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CURRENT PRACTICES, CHALLENGES, AND TRENDS IN INTEGRATED CURRICULUM ASSESSMENT IN PRIMARY EDUCATION: A SYSTEMATIC LITERATURE REVIEW

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Abstract:

In educational context, the adoption of integrated curricula aims to help students make connections between concepts across academic subjects and real-world applications. However, given the nature of integrated curricula that combine multiple disciplines, assessing student learning within this framework is challenging. Therefore, using the systematic review process outlined by the PRISMA guidelines, this review identifies 9 eligible articles that meet the criteria from 283 published between 2013 and 2025. This review found that some assessment methods are traditional and standardized, while others are more flexible and focus on real-world projects that allow students to apply their knowledge and skills outside of the classroom. There appears to be a clear trend toward combining rigid, structured assessment processes with flexible, real world-based processes that utilize technology to improve the entire range of learning outcomes more effectively. Tools commonly used for assessment include formal assessment frameworks and classroom instruments that assess skills such as critical thinking and collaboration. The findings of this systematic review also provide evidence in the assessment of integrated

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curriculum learning outcomes, such as misalignment between the objectives of integrated curricula and existing examination-oriented assessment systems, a lack of validated assessment frameworks, difficulties in measuring multidimensional learning outcomes, and inadequate teacher preparedness for interdisciplinary assessment. All of these challenges demonstrate a significant gap between theoretical advancements in integrated learning and the practical implementation of assessment strategies in educational settings. Therefore, to develop more effective assessments for integrated curricula in primary education, it is necessary to align the curriculum, teaching practices, and assessments. These efforts are better supported by robust frameworks, improved teacher training, and effective policy integration to ensure accurate evaluation of students' competencies.

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Assessment, Educational Assessment Challenges, Integrated Curriculum, Interdisciplinary Assessment, Primary Education



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Introduction

Challenges in Integrated Curriculum Assessment

Integrated curriculum reforms have gained increasing global traction as education systems are looking to evolve beyond fragmented, subject-based instruction toward a more integrated, interdisciplinary learning. In the context of primary education, such approaches aim to foster conceptual connections across disciplines, promote authentic problem-solving, and cultivate 21st-century skills such as collaboration, creativity, and also critical thinking (Loh et al., 2019) that are considered as relevant to real-world contexts. These skills help an individual to adapt to the current needs of the world. Despite these advancements, assessment practices have not evolved at the same pace. Assessment systems in many contexts continue to be mostly discipline-specific, standardised, and content-driven. Thus, the assessment system limits the ability to capture interdisciplinary understanding, transfer of learning, or the development of higher-order competencies that integrated curricula are designed to promote. The assessment system's discrepancies between curriculum intent and assessment design results in the inability to effectively measure the students' interdisciplinary abilities for the transfer of learning or development of their higher-level cognitive abilities which integrated curricula aim to develop. What was taught in class did not align with what was tested to the students. Integrated learning necessitates diverse forms of evidence, yet assessment instruments often prioritize individual proficiency within specific subjects. While the desired outcome would be that the students learn in a way that connects different subjects, the tests often focus on how well they do in just one subject area. This can make it hard for educators to really understand what students know and can do.

Educational descriptors are a tool that can be used to address this gap by articulating expected knowledge, skills, and competencies in measurable terms. In primary education, descriptors are useful in developing structured guidelines in creating learning standards and assessment criteria to track students' progress (Abdul Razak et al., 2023). This approach allows educators to assess students within integrated learning contexts. Descriptors further support teachers in measuring students' proficiency levels and monitor academic growth according to specific level of achievements (Gopal et al., 2023). However, there is a variety in which descriptor-based assessment systems are implemented, often lacking in conceptual clarity and methodological rigor. The implementation of descriptor-based assessments vary greatly depending on the setting in which the curriculum is being taught. Despite increasing adoption, there remains limited systematic synthesis regarding the conceptualization and evaluation of descriptor-based assessment in integrated primary education curricula. Consequently, a systematic review will help to define current methods of assessment being used with descriptors, identify trends in the use of descriptors and provide insight into challenges in the field.

Research Questions

1. To maintain clarity and methodological rigour consistent with PRISMA 2020 guidelines, the present review will aim to answer these research questions:
2. What empirical evidence (2013-2025) shows current practices and approaches used to assess integrated curricula in primary education?
3. What assessment tools, frameworks, or descriptors are commonly applied in integrated curriculum settings at the primary level?
4. What are the reported challenges of assessing integrated curricula in primary education?

Literature Review

Concept of Integrated Learning

Integrated learning has been described in various ways by scholars, but most definitions converge on the idea of connecting knowledge to real-world application. Integrated learning is the process by which learners connect the concepts they have learned to their experiences. This connection allows them to apply information and skills, either directly or indirectly, to complex issues or challenges (Huber et al., 2005). Expanding on this idea, (Matinho et al., 2022) have identified three key definitions of integrated learning that provide a deeper understanding of the concept:

1. Extent to which educators co-present knowledge, beliefs, or skills to learners.
2. Organisational structures that dictate how curricular elements are arranged.
3. Cognitive or metacognitive processes experienced internally by the student.

These definitions indicate that integrated learning works in a multi-faceted way across multiple dimensions, such as instructional delivery, curriculum design, and learner cognition. When all three areas work together, it provides greater depth and understanding among learners while also enhancing problem-solving abilities. Integrated and interdisciplinary learning approaches are widely recognized as essential to help develop 21st-century competencies, such as problem-

solving, collaboration, creativity, and STEM literacy (Chemsi et al., 2024). In recent years there has been an increase globally on reforming education systems to implement these types of learning strategies to better equip students to deal with today's world issues (Alali, 2024; Drake & Reid, 2020; González-Salamanca et al., 2020).

Importance of Integrated Curriculum in Primary Education

Recent attention has emphasized the critical role of primary education in shaping cognitive, emotional, and foundational learning developments. Despite ongoing reforms, many primary classrooms continue to employ examination-oriented teaching practices. Primary teachers then only have limited opportunity to engage their students in an environment where inquiry and discovery occur (Thanimalay & Alias, 2025). Standardized assessment processes typically reinforce a narrow focus on individual subjects with little or no encouragement of interdisciplinary learning. Students' understanding and ability to apply knowledge is hindered due to them generally expected to memorize information as opposed to connecting it to other disciplines. In contrast, integrated curriculums support a more comprehensive approach to learning through facilitating the development of holistic and relevant contexts that mirror the complexities of the real world (Akib et al., 2020; Drake & Reid, 2020; Kuwar & Acharya, 2024). Empirical studies by Ye and Xu (Ye & Xu, 2023) and González-Salamanca et al. (González-Salamanca et al., 2020) demonstrate that integrated and interdisciplinary curricula effectively develop essential 21st-century skills. These skills include the "4Cs" which are critical thinking, communication, collaboration, and creativity. These findings indicate that not only do integrated curriculums support the development of both cognitive and social competency, but they also provide a solid base upon which a student can build a successful and holistic path of academic growth. As there is growing recognition of integrated and interdisciplinary learning, educational systems are developing clear frameworks that allow educators to measure the effectiveness of these methods. Consequently, the use of descriptors in assessment plays a crucial role in this context.

Global Adoption of Integrated Curriculum

Many other countries worldwide have gradually found their pace in adopting and implementing integrated instruction in their national education systems. Integrated instruction in language, science, and technology (ILS&T) (Knoef et al., 2024; M. Rhodes et al., 2023; M. J. Rhodes et al., 2024), along with integrated STEM education (Chen et al., 2025; Costa et al., 2022; De Loof et al., 2022; Hebebcı & Usta, 2022), has been introduced worldwide. This approach utilises real-world scenarios and inquiry-based learning to boost student engagement and achievement. For example, Indonesia has implemented the Integrated Science Curriculum for science subjects, in which the development of soft skills and holistic learning has become the core guideline for implementing such curricula (Abdurrahman, 2022). While the country faces implementation challenges in integrating multiple disciplines into a cohesive curriculum, the effort to implement integrated curricula is praiseworthy. Similarly, the United States implemented integrated education in its education system through the Integrated Curriculum in both New Jersey (Harris, 2019) and New York (Marshall, 2024). Furthermore, Content and Language Integrated Learning (CLIL), which integrates language learning with subject content, is widely used in Europe and expanding globally (Banegas et al., 2020; Banegas & Hemmi, 2021; Massler et al., 2014; Yegizbayeva et al., 2025). These studies indicate that there is considerable empirical support for the benefits of integrated curricula on both academic achievement and holistic development.

Validity Challenges in Integrated Curriculum Assessment

The theoretical foundation for the assessment process of an integrated curriculum is a combination of two areas of theoretical research: (i) contemporary assessment validity theory and (ii) theories of integrated learning. Contemporary validity frameworks emphasize the importance for construct clarity, alignment between intended learning outcomes, fairness, and the implications of assessment decisions. In an Integrated Curriculum, which represents a multi-dimensional and interdisciplinarily defined set of intended learning outcomes, there exists a considerable difficulty in demonstrating sufficient construct clarity (Roehrig et al., 2021). This area of study has been demonstrated to remain under-explored (Gao et al., 2020). Therefore, robust assessments are required to effectively measure cross-disciplinary understanding (Allouch et al., 2024; Gao et al., 2020; Roehrig et al., 2021).

Integrated learning theories emphasize conceptual coherence, transfer across domains, authentic problem-solving, and the development of holistic competencies. Accordingly, it is reasonable to expect that the evaluation of students' performance will focus not only on the level of disciplinary knowledge they acquire but also on their ability to think in an integrated way, work collaboratively with peers, and apply what they have learned in practice. The method in which we assess students has a significant impact upon their learning outcomes (Mat Yusoff et al., 2023). The convergence of these perspectives reveals a critical gap. As integrated curricula are designed to produce holistic competences, the assessment strategies used to measure them frequently do so without using a valid framework for assessing interdisciplinary competence. Descriptor based models of assessment are developed to provide concrete measures of how each competency can be observed. However, their theoretical foundations, research methodology and degree to which each descriptor aligns with each curriculum objective varies across context.

Over the past several decades, scholars and policymakers have systematically examined assessment techniques for integrated curricula. However, these approaches remain fragmented and lack systematic evidence of efficacy, validated instruments, and clearly defined frameworks (Agudelo Rodríguez et al., 2024; Asunda & Walker, 2018; Burke & Lehane, 2023; Jakavonytė-Staškuvienė & Mereckaitė-Kušleikė, 2023; Pountney & McPhail, 2017; Santaolalla et al., 2020). Additionally, this misalignment between the desired outcome and what is currently implemented in classroom settings was observed not only in primary education but also in secondary and tertiary education, as evidenced by prior studies (Fielding & Regehr, 2017; Kabir, 2023; McPhail, 2018). Therefore, a systematic synthesis is needed to examine beyond descriptive mapping and instead assess how such assessment approaches conceptualise integration, operationalise criteria, and establish evidence of validity and fairness.

Methodology

This study adopted a systematic literature review. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (Moher et al., 2009) was used both as a guideline for conducting and reporting of the analysis.

Eligibility Criteria for Study Selection

This systematic literature review incorporates studies that satisfy predetermined criteria to ensure relevance and methodological rigour. Eligible articles were published in English and focused on primary education, specifically Years 1–6 or their equivalents, and addressed integrated, interdisciplinary, cross-curricular, thematic, or project-based learning approaches. Included studies examined assessment methods, tools, frameworks, descriptors, or assessment outcomes within the context of integrated curricula. To maintain relevance, the review is limited to publications from 2013 to 2025. The selection criteria included studies that had their full texts available to allow for a comprehensive analysis. Articles were excluded if the full text was inaccessible through institutional subscriptions or open-access repositories. All records available only in the form of an abstract were also removed from the final synthesis. Furthermore, all studies must provide evidence of a direct contribution toward an understanding of assessment practices, challenges, or outcomes. All articles which were irrelevant to the topic or not focused on assessment were then excluded. Structured keyword searches were used to identify relevant studies, as shown in Table 1.

Table 1: Keyword Searching

Types of searches	Keywords
Basic Search	("integrated curriculum" OR "interdisciplinary curriculum") AND ("assessment practices" OR "formative assessment") AND ("primary education" OR "elementary education")
Focus on Learning Outcome	("integrated curriculum" OR "cross-curricular learning") AND ("assessment practices" OR "student assessment" OR "authentic assessment") AND ("learning outcomes" OR "competency-based education") AND ("primary education")
Emphasis on Teacher Practices or Policy	("integrated curriculum") AND ("teacher assessment practices" OR "school-based assessment") AND ("policy implementation" OR "curriculum reform") AND ("primary education")

Search Strategy

This study utilised searches across major databases, including Scopus, Taylor & Francis Online, Springer Nature, SAGE Journals, ScienceDirect (Elsevier), ERIC (Education Resources Information Centre), and Google Scholar. In total, this search yielded 283 articles, which were then sorted through in the next step.

Selection

After the screening process to remove duplicate articles, 9 papers were identified for further study. The screening process had eliminated 44 duplicate records. After further review of the abstracts for the remaining papers, 188 were excluded as irrelevant to the topic, not focused on assessment, non-research publications, or publications dated prior to 2013. Lastly, the papers were also excluded at the eligibility stage due to no full text being available, the study not being focused on an integrated curriculum, no clear assessment tool or descriptor being discussed, and the language being other than Malay or English. Table 2 shows the inclusion and exclusion criteria for screening and the eligibility process.

Table 2: Inclusion and Exclusion Criteria for Screening and Eligibility Process

Criteria	Inclusion	Exclusion
Publication Type	Peer-reviewed journal articles, conference proceedings, official policy documents, and grey literature with educational credibility	Editorials, opinion pieces, blog posts, magazine articles
Language	English, and Bahasa Melayu	Non-English unless translated
Year Range	2013–2025	Anything published before 2013
Educational Level	Primary/Elementary education (Years 1–6 or equivalent)	Secondary, tertiary, preschool/kindergarten
Curriculum Type	Integrated, interdisciplinary, cross-curricular, thematic, project-based learning	Traditional single-subject-only curriculum
Assessment Focus	Articles that discuss assessment methods, tools, frameworks, descriptors, or outcomes in integrated curriculum	Articles that mention curriculum only, without
Relevance to RQs	Directly contributes to understanding assessment practices, challenges, or outcomes	Not related to curriculum assessment or not focused on integration

Accessibility

Full-text available

Abstract only or behind a
paywall

Meanwhile, Figure 1 shows the literature selection process following the PRISMA steps: identification, screening, eligibility, and analysis.

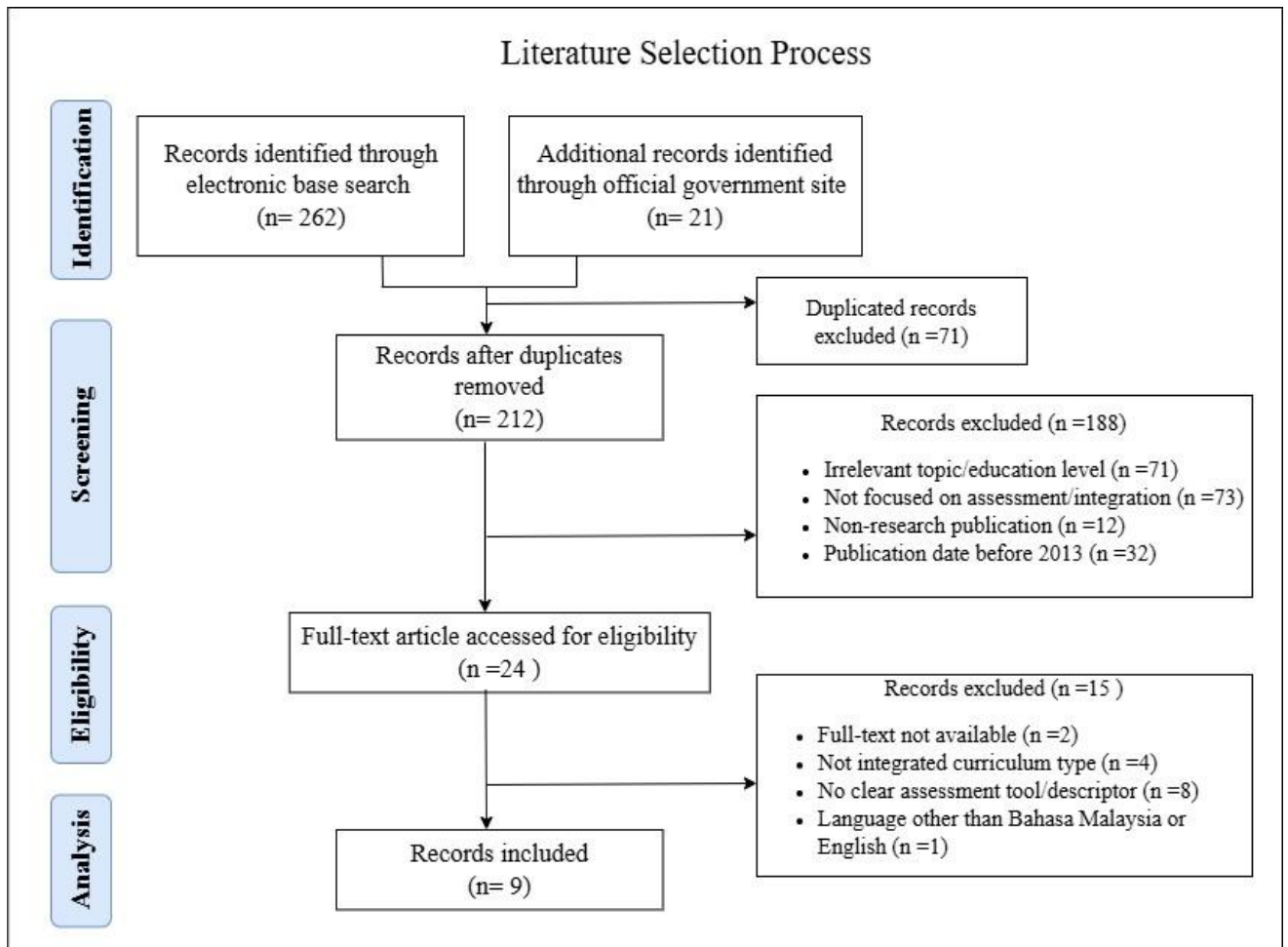


Figure 1: Literature Selection Process Following the PRISMA Steps

Results

Nine articles were analyzed and reviewed as part of this study in which all were empirical studies. While there was considerable variability in terms of publication date from 2014 to 2025, they did not appear sequentially. In addition, the majority of the studies appeared in relation to assessments of integrated curricula based upon location. North America accounts for the largest number of studies on assessments of integrated curricula, with 5 publications, followed by Europe with 2 studies, while Asia and Africa each contribute 1 study to the overall dataset. Figure 2 below represents the total number of studies in the dataset by country. In North America, the three studies that took place in the United States represented studies from three separate states namely New Jersey, New York, and a broader categorisation which encompasses the United States in general. Meanwhile, the remaining two studies are from Ontario, Canada. Table 3 depicts the full table of reviewed articles.

Contribution of Each Country

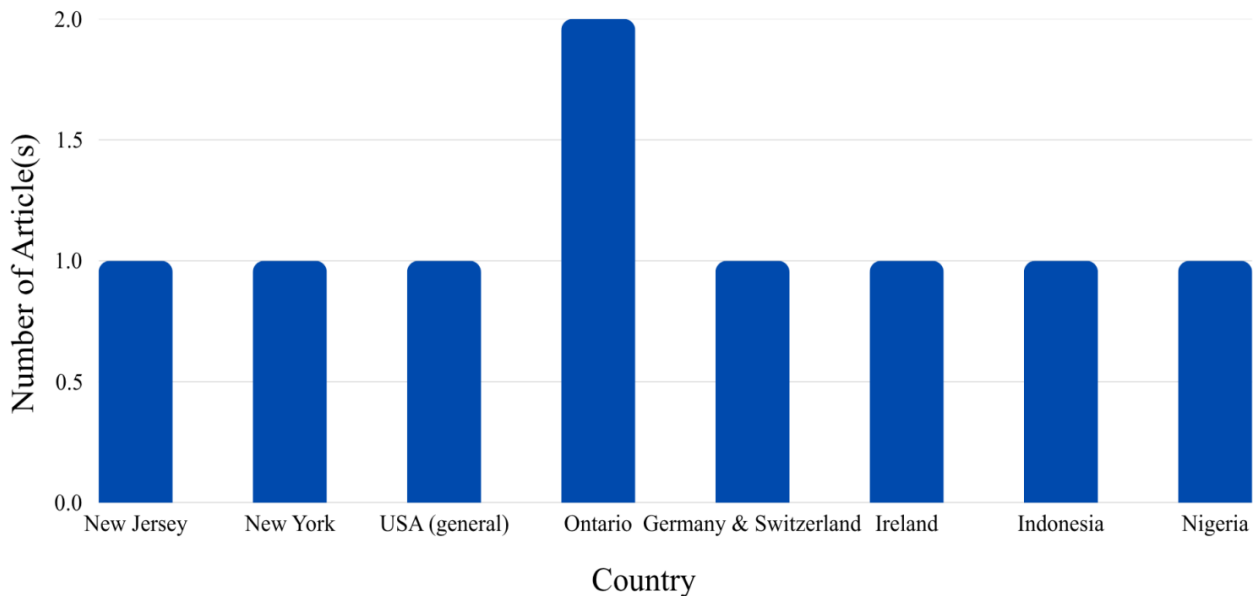


Figure 2: Contribution of Each Country

Table 3: Table of Reviewed Articles and Papers

Authors	Years	Country	Curriculum Type (Subject)	Assessment Approach	Tools/ Descriptors
DeLuca & Hughes	2014	Ontario, Canada	Integrates both academic standards and developmental goals	Participatory and Embodied Assessment, Using a Visual Indicator for both student and teacher	Oral Assessments, Physical Activities, Observational Techniques, Games and Play
Massler et al.	2014	Germany & Switzerland	Integrated Content and Language Integrated Learning (CLIL)	Dual Focus on Language and Content Assessment Scenarios	Assessment Forms, Descriptive Grid, Collaborative Assessment
Gerke	2017	Ontario, Canada	Interdisciplinary education	Diagnostic Assessments, Formative and Summative Assessments	Multimodal Presentations, Success Criteria
Harris	2019	New Jersey, United State	Integrated-Inter disciplinary Curriculum, Subject-Specific	Grade 4 PARCC (Partnership for Assessment of	Grade 4 PARCC, New Jersey Assessment of Skills and

			Curriculum	Readiness for College and Careers)	Knowledge (NJASK4)
Abdurrahman	2022	Indonesia	Integrated Science Curriculum (Science)	Outcome-Based Assessment	Curriculum Framework, Specific learning outcomes, project- based assessments, presentations, and collaborative tasks, Soft Skills Descriptor
Wan & Knobloch	2022	United States	Integrated STEM education (Agriculture, Food, and Natural Resources)	Rubric-designed (Role of Learning, Objectives, Role of STEM Usage, Present Outcomes, AFNR (Agriculture, Food, and Natural Resources), Student Thinking	Rubric Assessment
Burke & Lehane	2023	Ireland	Integrated STEM Curriculum	Technology- facilitated assessments	Online programming languages, portfolio, essays
Marshall	2024	New York, United State	Integrated curriculum (focus on sustainability theme)	project-based learning, qualitative measures (interview & focus group towards teacher)	Virtual Interviews, Virtual Focus Groups, Document Analysis, Descriptors, Transdisciplinary Approach
Adeniran et al.	2025	Nigeria	Nigeria's Basic Education Curriculum (BEC) (math & Eng)	Surveys of Enacted Curriculum (SEC) framework to measure instructional alignment (a method for evaluating how curriculum intentions translate	Survey of Enacted Curriculum (SEC), Content Topic Descriptors, Cognitive Demand Descriptors

into
classroom
practice)

Discussion

To answer Research Question 1, which examines current practices and approaches for assessing integrated curricula in primary education, this review shows that the way assessment is conducted at primary school level depends greatly upon national priorities, educational policies, and pedagogies. Three categories of assessment approaches were found namely: (i) standardised assessment models, (ii) authentic and participatory approaches, and (iii) hybrid assessment systems. Across all of the identified assessment approaches there was evidence of the use of dual methodologies of both structured and flexible assessment. Standardised assessment models, such as the Partnership for Assessment of Readiness for College and Careers (PARCC) and the Survey of Enacted Curriculum (SEC), prioritize measurable outcomes and system-level accountability. In contrast, approaches such as participatory, project-based, and technology-enhanced reflect a shift towards measuring holistic and applied learning outcomes. As evidenced from the studies included in the review, these two assessments have been implemented within different environments which are the classroom and policy levels. The findings from these studies support the notion that developing integrated curricula assessments represent a transition toward hybrid models of assessment that strike a balance between reliability and authenticity. It does so by expanding the current traditional model rather than replacing it entirely. Therefore, the overall results support the idea that flexible and hybrid forms of assessment that are developed to measure interdisciplinarity oriented and real-world applications of learning will gradually replace strictly standardised forms of evaluation in the development of integrated curriculum assessments.

The limited number of studies included in this review ($n = 9$) stems from the rigorous eligibility requirements to ensure methodological rigour and direct relevance to integrated curriculum assessment in primary education. As such, although only nine studies could be considered as part of the study base of this systematic review, these studies are geographically representative and therefore provide a useful contextual overview of how learning is assessed in different countries across the world. The diverse range of geographical regions, including North America, Europe, Asia, and Africa, thus providing a unique opportunity to examine the cross-contextual perspective among the assessment practices. Therefore, instead of establishing broad generalizations based on the identified studies, this review will focus on identifying commonalities among educational systems through identification of themes. Furthermore, the relative lack of empirical research regarding integrated curriculum assessment at the primary school level is further evidence of the under-studied nature of scholarly research focused on this area. Although the number of studies reviewed is relatively low, it does provide an opportunity to identify common themes or issues related to integrated curricula assessments that are experienced in many countries.

Global Diversity in Curriculum Integration and Assessment Models

The way integrated curricula are assessed varies widely across the globe. This difference reflects the varying educational priorities and developmental contexts found within primary education (Mitana et al., 2018). The geographic spread of integrated curriculum model

adoption around the globe is also influenced by regional variations in assessment practices. With regard to regional distributions of integrated curricular assessment studies, North America accounts for the largest number of studies on how integrated curriculums are being assessed, with five publications. The remaining literature analysed were 2 publications from Europe, then 1 publication each from Asia, and Africa. This review indicates that international differences in assessing an integrated curriculum reflect not only methodological differences, but also fundamentally different conceptualizations of learning based on that specific country.

For instance, countries like Indonesia, Ireland, and the United States utilises STEM-oriented systems to emphasise application and problem-solving to their learners. In contrast, language-based integrated curricula in Germany and Switzerland, as well as sustainability-focused curricula in the United States, adopted due to them emphasising on development of communicative competence and values-driven learning. These findings suggest that integrated curriculum assessment cannot be standardised globally. It must align with intended learning outcomes and sociocultural contexts. Educational frameworks crafted in these countries thus incorporate ideas about multiple intelligences and critical competencies to promote transformative learning (Giangrande et al., 2019). Effective curriculum frameworks emphasise flexibility to allow for diverse pedagogical approaches that cater local needs and educational reforms (Operti et al., 2018). Collectively, the studies reveal a dynamic and evolving landscape of integrated curriculum design, hence reflecting a growing emphasis on holistic education globally.

Conversely, the choice of an integrated curriculum model is also driven by policy frameworks emphasising lifelong learning and key competences. Hence, using the SEC framework, the assessment could evaluate the degree of instructional alignment in primary school education. Integrated curriculum assessment is neither uniform nor globally defined, because it is a function of the particular educational needs of each of the countries. Consequently, the diversity seen in the reviewed studies should not be viewed as an inconsistency, but instead as an adaptation of the assessment design to the specific context.

Challenges of Assessing Integrated Curricula In Primary Education

To address Research Question 2, which examines the assessment tools, frameworks, and descriptors commonly used in integrated curriculum settings, the findings reveal an integration around key shared ideas. The forms of assessment tools and frameworks available for assessing integrated curricula have been categorized into three primary areas: (i) formal frameworks for assessment, (ii) classroom-based assessment tools, and (iii) descriptor-based systems. There is now increased recognition across many types of schools and educational settings of the importance of measuring higher-order thinking, cross-disciplinary integration, and skills relevant to the world outside the classroom. This trend aligns with broader international reform agendas focused upon enhancing student 21st Century Competency Skills (Chemsi et al., 2024). Emerging evidence regarding the widespread adoption of descriptors, rubrics, and multimodal assessments in multiple countries suggests growing agreement amongst educators about the necessity to develop ways to make complex learning outcomes both observable and measurable. There will not be dispute whether the evaluation of the student's abilities is vague or biased.

Formal assessment frameworks that have been identified in this literature review that support the alignment of curriculum intentions and instructional practices include standardized assessments, such as the PARCC, and alignment-focused frameworks, such as SEC. Educational descriptors are widely employed by teachers to translate integrated learning objectives into measurable standards. For instance, learning outcome indicators and descriptive frameworks are examples of descriptive language that may be utilized to create these benchmarks so educators can evaluate consistently. However, there is currently no clear indication of whether the implementation of these assessment frameworks occur systematically or consistently (Agudelo Rodríguez et al., 2024; Burke & Lehane, 2023; Jakavonytė-Staškuvienė & Mereckaitė-Kušleikė, 2023). It highlights a significant gap that continues to exist between theoretical developments related to practical implementation of standards. Evidence further highlights this gap by demonstrating that not all learning areas can be measured equally or as effectively (Abu Kassim & Ariffin, 2025), thereby once again emphasising the difference between curriculum expectations and student's actual ability to perform in classroom. Overall, the findings suggest a common pattern exists among the use of assessment tools, yet a lack of consistency in their implementation and standardization.

Finally, to answer Research Question 3, which investigates the reported challenges associated with assessing integrated curricula in primary education, several structural barriers to implement assessments for these curricula were identified. The most significant issue is the misalignment between the objectives of an integrated curriculum that do not align with how educators currently assess student learning, specifically that continued use of the traditional high stakes standardized tests from each individual subject. While integrated learning emphasises holistic and cross-disciplinary competencies, existing evaluation systems continue to prioritise subject-specific knowledge (Marcotte & Gruppen, 2022). Thus, students will feel disconnected between the knowledge intended by the educational reforms and actual classroom practice (Roehrig et al., 2021). In addition, the complexity of designing valid and reliable assessment tools for integrated learning continues to limit widespread adoption. Educators often find it challenging to evaluate student performance in tasks that integrate multiple subject areas due to the lack of standardised criteria and appropriate scoring mechanisms in the assessment (Delahunty et al., 2021; Pappa et al., 2024). Instead, most existing instruments available focus on perceptions rather than objective outcomes (Nguyen & Thai, 2023; Roehrig et al., 2021), thereby relying heavily on subjective perceptions (Roehrig et al., 2021) that do not provide a holistic evaluation of students as a whole.

In addition to design complexity, many integrated assessments remain misaligned with existing evaluation frameworks. This dualism is an indication that there is a disconnection between curriculum intentions and the actual assessment practices in a real classroom setting. Evidence shows that measurable content mastery within subject domains continues to be prioritised over integrated learning outcomes. Thus, there exists a misalignment between the content-mastery of measurable aspects of student achievement and the development of students' ability to integrate concepts across disciplines (Roehrig et al., 2021). Effective integrated assessment requires coherent alignment of curriculum goals, teaching practices, and assessment methods. (Gleeson, 2024; Twining et al., 2021).

Teacher capacity represents a significant constraint. The effectiveness of classroom learning is primarily determined by how well the teacher can adjust his/her instruction to accommodate different levels of student abilities (Damanhuri et al., 2025). This underscores the central role of teachers in the educational context. Existing literature demonstrates that teachers are

essential in implementing classroom assessments that enhance students' learning and understanding (Mat Yusoff et al., 2023), which makes them critical to the process of integrating curriculum assessments. While this study was conducted at the secondary level, the findings of this study provide valuable information regarding teachers' beliefs about assessment that can be used as a guide to develop assessment procedures across all levels of education, including primary education. However, the implementation of integrated assessment requires advanced assessment literacy, pedagogical flexibility, and interdisciplinary understanding among the educators to successfully implement the assessments. Unfortunately, many teachers do not receive adequate training in those skills (Matsumoto-Royo & Ramírez-Montoya, 2021). This deficiency complicates the teacher's evaluation of students and therefore are unable to evaluate fairly (DeLuca et al., 2019; Lo & Leung, 2022).

Successful integration of curriculum assessments relies upon both the development of appropriate tools and frameworks for curriculum assessment, as well as sustained professional development and institutional support. Even when teachers understand theory associated with assessment, that knowledge does not always translate into classroom practice due to teachers tend to apply assessment-for-learning strategies inconsistently (Pang, 2022). Therefore, there is a significant need to develop robust systems and guidelines to evaluate students' academic performance and proficiencies within integrated curricula (Bereczki & Kárpáti, 2021). As such, issues like inadequate teacher preparation, insufficient training, a lack of validated techniques, and inconsistencies in the alignment between curriculum design and methods of evaluation need to be adequately addressed to ensure effective teaching is not hindered. Ultimately, structural misalignments, methodological limitations, and challenges related to teachers' implementation of integrated curriculum assessments have hindered the efficient and successful implementation of assessments that were supposed to provide comprehensive, interdisciplinary assessments of student learning within primary schools.

Findings from this review indicated that the field is evolving and will continue to do so. While there is increasing momentum toward adopting holistic and integrated forms of assessment in education, the increased emphasis appears to be limited by the absence of coherent systems, validated assessment instruments, and supportive policies. Strengthening connections among curriculum, pedagogy, and assessment systems will be essential for future development. It is the next actionable step. Future progress will depend on bridging the gap between theoretical or conceptual innovations, and practical applications through robust assessment frameworks, enhanced teacher training, and aligned policy with new technology designed to support improved assessment.

Conclusion

In conclusion, this review provides a critical analysis on the subject of curriculum integration and related assessments throughout diverse geographic locations around the world implemented over time. This study also shows how the global landscape of curriculum integration and associated assessment is changing to better suit current competency skills and knowledge proficiency. While there were differences in implementation across countries, educational policies, subjects taught, and teaching methods, they collectively indicated a developing international consensus. Additionally, a consistent trend was identified through this analysis. Integrated assessment models developed from integrated curricula are increasingly seen as viable tools for promoting students' holistic development and 21st-century learning competencies, particularly at the primary education level.

This growing implementation of integrated assessments represents an ongoing transformation toward less rigid evaluation, moving away from traditional subject-based assessment in favor of student-centered approaches. However, it is important to emphasise that there is no single universal method or one-size-fits-all strategy for implementing integrated assessments across all educational systems worldwide. Each country has unique social, cultural, and economic factors that affect the type of curriculum and the corresponding assessment process used within its system. It's what fits the current community needs. As a result, national curricula and assessment practices are tailored to meet each country's contextual objectives, ensuring assessments align with the skills required by that nation.

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