Analyse Learner Characteristics, State Objectives.

Select, Modify or Design Materials, Utilize Materials, Require Learner Response, and Summative Evaluation. A key element of the ASSURE model is the analysis of learner characteristics, which is the initial step in instructional design. This analysis comprehensively assesses the target audience, taking into account their skills, prior knowledge, attitudes, age, grade level, and preferred learning styles. By prioritizing this analysis, the model underscores the necessity of tailoring instruction to meet learners' specific needs, aligning with contemporary practices that advocate for differentiated and personalized learning. Morrison et al. (2019) emphasize the importance of understanding learner characteristics in selecting appropriate instructional media and technology, facilitating effective content delivery. Educators risk employing ineffective tools and strategies without this foundational understanding, compromising learning outcomes.

Moreover, formulating clear and precise lesson objectives influences the selection and use of instructional media within the ASSURE model. Well-defined objectives enable teachers to align their media choices with specific learning outcomes, ensuring that the selected resources enhance educational goals rather than

detract from them. Cha and Lee (2020) and Fassbender et al. (2020) emphasize that a deep awareness of students' characteristics aids teachers in making informed decisions regarding the media that best supports learning, exemplifying the model's commitment to fostering relevant and impactful educational experiences. Furthermore, the ASSURE model emphasizes the importance of considering learning conditions, encompassing the availability and functionality of various instructional tools. Effective media selection is contingent upon understanding these conditions, as the resources available can significantly influence both the teaching process and student engagement. For example, if equipment or technology is lacking, teachers may need to adapt their objectives or select alternative instructional media that can be effectively implemented within the existing constraints.

Additionally, assessing learners' proficiency levels is critical for ensuring that the selected instructional media aligns with their capabilities. Objectives that require higher-order thinking or advanced skills necessitate the use of sophisticated media and technology that can challenge students appropriately while providing the necessary support for skill development. Conversely, if objectives are set too high without corresponding media, students may become frustrated and disengaged, undermining the overall effectiveness of the instructional design.

The ASSURE model shown in Figure 1 provided a clear framework for understanding the study's selection and use of instructional materials. Focusing on learner characteristics highlighted how teachers tailored materials to meet diverse student needs, emphasizing differentiated instruction. The model also guided the study in examining how Social Studies teachers in the Mfantsiman Municipality aligned materials with specific learning outcomes, enhancing the overall quality of instruction delivered to students.

2.1 Conceptual framework

The study's conceptual framework, grounded in the ASSURE model, focuses on integrating instructional materials into Social Studies lessons. It describes three key cyclical stages: the selection stage, where appropriate instructional materials are chosen; the utilization stage, where these materials are effectively used during lessons; and the formative evaluation stage, which assesses the effectiveness and appropriateness of the materials. The selection stage aligns with the first three components of the ASSURE model, which emphasize the importance of teachers having a thorough understanding of learners and considering predetermined instructional objectives when selecting instructional materials (Heinich et al., 1989; Bajracharya, 2019; Iskandar and Farida, 2020). Morrison et al. (2019) noted that understanding learner characteristics and considering the lesson's objectives is crucial for selecting suitable instructional materials that facilitate effective content delivery. Without these foundational principles, teachers risk using ineffective instructional materials, undermining effective teaching and learning of Social Studies.

Apart from examining the factors that influence the selection of instructional materials by Social Studies teachers, the researchers also considered how these teachers apply the principles guiding the use of instructional materials in practice. According to the

framework, this is the utilization phase guided by the fourth and fifth components of the ASSURE. The ASSURE model suggests that using instructional material must aid in achieving the instructional objectives through learner engagement, ease of understanding, concept formation, and retention. Heinrich et al. (2002), as cited in Trif-Boia (2022), emphasize that "teachers should consider several essential criteria when using instructional materials. These include ensuring alignment with the curriculum, the accuracy and relevance of content, the clarity and conciseness of language, opportunities to engage and motivate students, and opportunities for student participation".

The final stage of the framework is the formative evaluation stage, which is rooted in the last component of the ASSURE model. This stage emphasizes the critical assessment of instructional materials after use (Trif-Boia, 2022; Iskandar and Farida, 2020). At this point, the criteria proposed by Susilana and Reyina were applied to evaluate the appropriateness of the instructional materials used by Social Studies teachers. These criteria focus on how well the materials align with learner characteristics, the subject matter, and the available resources. Since the evaluation is formative, the insights gathered should inform teachers' decisions in selecting and using instructional materials in future lessons. This formative evaluation reinforces the cyclical structure of the framework. The framework suggests that navigating the three phases of integrating instructional materials requires teachers to have a deep understanding of material selection principles and engage in ongoing reflective practices.

2.2 Principles for selecting instructional materials

Rude (1974) highlights fundamental principles for evaluating and selecting instructional materials. In his seminal work, "Evaluating and Selecting Instructional Materials for Specific Learners," Rude outlines three primary principles: learner characteristics, learning objectives, and material characteristics. These principles emphasize the importance of understanding learners' instructional needs, which include what they need to learn, their starting point, preferred learning methods, and optimal teaching approaches. Again, material characteristics should be assessed to ensure they align with these needs, focusing on what the materials teach, their starting point, the accommodation of different learning styles, and the presentation of information. Furthermore, Rude's principles emphasize the importance of considering the lesson objective when selecting instructional materials for Social Studies lessons. A comprehensive evaluation of objectives and the characteristics of the material will help the Social Studies teacher identify the skills, abilities, and concepts to be taught, reinforced, or utilized, ensuring the materials align with them appropriately.

Again, Heinrich (1982), in their book "Instructional Media and the New Technologies of Instruction," devised a procedural model called the acronym "ASSURE," which was intended to ensure the effective use of instructional materials. The model synchronized with ASSURE includes six steps in systematic planning for media use: analyse Learner Characteristics, State Objectives, Select, Modify or Design Materials, Utilize Materials,
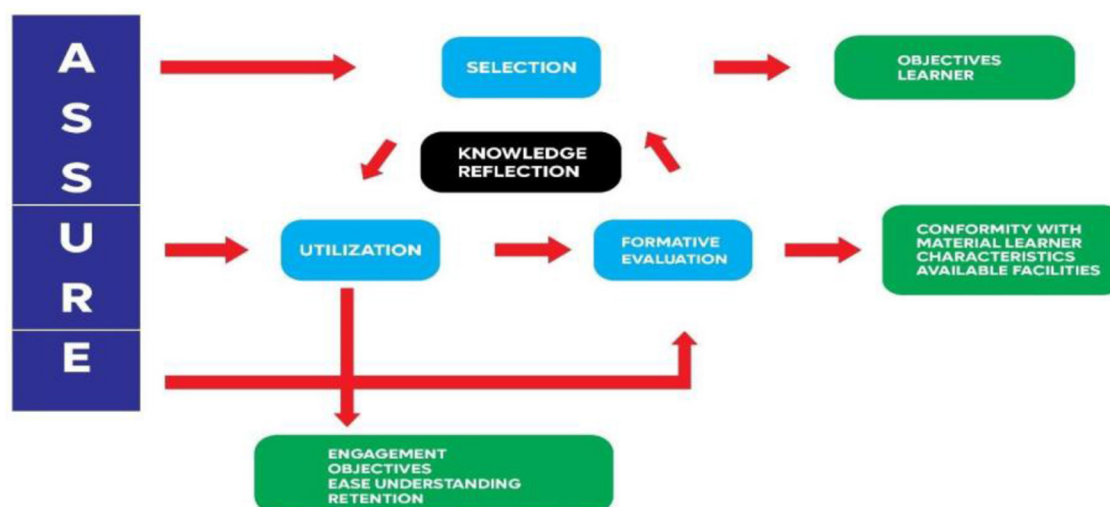
FIGURE 1
ASSURE model framework for effective instructional material selection and utilization (Adapted from Heinich et al. (1989)).

Require Learner Response, and Summative Evaluation. In effect, before selecting instructional material for Social Studies lessons, Heinrich's (1982). The "ASSURE" model suggests that the social studies teacher should evaluate the material against established learner characteristics and instructional objectives". Following Heinrich (1982) and Reiser and Gagne (1983) provided a broader framework in their review of classical models for evaluating and selecting instructional materials. They identified three key factors: physical characteristics of the material, characteristics of the learner, and practical factors. Physical characteristics involve determining if the material should include motion, still images, audio, or audiovisual content. Reiser and Gagné emphasize that "understanding learner characteristics is essential, as materials should be suitable for different types of learners". Finally, they mention practical factors such as cost, availability, and convenience. These considerations ensure that the selected materials are practical and feasible to implement. Addressing these factors in teaching Social Studies implies that social studies teachers can make informed decisions that enhance instructional effectiveness and align with educational objectives.

A critical analysis of this classical literature indicates that while Rude (1974) and Reiser and Gagne (1983) share common ground in emphasizing learner characteristics, learning objectives, and material characteristics, they focus on practical factors and the instructional setting. Reiser and Gagné provide a more comprehensive framework, incorporating practical considerations such as cost, availability, and the instructional environment. In contrast, Rude offers a more detailed analysis of the instructional needs and characteristics of the materials.

Moreover, a study by Thompson (2021), which examined the criteria for selecting instructional materials to enhance students' academic performance in Business Studies, revealed that both class size and teachers' instructional methods are significant factors teachers consider when selecting instructional materials. Thompson's study suggests that when selecting appropriate instructional materials, teachers consider how the materials will suit the class size and the instructional methods.

Gauging from the empirical literature presented, the principles for selecting instructional materials have continued to evolve, with contemporary literature expanding on classical foundations to address modern educational contexts. The early works on evaluating and selecting instructional materials, particularly those from the 1970s and 1980s, laid foundational principles that continue to influence contemporary discourse. It can be concluded from this literature that, in selecting instructional materials for Social Studies lessons, the following principles are crucial: learner needs and characteristics, aligning instructional materials with lesson objectives, consideration of the instructional setting, cost, availability, convenience, class size, and the instructional techniques to be employed.

2.3 Principles for classroom application of instructional materials

Teachers are expected to use instructional materials effectively following a thorough selection process. Ajoke (2017) reviewed the literature on selecting and using instructional materials, establishing that such materials should make learning enjoyable, boost motivation and engagement, facilitate concept formation, enhance information retention, enable practical application, and support holistic learning. Similarly, Bulusan (2024) conducted a systematic review and introduced the "CARE" criteria for presenting instructional materials. According to Bulusan (2024), instructional materials should ensure cultural enrichment, authenticity, relevance, and ease of understanding. This means that the presentation of instructional materials, particularly in Social Studies instructions, should be culturally appropriate and fair (cultural enrichment), accurately reflect real-life situations

(authenticity), contribute meaningfully to the lesson (relevance), and be easy for learners to comprehend (ease of understanding).

Mansur and Utama (2021) evaluated the selection and use of learning media in Junior High Schools in Banjarmasin using the ASSURE model. Their findings indicate that using learning media was adequate and appropriate, as it aligned with lesson objectives, was suitable for learner comprehension, and elicited positive responses from learners. This suggests that when using instructional materials for social studies instruction, the teacher must present the materials in a way that aligns with the instructional objectives and facilitates students' understanding and engagement. Again, a quasi-experimental study conducted by Enikanolaye (2021) examined the effects of multimedia instructional strategies on the performance and retention of senior high school students in mathematics in Ilorin, Kwara State, Nigeria. The study revealed that "teachers' effective presentation and interpretation of instructional materials significantly enhance students' retention, thereby facilitating a deeper understanding of the learning concepts. Using such materials enables teachers to deliver new content in a more memorable and meaningful manner to students". From the literature provided, "the principles of presenting instructional materials encompass several key aspects. Firstly, instructional materials should enhance the learning experience by making it enjoyable and boosting student motivation and engagement (Ajoke, 2017; Amuzu, 2018; Schunk, 2019). They should facilitate concept formation, enabling students to understand and apply new knowledge effectively.

Additionally, these materials must improve information retention by reinforcing key concepts, supporting practical application to bridge theory with practice, and promoting holistic learning by addressing various developmental aspects of students (Ajoke, 2017). Building on these foundational principles, Bulusan (2024) introduced the "CARE" criteria, emphasizing that instructional materials should be culturally enriching, authentically represent real-life situations, be relevant to lesson objectives, and be easy for learners to understand. Furthermore, Mansur and Utama (2021) highlighted that materials should align with lesson objectives, be suitable for learner comprehension, and elicit positive student responses, as observed in their summative evaluation. These principles collectively ensure that instructional materials effectively support and enhance learning.

3 Materials and methods

3.1 Research approach and design

The study employed a multiple-case study design to investigate how Senior High School Social Studies teachers comprehend and implement the principles of selecting and using instructional materials in their lessons. Specifically, a literal replication approach was employed, which is expected to yield similar findings across the various cases examined. As noted by Priya (2021), a multiple-case design is particularly beneficial when researchers aim to determine if the findings from an initial case can be observed in subsequent cases, thereby facilitating the generalization of these findings. This design was considered appropriate for the current study because the researchers sought to thoroughly explore the knowledge and practices of Social Studies teachers across different school settings.

The study was structured using the literal replication approach, allowing the cases to corroborate each other. Each case was intended to either confirm or challenge the conclusions drawn from the others (Gustafsson, 2017; Hancock et al., 2021). This method enhances the reliability of the findings and provides a more comprehensive understanding of how instructional materials are integrated into teaching practices.

3.2 Participants

The research engaged eight Social Studies teachers from three Senior High Schools in the Mfantseman Municipality. This group consisted of in-field teachers with specialized training in Social Studies and out-of-field teachers with general teaching qualifications but lacked specific training in the subject. By incorporating both types of teachers, the researchers sought to investigate how their knowledge and application of instructional material selection principles differ. The sampling process commenced with the selection of three senior high schools in the Mfantseman Municipality, employing the convenience sampling technique. Convenience sampling, as defined by Golzar et al. (2022), is a method in which units are selected for inclusion in the sample based on their accessibility to the researcher, considering factors such as geographical proximity, availability at a specific time, and willingness to participate in the research. The schools were selected due to their proximity, including three senior high schools: one Grade A, one Grade B, and one Grade C school. Students are placed in these categories of schools based on their performance from junior high school to senior high school. Grades enable teachers to distinguish between varying levels of academic achievement. Grade A typically represents excellent performance, Grade B signifies good performance, and Grade C denotes satisfactory performance. The study selected Social Studies teachers in these grade schools based on their utilization of instructional materials to achieve academic achievement in students. The convenience sampling method was applied again to select teachers, emphasizing their willingness to participate in the study. A total of eight social studies teachers participated in the study.

The interviews aimed to assess the teachers' knowledge of selecting and using instructional materials, as well as how they apply these principles in their daily teaching practices. Thirteen (13) open-ended, semi-structured interview guides were used to solicit responses from the participants. Research question one comprised six questions, and research question two contained seven. 1 h was spent on each teacher during the interview sessions. Interviews were recorded and transcribed in line with the research questions.

3.3 Data analysis

The data was analyzed using both thematic approaches, following the six-step process outlined by Naeem et al. (2023). The process commenced with the transcription of the interview data, followed by familiarization with the transcripts to select relevant quotations. Subsequently, keywords were identified within the

data, and segments related to specific themes were systematically coded. Developing overarching themes based on the coded data constituted the fourth step. The keywords, codes, and themes were interpreted in the fifth step to derive deeper insights. Finally, a conceptual model was developed to organize the findings into a coherent framework. This structured method ensured a comprehensive and organized qualitative data analysis, effectively addressing the research objectives.

4 Findings

Using the ASSURE model's elements as thematic guides provided a structured guideline for discussing the findings. The ASSURE model offers a comprehensive framework for instructional design and delivery, and its six components—Analyse Learners, State Objectives, Select Methods, Media, and Materials, Utilize Media and Materials, Require Learner Participation and Evaluate and Revise—were used to evaluate how effectively these teachers employ the principles of selecting and using instructional materials.

4.1 Teachers' knowledge of principles for selecting and using instructional materials

This section addresses the first research objective, which sought to assess Social Studies teachers' knowledge of the principles of instructional materials. Through in-depth interviews, several insights were revealed to answer the research question: *"What knowledge do Social Studies teachers have in Senior High Schools in Mfantsiman?"* What does the municipality have to say about *instructional materials*? "The findings of this research question are organized under five themes and five sub-themes, as shown in the Table 1 below.

4.1.1 Instructional material use in social studies

The data gathered from the interviews revealed that the respondents demonstrated a satisfactory understanding of incorporating instructional materials into Social Studies lessons. Their responses emphasized key aspects of instructional material use, including its significance in engaging learners, maintaining interest, facilitating comprehension, and ensuring the relevance of the subject matter. The teachers cited in the study are pseudonyms, not their real names.

TABLE 1   Thematic summary of findings for research question 1.

Themes	Sub-themes
1. Instruction material use in social studies 2. Source of teachers' knowledge 3. Learner knowledge as a principle 4. Instructional objectives as a principle	• Awareness of students' characteristics and learning needs • Consideration of students' interest and engagement • Sensitivity to cultural background • Relevance of the alignment • Implications of a mismatch • Subject Matter as a Principle

Dela, a teacher at a Category B school with in-field training, remarked that:

> "Based on my acquired knowledge, I believe using instructional materials is one of the most effective methods for engaging students and sparking their interest. This approach helps students gain a clear understanding of the subject matter".

Similarly, Ashante, a Category A school teacher with out-of-field training, supported this finding by stating that:

> "When selecting teaching and learning materials, they should be directly relevant to the topic. It is essential not to choose materials randomly but to select resources that align with the specific topic to ensure they are suitable.

Again, Ibrahim, a Category C school teacher with in-field training, mentioned that:

> "As a Social Studies teacher, I know that selecting and using instructional materials enhances students' understanding, as nearly all topics can be supported by teaching aids. Some concepts that require repeated explanations become more transparent with these materials.

In addition to acknowledging the importance of integrating these materials, several participants also demonstrated an awareness of the challenges. In this regard, Ofori, a Category A school teacher with in-field training, expressed that:

> "Social Studies primarily addresses social issues, and selecting appropriate instructional materials can be challenging. Obtaining tangible resources often requires taking students to specific sites, which is difficult within our current educational setup. Sourcing certain materials for Social Studies lessons can sometimes be quite demanding".

Seth, a Category B school teacher with out-of-field training, also stated that:

> "I think I have sufficient knowledge of selecting and using instructional materials; however, applying this knowledge remains challenging. The cost, an often unsuitable classroom environment for certain materials, and other issues make applying it difficult".

Moreover, the respondents' statements collectively confirm that, regardless of their demographic backgrounds, they all have a fair understanding of how strategically using appropriate instructional materials can contribute to effective social learning, including studies instruction and the challenges involved.

4.1.2 Sources of teachers' knowledge of using instructional materials in social studies

The interviews revealed several key sources through which the respondents developed and refined their knowledge of integrating instructional materials and resources in Social Studies instruction. Some respondents identified teacher education and

training, professional experience, and in-service training as the primary avenues through which they acquired this knowledge. The statements below captured this finding.

> "It is based on the experiences I have gathered over the years in teaching" (Ashante, out-of-field, Category A).
> "Well, I learned some of them in school while others were through my experience in the service" (Ibrahim, in-field, Category C).
> "I developed my knowledge through a postgraduate diploma programme I offered. Again, we have had workshops through PLC. As far as we are concerned, the service provides organized workshops, mostly" (Seth, out-of-field, Category B).

4.1.3 Learner knowledge as a principle

The data gathered indicated that Social Studies teachers across all selected schools possess substantial knowledge of the need to consider learners as a crucial factor in selecting and using instructional materials. The analysis of their responses uncovered key themes related to this principle, including awareness of student characteristics, attention to student interests, and sensitivity to cultural backgrounds.

4.1.3.4 Awareness of student characteristics and learning needs

The findings revealed that "the Social Studies teachers involved in this study demonstrated a significant awareness of the importance of aligning instructional materials with their students' specific characteristics and learning needs". Some respondents emphasized the need to adjust materials according to the level of teaching and the unique types of students in their class, implying that instructional materials must match students' cognitive abilities and developmental stages. Other respondents who acknowledged the importance of recognizing individual learning differences, explicitly noting the varied learning paces of students, further supported this understanding. This awareness reflects teachers' knowledge that instructional materials should be adaptable to each student's unique traits and learning needs, a foundational component of effective instructional practices.

To justify these findings, Dela, a teacher from a Category B school, mentioned that:

> "Yes, every teacher must be aware of the level at which they are teaching and the specific type of students they are dealing with. To select a proper material, these factors must be considered".

Ashante, a teacher from a Category A school, who remarked, further reinforced Dela's viewpoint:

> "When selecting instructional materials, it is essential first to recognize the individual differences among students, including their varying learning paces. We must carefully consider some of these issues during the planning process to ensure that the materials meet the diverse needs of all students.

In addition to these responses, Korsah, from a Category A school, added that:

> "When choosing the material, teachers must consider and ensure that the teaching and learning materials will cover all the students based on their different backgrounds and learning abilities. Because some are slow learners and some are fast learners".

4.1.3.5 Consideration of student interests and engagement

Another key finding was the teachers' emphasis on aligning instructional materials with student interests to promote engagement. A response by Ofori, a respondent from a category A school, revealed instances where learners' interests guided the choice of materials, with the teacher providing an opportunity to get involved in the selection process, observing that students preferred interactive materials, such as videos and online resources, over traditional still pictures and board illustration. Ofori's response illustrates an understanding that "instructional materials should be relatable and engaging, aligning with a student-centered approach in Social Studies teaching." This engagement strategy reflects the teachers' recognition that student interest is crucial in effectively utilizing instructional materials. Below is what Ofori reported:

> "Yes, when students' interests are considered during the teaching and learning process, the teacher can better identify when certain materials fail to engage them. For example, sketches and board illustrations may not be as captivating because students are accustomed to these materials. In my approach, I often involve students in selecting lesson materials. I ask for their input on what they would like to use, and they often suggest videos or online resources for further exploration. Recently, while teaching the topic of resource development and utilization, the students were inquisitive about the distribution of resources in Ghana. To support their interest, I provided a link to a documentary on the topic, which they thoroughly enjoyed".

4.1.3.6 Sensitivity to cultural backgrounds

The teachers are also knowledgeable of cultural considerations when selecting instructional materials. For instance, Ibrahim, a category C school teacher, emphasized the importance of selecting resources that respect students' cultural backgrounds, noting that certain materials may conflict with the cultural values of some students or be unfamiliar to them.

Ibrahim expressed that:

> "To the best of my knowledge, the selection of teaching and learning materials by myself and other teachers is influenced by students' cultural backgrounds. Some materials may be culturally sensitive or conflict with the values of particular students, while others may be unfamiliar to them.

The statement above illustrates Ibrahim's awareness that instructional materials should be culturally sensitive, ensuring that the content is respectful and relevant to students' diverse cultural backgrounds.

4.1.4 Instructional objectives as a principle

This study found that the Social Studies teachers involved know why instructional materials selected for Social Studies lessons must align with the learning objectives. Sub-themes from the data include the necessity of alignment with learning objectives and the impact of alignment on lesson effectiveness.

4.1.4.1 Relevance of the alignment

From the interviews, the teachers emphasized that alignment between instructional materials and learning objectives directly facilitates students' understanding and enhances the overall effectiveness of the lesson. Ashante reported that aligning materials with objectives is crucial for enhancing student comprehension and facilitating the achievement of the lesson's goals. In this regard, Ashante stated that:

> "Indeed, the learning objectives are crucial for enhancing student understanding. To facilitate this, it is necessary to consider them carefully in order to achieve the intended outcomes of the lesson".

Korsah further supported this, noting that materials must be directly related to the objectives to make the lesson meaningful and aid in student understanding, mainly since the lesson builds upon students' previous knowledge. According to Korsah:

> "The selected materials should have a direct relationship with the objectives because, at the end of the lesson, the teacher must assess the students. Again, since lessons are built on their previous knowledge, the materials should relate to the objectives for easy understanding".

4.1.4.2 Implications of a mismatch

Furthermore, a key finding from the responses is that the respondents recognized that when instructional materials do not align with the learning objectives, the effectiveness of the lesson is undermined. Multiple respondents, through their responses, emphasized how a mismatch between the objectives and the materials would hinder the lesson's effectiveness and may lead to unintended learning outcomes. For instance, Dela noted that:

> "The learning objectives must be aligned with the instructional materials. If there is a mismatch between the objectives and the materials, the lesson will only proceed based on what can be taught rather than what is intended to be taught.

Similarly, Dorothy, a teacher from a category C school, argued that:

> "The instructional materials must align with the learning objectives. If they do not, continuing the course becomes challenging. Therefore, both should complement each other". According to Ibrahim,
> "It should align. If they do not align, you might teach them something different or get them to think about something different. If they do not align, it will not have the lesson's full impact".

4.1.4.3 Subject matter as a principle

The analysis of the responses regarding Social Studies teachers' knowledge about the importance of subject matter alignment in selecting and utilizing instructional materials revealed that the teachers possess in-depth knowledge and a clear understanding of how subject matter influences the choice of instructional materials. The respondents repeatedly emphasized the necessity of selecting instructional materials compatible with the subject matter to support the effective delivery of Social Studies content. They noted that when the subject matter is not correctly aligned with the lesson and instructional materials, it becomes challenging to deliver the content effectively. In addition, the appropriate alignment simplifies the teaching process, allowing the materials to explain key concepts, thereby reducing the teacher's need to elaborate verbally. To exhibit this insight, they expressed:

> "They all have to align. You look at the topic, then the content, everything. It should align. Every activity determines the instructional materials; however, selecting the appropriate materials that align with the subject matter helps the teacher and students learn. This will help you, as a teacher, to achieve your lesson objective with ease, as the selected instructional materials will help explain the concept to you. So, the subject matter. If they differ, it will not help" (Ibrahim, in-field, Category C).

To buttress this claim, Ofori, a teacher from a category A school, expressed that:

> "It is important to consider the broad perspective of the topic, as this will ensure that the materials or resources accurately reflect the realities of society. Given that Social Studies encompasses all aspects of social life, it is essential for teaching and learning materials (TLMs) to effectively support teachers in delivering Social Studies content.

Similarly, Dela, a teacher from a Category B school, shared that:

> "The subject matter being taught must be properly aligned with the lesson and instructional materials; without this alignment, it becomes difficult to deliver the content effectively".

4.2 Teachers' criteria for selecting instructional materials

This report addresses the second research question: *What criteria do Social Studies teachers in the Mfantsiman Municipality use for selecting instructional materials in Senior High Schools?* The findings related to this question are organized into three main themes and six sub-themes. These are presented in the Table 2 below.

4.2.1 Instructional materials used by teachers

Before ascertaining the specific factors the respondents consider before selecting an instructional material, the researchers first explored the common instructional materials

TABLE 2 Thematic summary of findings for research question 2.

Themes	Sub-themes
1. Instructional materials used by the teacher 2. Factors influencing the choice of instructional materials 3. Visual aids and multimedia 4. Principles of instructional material selection	• Textbooks and printed materials • Alignment with curriculum/lesson objectives • Inclusivity and cultural sensitivity • Consideration of resource availability • Adaptation to class size

often used in the teaching and learning of Social Studies. The responses indicated that the teachers rely on various instructional materials to enhance their Social Studies lessons. They prefer materials that make learning practical and engaging for students. The materials mentioned by the respondents included.

4.2.1.1 Textbooks and printed materials

It was identified that textbooks and printed materials are the most commonly used instructional materials among all the Social Studies teachers involved in the study. The respondent affirmed that the accessibility and structured format of textbooks make them convenient and help them consistently cover essential topics. As Dela noted:

> "The resources available include a textbook, which I use regularly in my teaching, and some past exam questions that I also incorporate into my lessons".

Korsah shared a similar preference, stating that:

> "The most common resource I use is the printed textbook. It is the most accessible and easiest option for my teaching".

4.2.1.2 Visual aids and multimedia

The results also revealed that some teachers preferred using visual aids, such as still pictures and illustrations, along with multimedia materials like documentaries and short videos. These tools were chosen to enhance the learning experience by making the content more engaging and easier to understand. The following responses captured this finding.

> "Most of the time, I use pictures. Additionally, if necessary, I incorporate short documentaries or videos where I shoot and present the content. Afterwards, I discuss the material with the students, allowing them to observe how the concepts are demonstrated or performed" (Dorothy, category C).

Ibrahim also echoed this, mentioning that:

> "In lessons about puberty, I use pictures. Overall, I typically rely on pictures, occasionally use videos from my phone, and incorporate real objects when needed".

On the same issue, another participant expressed that:

> "When deciding on what to use, I prefer videos because, as the saying goes, "a picture cannot lie." Seeing the real thing makes the lesson more practical and relatable" Lastly, Ofori also confirmed this finding by stating that:

> "I typically incorporate ICT-based materials and board illustrations in my teaching methods."

4.2.2 Factors influencing the choice of these materials

Probing further to explore the factors influencing teachers' selection of instructional materials. The study identified several key factors, including the relevance of the materials to exam preparation, cultural and contextual appropriateness, practicality, availability, and the capacity to engage students. Most respondents claimed to prioritize materials that enhance students' understanding and retention of content while ensuring the learning experience is enjoyable and effective.

Dela, who mentioned commonly using printed textbooks and past question papers, claimed that:

> "As I teach, I guide them through solving past exam questions, which helps them understand the format and approach. This way, when they face the WASSCE, they will be better prepared and more confident in handling the questions".

Ibrahim, who also stated the frequent use of pictures and video, cited that:

> "Well, their availability. Most of these instructional materials are easily available. You do not need to hassle to get them. For example, it is easily accessible to get some of these videos and pictures online".

Ibrahim further states that:

> "If they are available and it will not help them to understand you, you cannot use it. So, I consider these two".

Korsah supported this by expressing that:

> (Seth). "I consider the availability of the materials and how they can arouse the learners' interest. I consider the learners' interest since they are beneficial to the material. It should arouse their interest so that they will engage in the teaching and learning".

4.2.3 Principles of instructional material selection

Moreover, the data on how Social Studies teachers select instructional materials in selected Senior High Schools within the Mfantsiman Municipality revealed a structured and contextually sensitive approach incorporating many key principles of instructional material selection. Through the thematic analysis, four central themes emerged: alignment with lesson objectives, consideration of resource availability, adaptation to class size, and inclusivity.

4.2.3.1 Alignment with curriculum/lesson objectives

The study revealed that a key factor guiding the respondents in selecting instructional materials is the alignment with curriculum goals and specific lesson objectives. The respondents consistently noted that when selecting instructional materials, they consulted the Social Studies syllabus and other curriculum documents to ensure that selected materials corresponded with the educational standards and competencies required by the curriculum. These findings are reflected in the responses.

> "I begin with reviewing the syllabus to identify the topic. After confirming the topic, I consult the textbook to gather relevant content, then select suitable materials and proceed with the lesson" (Dela, Category B).
>
> "I do not select materials randomly. I first develop my objectives and outline the content. As mentioned, I ensure that the instructional materials align with the lesson I plan to teach. I also consider the students' level to determine if the materials fit their needs" (Dorothy, Category C).
>
> "I begin by assessing the topic to determine its relevance to the students and identify what they are expected to know and do" (Ofori, Category A).

4.2.3.2 Inclusivity and cultural sensitivity

Another crucial principle the respondents emphasized as part of the selection process is the cultural sensitivity and inclusivity of instructional materials. Several of the teachers reported that they select materials that are culturally relevant and inclusive of students' diverse backgrounds.

As noted by Dorothy, a respondent from category A:

> "I consider learners' background when selecting teaching and learning materials (TLMs). For example, since I teach in the Fante area, I strive to incorporate materials that represent other ethnic groups in my class. I typically choose materials that relate to students' experiences and encourage them to reflect on how the material connects to their school environment and their potential value".

Korsah, a respondent from a Category C school, also expressed that:

> "I ensure that instructional materials reflect the diversity in the classroom, as both the students and I come from different societal backgrounds, beliefs, and perspectives. I prioritize selecting materials that respect and consider everyone's beliefs, religions, viewpoints, and ways of understanding".

Additionally, Ofori from category A added, "I involve the students in selecting instructional materials for my lessons." *They often make suggestions, which I assess. I encourage them to discuss the topic to be studied before we cover it in class. If I find the suggested materials suitable, I ensure that they are incorporated into the lesson.*"

4.2.3.3 Consideration of resource availability

The study found that resource availability is a significant factor influencing teachers' selection of instructional materials. Findings indicate that limited school resources often compel teachers to adapt their instructional practices pragmatically. Several respondents noted that classrooms lacking reliable electricity restrict the use of digital tools, such as projectors, leading them to rely on physical materials like charts and printouts, which are more accessible and suited to these constraints.

Ashate from a category A school explained that:

> "Many classrooms lack electricity, so most teachers do not use projectors. I am one of the few who use them, as I have my desktop projector and Bluetooth speaker. However, due to the lack of electricity, many teachers rely on simple materials, such as drawings, which limits the variety of available resources."

Ibrahim from a category C school contributed by stating that:

> "For example, if I have downloaded a video and need to show it to a larger class, displaying it on a phone would not be appropriate unless a projector is available. Since projectors are unavailable in our school, using videos for large classes is not feasible, especially when time is limited".
>
> Seth, a respondent from category B, also confirmed this finding by stating:
>
> "The primary factor I consider is the availability of resources. I have never taken a projector to class because we do not have one, and I don't have the funds to purchase one. It would be ideal if projectors and other resources were accessible, as it would expand my options for instructional materials. However, due to the lack of such facilities, my selection is limited to what is already available".

4.2.3.4 Adaptation to class size

The study further revealed that class size is a significant factor influencing the selection of instructional materials. Teachers confirmed that they carefully consider class size when choosing materials that enhance accessibility and foster student engagement, even in less-than-ideal classroom conditions. Several responses, including that of Ibrahim and Ashante, clearly captured the findings presented. Expressly, Ashante, a respondent from a category A school, affirmed this by stating that:

> "Given the large class size, if the material cannot be played or projected, I ensure it is large enough for all students to see clearly".
>
> Ibrahim, another respondent from a category C school, reiterated that:
>
> "I also consider the size of the class. In some classes, the number of students is small. However, if I have downloaded a video for a larger class, it would not be appropriate to show it on a phone unless a projector is available.

5 Discussion and conclusion

5.1 Teachers' knowledge of principles for selecting and using instructional materials

The first research question focused on - *what knowledge Social Studies teachers in Senior High Schools in Mfantsiman Municipality have about the principles of selecting and using instructional materials*. The study findings suggest that teachers have a deep understanding of their students' cognitive levels, cultural backgrounds, and individual learning preferences. They intentionally choose culturally sensitive and cognitively appropriate materials, reflecting a commitment to inclusivity". Teachers also adjust their instructional resources to accommodate the different learning paces within the classroom, ensuring that materials are accessible to both fast and slow learners. This awareness is crucial in creating an inclusive environment that respects diverse cultural values and individual learning needs. These findings align with Mansur and Utama (2021) research, which highlighted that teachers' instructional practices often incorporate supportive materials that align closely with lesson objectives to enhance engagement and understanding. The implications of this alignment are significant: by selecting materials that cater to diverse learning styles and cultural backgrounds, teachers are better equipped to create an equitable learning environment.

This approach supports differentiated learning and reinforces culturally relevant pedagogy, enhancing students' engagement and academic performance. Cha and Lee (2020) state that a deeper understanding of students' characteristics enables teachers to make informed decisions about the media that best support learning, exemplifying their commitment to fostering relevant and impactful educational experiences. However, for this inclusivity to be fully effective, teachers must have access to a broader range of culturally diverse resources and materials.

5.2 Teachers' criteria for selecting instructional materials

The second research question was*: what criteria do Social Studies teachers in the Mfantsiman Municipality use when selecting instructional materials in senior high schools*? The findings reveal that teachers recognize the importance of setting clear criteria when selecting resources that directly support learning objectives. Teachers consistently report aligning instructional materials with specific lesson objectives to ensure these resources actively contribute to the intended learning outcomes. For example, they choose materials closely tied to Social Studies concepts, enhancing students' comprehension and engagement with the content. Teachers also understand that a misalignment between objectives and materials could lead to confusion or unintended learning outcomes, underscoring their commitment to purposeful instructional planning. This alignment highlights teachers' dedication to achieving specific educational goals and underscores the critical role of well-defined objectives in selecting instructional materials.

Supporting this, Iskandar and Farida (2020) argue that clearly defined objectives enable teachers to choose media that aligns with specific outcomes, ensuring that the materials enhance rather than detract from the learning process. According to Morrison et al. (2019), aligning instructional objectives is essential for selecting effective materials that facilitate successful content delivery. The findings suggest that "teachers may use materials that do not support effective teaching or learning without clear objectives. This misalignment can weaken students' grasp of Social Studies concepts, reduce engagement, and ultimately hinder academic progress. Consequently, setting specific, measurable objectives is foundational for effective instructional planning, ensuring that each chosen resource intentionally meets educational".

The study concluded that the teachers' awareness of instructional material principles reflects their ability to align these materials with student needs and instructional objectives, indicating a strong foundational knowledge base for effective teaching and learning of Social Studies. However, while they may be mindful of cultural and learner diversity in selecting instructional materials, systemic constraints often hinder the full utilization of this knowledge to foster more inclusive and interactive learning environments. The study also concluded that the teachers' material selection aligns well with curriculum objectives and student needs. However, this process often depends on subjective judgment rather than standardized evaluative tools, which could lead to inconsistencies in instructional quality. The study suggests that Professional Learning Community (PLC) meetings should strengthen teachers' understanding of selecting and using instructional materials effectively, emphasizing their practical application in diverse classroom settings. The study also suggests that Social Studies teachers should develop guidelines and checklists to standardize the selection of instructional materials, incorporating inclusivity, cultural sensitivity, subject matter, and resource availability as key criteria.

6 Limitations of the study

The study's qualitative nature may limit the generalisability of its findings to different regions or contexts beyond Mfantsiman Municipality. The small sample size of eight teachers may not fully represent the diverse perspectives and practices of all Social Studies teachers in this context. The study does not consider external factors influencing instructional material selection, such as administrative policies or available resources.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving humans were approved by University of Education, Winneba, Ethical Review Board (UEWERB). The

studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study. Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

Author contributions

AB: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

Funding

The author(s) declare that no financial support was received for the research and/or publication of this article.

Conflict of interest

The author declares that the research was conducted without commercial or financial relationships that could create a conflict of interest.

Generative AI statement

The author(s) declare that no Gen AI was used in the creation of this manuscript.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

References

Ajoke, A. R. (2017). The importance of instructional materials in teaching English as a second language. *Int. J. Hum. Soc. Sci. Invent.* 6, 36–44.

Amuzu, S. (2018). Bridging the gap between theory and practice; teachers' utilization of instructional resources in teaching social studies in basic schools in West Mamprusi District in Northern Region, Ghana. *Int. J. Educ. Learn. Dev.* 6, 10–25.

Bajracharya, J. R. (2019). Instructional design and models: ASSURE and Kemp. *J. Educ. Res.* 9, 1–9. doi: 10.3126/jer.v9i2.30459

Borg, S. (2015). "Researching language teacher education," in *The Continuum Companion to Research Methods in Applied Linguistics, 2nd Edn* (New York, NY: Continuum Companions), 541–560.

Bulusan, F. (2024). An emerging instructional materials design model for English as a second language (ESL) and English as a foreign language (EFL) senior high school contexts. *Innovation Lang. Learn. Teach.* 1–14. doi: 10.1080/17501229.2024.2431890

Cayabas Jr, J. P., and Sumeg-ang, D. A. (2023). Challenges and interventions in developing instructional materials: perspectives of public school teachers in basic education. *Int. J. Innovative Res. Sci. Stud.* 6, 849–855. doi: 10.53894/ijirss.v6i4.2059

Cha, H. J., and Lee, G. S. (2020). Analyzing in-service primary and secondary teacher's experience on instructional media development with scratch: based on the ASSURE model. *J. Korean Assoc. Inf. Educ.* 24, 265–278. doi: 10.14352/jkaie.2020.24.4.265

Choi, H., and Choi, Y. (2022). Promoting critical thinking in social studies: the role of interactive digital tools. *J. Soc. Stud. Educ.* 29, 101–118.

DuBe, P. (2019). Utilization of instructional media in teaching and learning by secondary school teachers. a case of MKOBA 1 high school. *Int. J. Innovative Sci. Res. Technol.* 4, 409–418.

Enikanolaye, A. J. (2021). Effects of a multimedia instructional strategy on senior school students' performance and retention in mathematics. *Anatolian J. Educ.* 6, 193–206. doi: 10.29333/aje.2021.6214a

Fassbender, S., Koerner, A., and Müller, M. (2020). The impact of real-world problems on student engagement in the Social Studies classroom. *Educational Research Review*, 33, 94-106.

Golzar, J., Noor, S., and Tajik, O. (2022). Convenience sampling. *Int. J. Educ. Lang. Stud.* 1, 72–77.

Gustafsson, J. (2017). *Single Case Studies vs. Multiple case studies: A Comparative Study*. Halmstad: Halmstad University.

Guthrie, J. T., and Klauda, S. L. (2017). Engagement in reading: motivation and strategies for fostering engagement in the classroom. *Educ. Psychol.* 47, 563–578.

Hancock, D. R., Algozzine, B., and Lim, J. H. (2021). *Doing Case Study Research: A Practical Guide for Beginning Researchers*. New York, NY: Teachers College Press.

Heinich, R., Molenda, M., and Russell, J. D. (1989). *Instructional Media and the New Technologies of Instruction, 3rd Edn*. New York, NY: Macmillan.

Heinrich, L. (1982). A method for the derivation of limit theorems for sums of m-dependent random variables. *Z. Wahrsch. Verw. Gebiete* 60, 501–515.

Iskandar, R., and Farida, F. (2020). Implementasi model ASSURE untuk mengembangkan desainpembelajaran di sekolah dasar. *Jurnal Basicedu*, 4, 1052–1065. doi: 10.31004/basicedu.v4i4.468

Iskandar, R., and Farida, F. (2020). Implementasi model ASSURE untuk mengembangkan desain pembelajaran di sekolah dasar. *J. Basicedu* 4, 1052–1065.

Kyeremeh, F., and Osei-Poku, P. (2020). The use of teaching and learning materials by student teachers at st. ambrose college of education, dormaa akwamu in the bono region of Ghana. *Br. J. Educ. Learn. Dev. Psychol.* 3, 19–35.

Levy, R., and Acar, O. (2021). Student-centered teaching practices in social studies education. *Int. J. Educ. Res.* 105, 147–161.

Mansur, H., and Utama, A. H. (2021). Evaluation of appropriate learning media selection at junior high school. *Indones. J. Instr. Media Model.* 3, 17–25. doi: 10.32585/ijimm.v3i1.1401

Mansur, H., and Utama, A. H. (2021). Evaluation of appropriate learning media selection at junior high school. *Indones. J. Instr. Media Model* 3, 17–25. doi: 10.32585/ijimm.v3i1.1401

Morrison, G. R., Ross, S. J., Morrison, J. R., and Kalman, H. K. (2019). *Designing effective instruction*. John Wiley Sons.

Naeem, M., Ozuem, W., Howell, K., and Ranfagni, S. (2023). A step-by-step process of thematic analysis to develop a conceptual model in qualitative research. *Int. J. Qual. Methods* 22, 16094069231205789. doi: 10.1177/16094069231205789

Nwuke, T. J., and Nwanguma, T. K. (2024). Provision and utilization of physical resources for effective teaching and learning effectiveness in public universities in rivers state. *Int. J. Appl.Sci. Res.* 2, 227–244. doi: 10.59890/ijasr.v2i2.1412

Ogbaji, D. I. (2017). Teachers' perceptions of using instructional materials in teaching social studies in junior secondary schools in calabar municipality, Cross River State, Nigeria. *Glob. J. Educ. Res.* 16, 95–100. doi: 10.4314/gjedr.v16i2.3

Priya, A. (2021). Case study methodology of qualitative research: key attributes and navigating the conundrums in its application. *Soc. Bull.* 70:94110. doi: 10.1177/0038022920970318

Reiser, R. A., and Gagne, R. M. (1983). *Selecting Media for Instruction*. Englewood Cliffs, NJ: Educational Technology Publications.

Rude, R. T. (1974). Objective-based reading systems: an evaluation. *Read. Teach.* 28, 169–175.

Schunk, D. H. (2019). Motivation and learning in social studies education. *J. Educ. Psychol.* 111, 89–101.

Shulman, A. (2015). WE-AB-213-01: AAPM projects and collaborations in Africa. *Med. Phys.* 42, 3648–3648. doi: 10.1118/1.4925832

Tafonao, T., and Purba, B. M. M. (2021). Teachers and technology: christian education teacher strategies in implementing online-based learning in pandemic times. *Indones. J. Instr. Media Model* 3, 66–74. doi: 10.32585/ijimm.v3i2.996

Thompson, G. M. (2021). Influence of criterion for selecting instructional materials on students' academic performance in Ghana. *Int. J. Curr. Innov. Educ.* 5, 36–47.

Trif-Boia, A. E. (2022). Instructional design in education. *Int. E-J. Adv. Educ.* 219–224. doi: 10.47696/adved.202201

Zhao, J., and Li, Y. (2023). Gamification in social studies classrooms: enhancing student engagement through interactive technologies. *Educ. Technol. Res. Dev.* 71, 629–645.