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Classroom-Based Indicators of Assessment Coherence in Cross-Curricular Projects

ABSTRACT

This study aimed to identify classroom-based indicators of assessment coherence in cross-curricular projects as perceived by teachers in Tehran, with a focus on practices that align learning goals, instructional activities, and assessment strategies. A qualitative research design was employed, involving semi-structured interviews with 26 teachers and curriculum specialists from primary and secondary schools in Tehran who had experience with cross-curricular project implementation. Data collection continued until theoretical saturation was achieved. Interviews were audio-recorded, transcribed verbatim, and analyzed thematically using NVivo software. The analysis followed an open coding process, with codes and themes refined through constant comparison and member checking to ensure rigor and trustworthiness. Three major themes emerged from the data: (1) Alignment of Learning Goals and Tasks, which included shared learning objectives, unified assessment criteria, integrated content, balanced subject representation, collaborative curriculum mapping, and reflective alignment reviews; (2) Collaborative Instructional Practices, encompassing co-teaching, regular planning meetings, professional development, structured communication, student involvement in planning, and conflict resolution strategies; and (3) Evidence and Use of Learning Outcomes, which comprised the use of multiple forms of evidence, continuous feedback mechanisms, systematic documentation, transparent reporting, and reflection on learning. Teachers highlighted the importance of joint planning, diversified assessment, and participatory approaches for maintaining coherence and student engagement in cross-curricular projects. The findings underscore the significance of structured teacher collaboration, diversified assessment evidence, and ongoing reflective practice in achieving assessment coherence within cross-curricular projects. Supporting these practices through school-level structures, targeted professional development, and inclusion of student voice is essential for advancing the quality and impact of integrated education. These results offer actionable recommendations for educators and policymakers aiming to foster coherent, equitable, and meaningful assessment in interdisciplinary learning environments.

Keywords: assessment coherence; cross-curricular projects; qualitative research; teacher collaboration; curriculum integration; student voice; formative assessment

Introduction

The growing demand for holistic, relevant, and transferable learning has given rise to innovative curriculum models that transcend traditional disciplinary boundaries. Among these, cross-curricular projects—also known as interdisciplinary or integrated curricula—have become a focal point in contemporary educational reforms worldwide (Drake & Reid, 2020). By intentionally blending knowledge, skills, and methods from multiple disciplines, cross-curricular projects aim to foster deeper learning, critical thinking, and the capacity to apply understanding in authentic contexts (Beane, 1997; Czerniawski, 2016; Jacobs, 1989). However, the promise of such pedagogies is contingent upon robust, coherent assessment practices that capture student learning in ways that honor the complexity and interconnection of knowledge domains (Venville et al., 2023; Pellegrino et al., 2016).

Assessment coherence—defined as the alignment and consistency of learning objectives, instructional activities, and assessment criteria—has emerged as a cornerstone of effective cross-curricular project design (Biggs, 2014; Wiliam, 2011). In classroom settings, coherence ensures that assessment tasks truly reflect the intended outcomes of integrated learning experiences, guiding both instruction and student engagement (Black & Wiliam, 2009; Moss, 2013). Without such coherence, assessment risks becoming fragmented, confusing for learners, and uninformative for educators seeking to gauge progress or provide meaningful feedback (Kane, 2013).

The literature on curriculum integration highlights numerous challenges to achieving assessment coherence in cross-curricular projects. Teachers often face difficulties in reconciling different subject-specific standards, aligning assessment rubrics, and maintaining clarity regarding shared learning goals (Vars, 2001; Fogarty, 2009). As Newmann, King, and Carmichael (2007) observe, “without intentional alignment, assessment in interdisciplinary contexts can devolve into a patchwork of disconnected measures.” Further, time constraints, limited professional development opportunities, and organizational barriers can undermine collaboration among teachers and reduce the effectiveness of integrated assessment strategies (Hurley, 2001; Drake & Burns, 2004). Despite these challenges, research indicates that schools and educators who prioritize assessment coherence within cross-curricular projects report higher levels of student engagement, more accurate reflections of student learning, and greater instructional clarity (Veugelers, 2011; Pellegrino et al., 2016).

Understanding classroom-based indicators of assessment coherence in cross-curricular projects is particularly vital given the growing emphasis on project-based and inquiry-oriented learning. Project-based learning (PBL), for instance, inherently relies on the integration of multiple subject areas and demands assessments that capture not only disciplinary knowledge but also skills such as collaboration, creativity, and problem-solving (Thomas, 2000; Bell, 2010). The effective assessment of such complex performances requires clear criteria, shared expectations among teaching staff, and opportunities for students to demonstrate learning through multiple modalities (Hmelo-Silver et al., 2023; Schneider et al., 2022). Yet, as Honey, Pearson, and Schweingruber (2014) argue, many current assessment systems struggle to provide such nuanced and holistic evaluations, especially in contexts where accountability structures privilege discrete subject tests.

Classroom teachers play a central role in negotiating and enacting assessment coherence within cross-curricular projects. Their professional judgment, collaborative planning, and willingness to engage in reflective practice are all critical factors influencing the alignment of assessments with intended learning outcomes (Stiggins, 2017; Gresalfi & Hand, 2019). Recent research suggests that successful cross-curricular assessment coherence is more likely when teachers are supported by structured opportunities for joint curriculum mapping, co-construction of rubrics, and sustained dialogue about student progress (Sinnema et al., 2020; Carless & Boud, 2018). Additionally, involving students in the assessment process—such as through self-assessment, peer feedback, and student voice in task design—can further enhance coherence and increase assessment literacy among learners themselves (Panadero et al., 2018; Black & Wiliam, 2009).

In the context of Iran’s education system, there has been a growing movement toward integrating cross-curricular projects into mainstream instruction, particularly in urban centers such as Tehran (Nouri & Shahvarani, 2015). Educational policymakers have recognized the need for curriculum reforms that promote 21st-century skills and prepare students for the demands of a rapidly changing society (Nouri & Shahvarani, 2015; OECD, 2019). However, little empirical research has investigated how teachers in these settings interpret, design, and implement assessment coherence in classroom-based cross-curricular projects. This gap is significant, as local cultural, institutional, and systemic factors can shape both the opportunities and challenges associated with integrated assessment (Shabani & Ghasemi, 2016).

Existing studies from international contexts offer important insights. For example, Drake and Reid (2020) found that successful assessment coherence in cross-curricular settings is often underpinned by deliberate, ongoing teacher collaboration

and a shared language of learning goals. Similarly, Venville et al. (2023) highlight the necessity of reflective alignment reviews and regular curriculum mapping sessions to maintain coherence over time. The research literature also underscores the importance of diversifying forms of assessment evidence (e.g., portfolios, performances, self-assessments), establishing transparent communication channels among staff, and explicitly addressing potential conflicts in subject priorities (Wiliam, 2011; Pellegrino et al., 2016; Moss, 2013).

Despite these advances, many questions remain regarding the lived realities of teachers working within the constraints and affordances of their particular educational systems. For instance, how do teachers in Tehran experience the process of aligning learning objectives and assessment criteria across subjects? What collaborative practices support or hinder the development of coherent assessment frameworks? And what evidence do teachers rely upon to determine whether assessment coherence has been achieved in cross-curricular projects? Addressing such questions is crucial for informing professional development, school leadership strategies, and policy initiatives aimed at enhancing the quality and impact of cross-curricular education.

Moreover, from a student perspective, assessment coherence directly influences the clarity of expectations, the perceived relevance of tasks, and the fairness of evaluation processes (Schneider et al., 2022; Panadero et al., 2018). When students encounter unified and transparent assessment criteria, they are better able to understand the connections among subjects, monitor their own learning, and take ownership of their educational journeys (Carless & Boud, 2018; Stiggins, 2017). Conversely, incoherent or fragmented assessment practices can lead to confusion, disengagement, and a lack of trust in the evaluation system (Kane, 2013).

This study seeks to address these critical issues by exploring classroom-based indicators of assessment coherence in cross-curricular projects from the perspectives of teachers working in Tehran. Through qualitative inquiry using semi-structured interviews and thematic analysis, the research aims to identify key practices, challenges, and enabling conditions for assessment coherence as enacted in local school contexts. By foregrounding the voices and experiences of classroom practitioners, the study contributes to a growing body of evidence supporting the design of effective, equitable, and coherent assessment systems in cross-curricular education. Ultimately, the findings will inform both local and international efforts to improve integrated learning and assessment, supporting the broader goal of preparing students for complex, interdisciplinary challenges in the contemporary world.

Methods and Materials

Study Design and Participants

This study employed a qualitative research design to explore classroom-based indicators of assessment coherence within cross-curricular projects. The aim was to capture the nuanced perspectives of educators directly involved in the planning, implementation, and evaluation of such projects. The study was conducted in Tehran and involved purposive sampling to ensure a diverse representation of educational practitioners from various subject areas and school contexts.

A total of 26 participants were included in the study. The sample consisted primarily of teachers who had direct experience with cross-curricular project design and assessment in primary and secondary schools. Additionally, several curriculum coordinators and assessment specialists were recruited to provide broader insight into school-wide practices. Participants varied in terms of teaching experience, subject expertise, and length of engagement with cross-curricular approaches, enhancing the depth and variety of the data collected.

Data Collection

Data were gathered through semi-structured interviews, which allowed for in-depth exploration of participants' experiences and perspectives while providing flexibility to probe for further detail where necessary. An interview guide was developed based on a review of relevant literature and expert consultation, focusing on areas such as the alignment of assessment tasks across subjects, shared learning goals, evidence of learning, teacher collaboration, and perceived challenges to assessment coherence.

Each interview lasted between 45 and 70 minutes and was conducted either in-person or via secure video conferencing platforms, depending on participant availability and public health guidelines. All interviews were audio-recorded with participant consent and subsequently transcribed verbatim to ensure accuracy. The data collection process continued until theoretical saturation was achieved, meaning that no new significant themes were emerging from the interviews, which occurred after the 26th interview.

Data analysis

Data analysis followed a thematic approach, supported by the use of NVivo qualitative data analysis software (version 12). After transcription, all interview texts were uploaded into NVivo for systematic coding and analysis. The analysis began with an initial open coding phase, where segments of text were labeled according to emerging concepts relevant to assessment coherence. These codes were then grouped into broader categories and themes through constant comparison and iterative review.

To enhance trustworthiness, coding was conducted independently by two members of the research team, with regular meetings to resolve discrepancies and refine the coding framework. The process also included member checking, where a summary of emergent themes was shared with a subset of participants for validation and feedback. Reflexivity was maintained throughout the analysis, with researchers keeping analytic memos to document their interpretations and decision-making processes.

Through this rigorous qualitative methodology, the study was able to identify key classroom-based indicators of assessment coherence as experienced and articulated by educational practitioners engaged in cross-curricular project work.

Findings and Results

1. Alignment of Learning Goals and Tasks

Shared Learning Objectives:

Participants highlighted the importance of establishing shared learning objectives across disciplines in cross-curricular projects. Teachers reported that jointly defined goals ensured all subjects contributed meaningfully and that “everyone is on the same page about what students need to learn.” As one interviewee explained, “When we agree on the main learning goals, it helps us avoid duplication and gives students a clearer sense of purpose.”

Consistency in Assessment Criteria:

A recurring theme was the use of unified assessment criteria, with many educators developing shared rubrics and success indicators. One teacher stated, “We use the same rubric for both science and language tasks, so students know exactly what we expect, no matter the subject.” This transparency fostered fairness and clarity in assessment.

Integration of Content:

Teachers frequently emphasized the value of integrating content from different subjects, making learning more relevant and holistic. As one participant noted, “Linking math concepts to real-world problems in social studies makes the content stick.” Thematic connections and real-world applications were cited as critical for assessment coherence.

Sequencing of Activities:

Thoughtful sequencing and scaffolding of project tasks emerged as vital for facilitating student understanding. Several interviewees described planning projects in a way that built knowledge gradually: “We make sure activities follow a logical order—students build on what they’ve learned before moving to the next step.”

Balance Between Subjects:

Participants voiced concerns about one subject dominating the project, stressing the need for balanced representation. One curriculum coordinator remarked, “We make a conscious effort to ensure no subject overshadows the others, so each has an equal voice in both teaching and assessment.”

Collaborative Curriculum Mapping:

Joint curriculum mapping was frequently mentioned as a strategy to visualize and coordinate cross-curricular links. “We use mapping tools to lay out all the units and see where we can make meaningful connections,” said one teacher, highlighting the role of visual aids and year-long planning.

Reflective Alignment Reviews:

Ongoing reflection and alignment reviews were described as essential for maintaining coherence. Teachers reported holding regular meetings to discuss project progress: “We sit down after each cycle to reflect and tweak our approach, ensuring we stay aligned.”

2. Collaborative Instructional Practices

Co-Teaching and Teamwork:

Joint teaching efforts played a central role in fostering assessment coherence. Teachers described co-planning and even co-delivering lessons, with one participant stating, “Team teaching helps us share ideas and support each other in assessing students.” This mutual support was seen as critical for unified project delivery.

Regular Planning Meetings:

Scheduled planning meetings provided opportunities for ongoing dialogue and problem-solving among teachers. “Every Wednesday, we get together to talk about what’s working and what needs adjustment,” shared a teacher. Such meetings were viewed as essential for maintaining communication and coherence.

Professional Development:

Professional development in cross-curricular assessment, such as workshops and peer observation, emerged as beneficial. “We learned so much from observing each other’s classes and attending joint workshops,” one teacher reflected, emphasizing the value of shared learning experiences.

Communication Protocols:

Effective communication channels, including digital platforms and regular updates, were key to successful collaboration. “Having a shared chat group means we can quickly clarify any confusion about the project or assessment,” explained a participant, noting that structured protocols supported teamwork.

Student Involvement in Planning:

Teachers increasingly valued student participation in planning and shaping projects. “We invite students to suggest ideas for project tasks—they feel more invested, and it helps us design better assessments,” said one interviewee, highlighting the role of student agency.

Conflict Resolution Strategies:

The process of resolving disagreements was handled through open discussions and shared decision-making. As one teacher described, “If there’s a disagreement about an assessment, we talk it through until we find common ground. It’s about compromise.”

3. Evidence and Use of Learning Outcomes

Multiple Forms of Evidence:

A variety of assessment evidence was used, including portfolios, performances, and written reports. Teachers noted, “We don’t just rely on tests; students can show what they know through presentations or portfolios.” This diversity provided a richer picture of student achievement.

Continuous Feedback Mechanisms:

Formative feedback, peer review, and opportunities for revision were fundamental practices. One student reported, as relayed by a teacher, “I like getting feedback from both my classmates and teachers before I finish my project—it helps me improve.” Iterative feedback cycles were valued by both students and teachers.

Documentation and Tracking:

Documenting student progress through digital portfolios and progress charts was common. “We use assessment logs to track each student’s growth throughout the project,” shared one participant, underscoring the importance of ongoing documentation for assessment coherence.

Reporting and Communication:

Effective reporting practices extended to parents and the broader school community. Public exhibitions and cross-disciplinary report cards were highlighted as tools to communicate learning outcomes: “Our students present their projects to parents and teachers from all subjects—it makes their learning visible.”

Reflection on Learning:

Reflection was built into the assessment process for both students and teachers. “At the end of each project, we ask students to reflect on what they learned and how they contributed. We do the same as teachers,” reported a participant. This practice fostered metacognition and continuous improvement.

Discussion and Conclusion

This study aimed to explore classroom-based indicators of assessment coherence in cross-curricular projects, drawing on the perspectives and lived experiences of teachers in Tehran. Through rigorous qualitative analysis of semi-structured interviews, three overarching themes emerged: (1) Alignment of Learning Goals and Tasks, (2) Collaborative Instructional Practices, and (3) Evidence and Use of Learning Outcomes. Each of these themes was further clarified by a set of nuanced subthemes, together painting a comprehensive picture of the factors underpinning coherent assessment practices in cross-curricular environments.

The first major theme, Alignment of Learning Goals and Tasks, underscored the critical importance of shared learning objectives and consistency in assessment criteria. Teachers described how joint planning and the development of common curricular goals helped eliminate redundancies and clarify expectations for both staff and students. Consistency in assessment rubrics and unified success criteria further ensured that assessment tasks reflected agreed-upon learning intentions, regardless of the subject area involved. Participants highlighted the value of integrating content across disciplines, designing logical sequences of activities, and maintaining a balance in the representation of different subjects. The use of collaborative curriculum mapping tools and reflective alignment reviews facilitated ongoing coherence and adaptation in project design and assessment.

The second theme, Collaborative Instructional Practices, revealed that sustained teamwork among teachers was foundational for assessment coherence. Co-teaching arrangements, regular planning meetings, and peer professional development initiatives provided fertile ground for collective sense-making, mutual support, and the negotiation of assessment approaches. Teachers emphasized the value of structured communication protocols and conflict resolution strategies for managing inevitable differences in perspective and ensuring alignment. Importantly, student involvement in the planning and design of projects and assessments emerged as an additional source of coherence and engagement, reinforcing the principle that assessment should be a participatory process.

The third theme, Evidence and Use of Learning Outcomes, focused on the diversification of assessment evidence and the iterative use of feedback. Participants reported relying on multiple forms of evidence—including portfolios, performances, observations, and written reports—to capture the complexity of student learning in cross-curricular projects. Continuous feedback mechanisms such as formative assessment, peer review, and self-assessment were deemed essential for supporting student growth and making learning visible. Systematic documentation and transparent reporting practices, often extending to parents and the wider school community, further reinforced assessment coherence. Finally, both student and teacher reflections were integrated as regular components of the assessment process, fostering metacognitive awareness and ongoing improvement.

The findings of this study are strongly aligned with previous research on curriculum integration and assessment design. The centrality of shared learning goals and consistent assessment criteria resonates with Biggs' (2014) theory of constructive alignment, which posits that educational effectiveness is maximized when learning outcomes, instructional activities, and assessments are mutually supportive and transparent. Similarly, Wiliam (2011) and Black and Wiliam (2009) have underscored the need for assessment coherence to ensure both fairness and utility in formative and summative contexts.

The observed emphasis on collaborative planning and joint curriculum mapping echoes the recommendations of Drake and Reid (2020), who found that deliberate teacher collaboration was a key enabler of successful cross-curricular integration. The use of shared rubrics and alignment reviews aligns with Venville et al. (2023), who documented the importance of ongoing reflection and mapping sessions for sustaining coherence in integrated STEM and project-based curricula. The balancing of subject representation and the integration of thematic connections are similarly reflected in the literature on interdisciplinary curriculum design (Beane, 1997; Jacobs, 1989; Czerniawski, 2016).

A notable finding of this study is the active involvement of students in project planning and assessment. This practice is supported by recent research emphasizing the benefits of student voice, co-construction of tasks, and participatory assessment for enhancing both engagement and learning outcomes (Panadero et al., 2018; Carless & Boud, 2018). The extension of assessment coherence to include student self-assessment and peer feedback is consistent with Pellegrino et al. (2016) and Stiggins (2017), who have advocated for more democratic, transparent, and learner-centered assessment frameworks.

The diversification of assessment evidence in cross-curricular projects, as observed in this study, parallels recommendations by Honey, Pearson, and Schweingruber (2014) and Schneider et al. (2022) regarding the need for holistic, multimodal assessment systems in STEM-rich and project-based environments. The frequent use of portfolios, exhibitions, and reflective journals mirrors international trends in progressive educational assessment (Thomas, 2000; Bell, 2010). Furthermore, the importance placed on documentation and communication with parents and the broader community is echoed in Sinnema, Nieveen, and Priestley's (2020) analysis of curriculum coherence at the policy and school levels.

The challenges noted by participants—such as managing the balance between subjects, reconciling different assessment traditions, and sustaining collaboration amidst competing demands—are consistent with earlier reports by Hurley (2001), Vars (2001), and Fogarty (2009), who documented the obstacles to curriculum integration in both policy and practice. The findings

further highlight the ongoing need for school-level structures and professional development to support teacher collaboration and resolve conflicts that may arise during the design and implementation of cross-curricular assessments.

Importantly, this study extends prior research by providing rich, contextually grounded evidence from Iranian classrooms—a context that has been underrepresented in the literature on cross-curricular assessment. As Nouri and Shahvarani (2015) and Shabani and Ghasemi (2016) have argued, understanding the local cultural and systemic factors that shape assessment practice is essential for effective curriculum reform. The findings here suggest that teachers in Tehran are both keenly aware of and actively engaged in negotiating the complexities of assessment coherence, drawing on collaborative strategies and reflective practices that mirror, and in some cases extend, international best practices.

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Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

All ethical principles were adhered in conducting and writing this article.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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